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IT is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious Art; for the disciplined ranks of a distinguished Profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb. . . . . .

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

AUG. 21, 1901.
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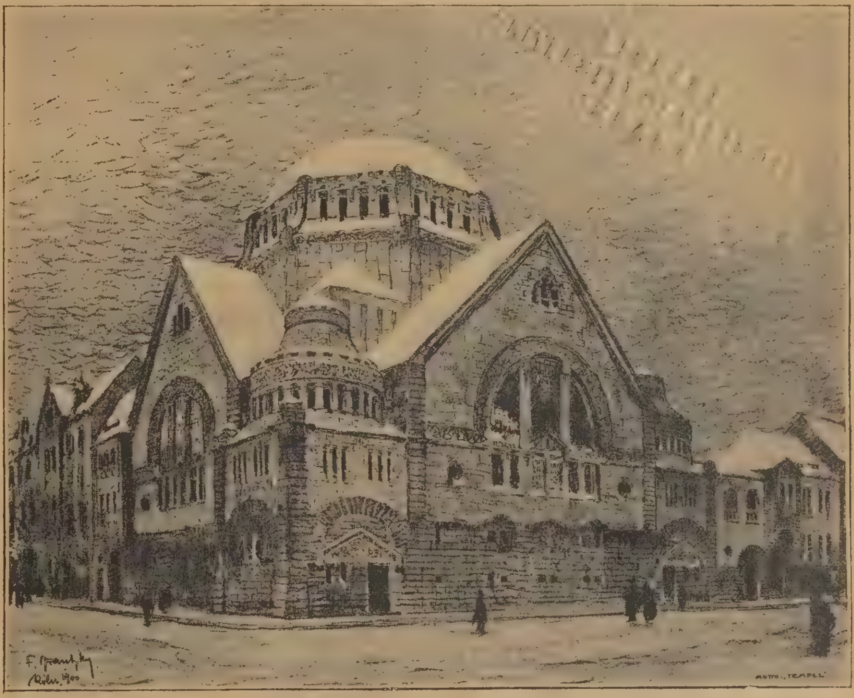
An Architectural Causerie.

Conclusive. MR. LEONARD STOKES, as one of the executors of the late Mr. Brydon, has come forward with facts which completely nullify the contention that the Government did the right thing when they decided to complete the new Government offices themselves. This view of the case was voiced by the "A.R.I.B.A." who wrote to the "Times" expressing the conviction that the appointment of an architect of note to complete the building would be detrimental to the best results, as he would find it "irresistible to impress his own personality on the superstructure, and we should not then have the building as it would have been carried out by the late Mr. Brydon himself": it being further contended that the officials of the Government were not open to the same temptation, and consequently fitter persons to superintend the work. There is doubtless *some* measure of truth in this argument, but the whole question depends on what was the actual condition of the drawings at the time of Mr. Brydon's lamented death: this is the crux, and the statements made by Mr. Stokes at this juncture conclusively prove that the opinion held by "A.R.I.B.A." is entirely erroneous. Mr. Stokes says that the drawings when handed over to the Office of Works were but incomplete drawings for the carcase of the building. Two-fifths of the fees due to Mr. Brydon on the whole building were paid for these drawings; therefore Mr. Stokes reasonably considers that three-fifths of the works which Mr. Brydon was employed to do remains to be done by someone. For various reasons Mr. Brydon had been instructed to obtain tenders for the carcase only of his building first, leaving all finishing for a second contract; but the drawings for this first contract even were not completed when he died. Mr. Stokes, while expressing the desire that the building might be erected without variation from the original design, says that this is practically impossible, "as enough evidence of his (Mr. Brydon's) intentions does not exist, so that someone must take up the work and give the five or six years of constant attention to it which Brydon would have given had he lived." There are a number of ½in. scale details, but many of these were hurriedly made to help the quantity surveyors to obtain a tender, and Mr. Brydon himself would be the first to admit that these drawings required very careful reconsideration and revision. Moreover, Mr. Stokes asks whether it is wished that "this hurried work (necessarily so at this stage under modern conditions) should be perpetuated, or whether one would not rather see it revised and amplified by some sympathetic hand?" Again, who is to see to the second contract and design, the finishing and fitting up of this huge carcase? Surely an architect of standing? "Brydon had personal friends in the Office of Works for whom he had the greatest regard, and so have I, and yet I happen to know that the Office of Works is about the last office he himself would have gone to to finish his great work for him." The last remark carries a world of meaning, and yet Mr. Akers-Douglas, in order to effect "a considerable saving," decides to place the work of completion in the hands of the Government officials—that is to say, in the hands of Sir John Taylor and Mr. Henry Tanner. We think from what has been stated that it is now very clear that a gross error has been made: but even now it is not too late to rectify it.



DESIGN FOR THE SYNAGOGUE AT DÜSSELDORF. F. BRANTZKY, ARCHITECT.

Modern German Architecture. WE publish this week two illustrations of modern German architecture, one on this page and the other on page 9. The competition design for the synagogue at Dusseldorf exhibits many of the good qualities to be seen in the work of some of the best German architects, though it also possesses the vagaries which have given rise to the question, "Is architecture gone mad in Germany?" That there is justification for this doubt, one needs only to inspect the designs published in the German architectural papers, the dominant feature of which designs seems to be an unhealthy craving after novelty. Carving is applied in an amazing manner, the scale being appallingly wrong; decoration is spread over the walls regardless of restraint or propriety; and a hundred-and-one novelties are introduced, not because they are the logical outcome of requirements or because of their intrinsic fitness, but by reason of the insensate craving of men who are architectural sots. Yet it would be unfair to range all under this category, for there are among the German architects men of large calibre, with ideas born of to-day which they are capable of expressing with commanding and admirable skill. Of a truth our own architecture can bear criticism, and it is open to question whether it is not better to have a wild new fancy than a conglomerate of dead dulness and incompetence; and it needs careful discretion not to fail to appreciate the merits of a new conception when shrouded in a style to which criticism is unaccustomed.

The New Cathedral at Westminster. COLUMNS of particulars have already been published on the new Roman Catholic Cathedral at Westminster, but in order to appreciate the magnitude of the structure one needs to see it. At the present time Mr. Bentley's cathedral is very far from being complete, though we understand that the inaugural services are to be held on the Feast of St. Peter and St. Paul in June next. The outside, with the exception of the great tower, is practically finished, but inside much remains to be done, and the peeps one obtains of superb marble columns enveloped in boarding only tends to heighten the contrast between the finished and the unfinished. Great semicircular brick arches rise from the high piers, and above them the domes extend, giving to the whole building a splendid feeling of spaciousness. The lighting is not "dim religious," but floods in through the tinted glass set high up in the walls, such abundance evidently being provided in order to enhance the mosaic and marble which will eventually constitute the lining of the building. Immense sums of money have already been spent on this great cathedral, more than £50,000 having been paid for the site, but when the decoration is reached the cost will be enormous, for the design has been fashioned to give the greatest effect to the Roman ritual, and this effect is to be heightened by a gorgeous display of colour and gold on the walls. It is impossible to judge the building in its present incomplete state, but we certainly congratulate Mr. Bentley on the great breadth of effect which his cathedral possesses.

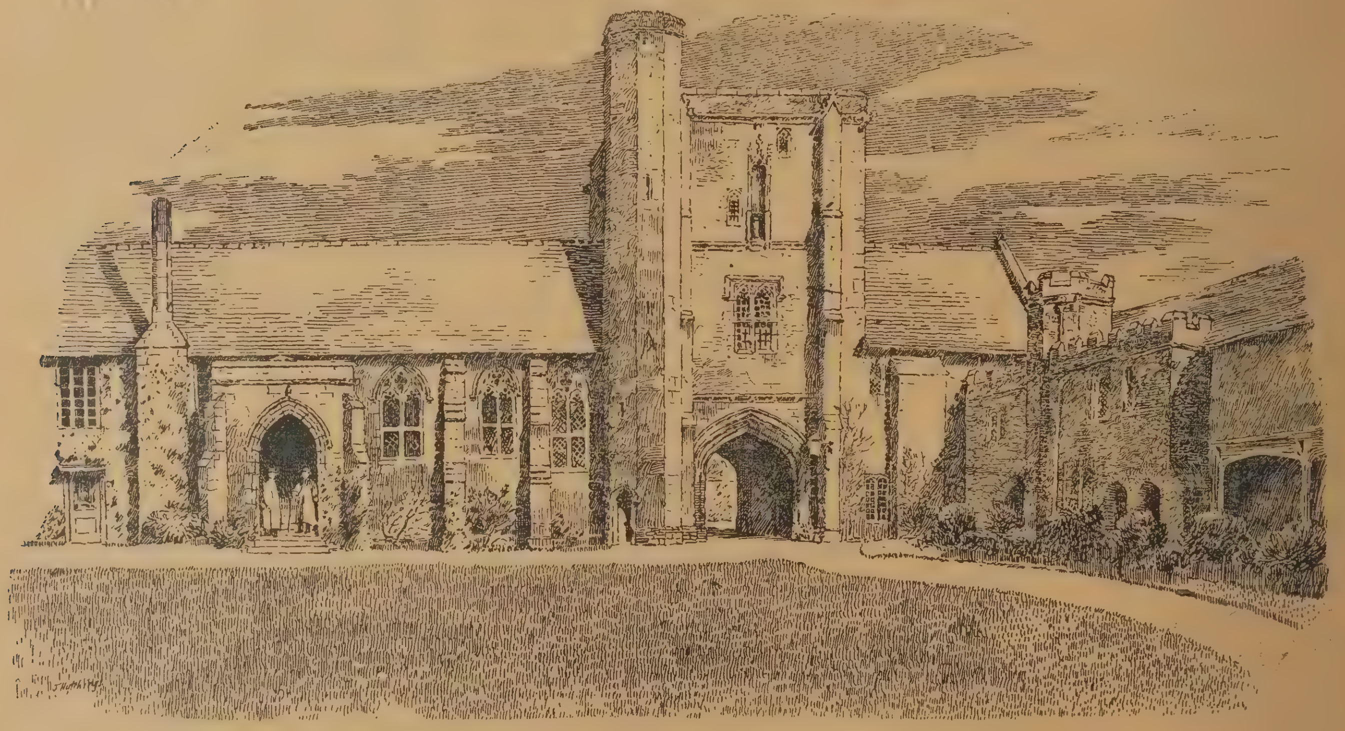
THE HOSPITAL OF ST. CROSS.

By JOHN HUTCHINGS, A.R.I.B.A.

PERHAPS few persons, save the professional gentry of the road, are aware that the bona-fide traveller is entitled by virtue of a very ancient charter to demand at the porter's lodge of the venerable Hospital of St. Cross the traveller's dole, consisting of a horn of ale and a piece of bread. Such, however, is the case, and this ancient custom has survived, together with many others, more showy perhaps, but also of more questionable value.

St. Cross, about a mile from the cathedral city of Winchester, the old-world capital of England, is situated in the luxuriant meadows through which the fertilising waters of the Itchen wander, now this way and now that; and as if loth to hurry through such verdant pastures it parts several times into dual streams, which pursue their several ways only to merge again into a single channel lower down the valley.

This hospital, intended for the support of aged and deserving poor, dates from the twelfth century, and is interesting as an attempt to grapple with a problem that effectually baffles our most able legislators and politicians to-day. Owing to the growing socialism of the times, or to the magnitude of the evil, the difficulty of providing a fund for the superannuation of the poor has been raised beyond the individual and is now regarded as the duty of the State. Such was not the case in the Middle Ages. Then Christianity was a living vital reality, and the Church insisted that every indigent brother, be he nobleman or slave, having once been admitted to the true fold, was in the eye of the Supreme of equal value. And though the socialistic organisation of the early Church was not considered practicable, next to faith and generosity to the Church the giving of alms for the alleviation of suffering and the assistance of the needy was regarded as the highest virtue. Chivalrous knights paraded the country succouring the helpless and maintaining some semblance of law, order and justice; the monasteries had their guest chambers and infirmaries and denied admittance to none; the lord of the manor, though his hospitality was to be accepted with caution, kept open house; and pious men and women devoted vast sums of money to the relief of distress and the building of churches and monasteries.



THE QUADRANGLE, HOSPITAL OF ST. CROSS, WINCHESTER. DRAWN BY JOHN HUTCHINGS, A.R.I.B.A.

This spirit of responsibility for the welfare of the unfortunate, perhaps combined with a desire to atone for past shortcomings, was responsible for the existence of the Hospital of St. Cross. This institution was founded as far back as 1132 by De Blois, Bishop of Winchester, grandson of the Conqueror and half-brother to King Stephen, who commenced the present fine Transitional Norman church, together with a number of lodgings and other apartments which have long since perished or been replaced by later erections. The founder's object was to provide homes and maintenance for thirteen poor men "so decayed and past their strength that without charitable assistance they cannot maintain themselves, who shall have continual habitation in the hospital, and be provided with proper clothing and beds suitable to their infirmities." Their daily allowances were specified in detail in the original charter, and a stipend was provided for the master and other officials. Moreover 100 neighbouring poor were also to be entertained to dinner every day in the hall, named in consequence hundred-mennes-hall, and the surplus of the revenues was directed to be expended in furnishing doles for other indigent persons.

It is curious to observe that each of the inmates was to receive 1½ gallons of beer daily, and the hundred poor 3 quarts each, and on certain festivals more liberal quantities of food and drink were to be dispensed.

The establishment was to be maintained by the emoluments of several rectories and by pensions to be contributed by others; and in Wykeham's time the annual receipts amounted to between £300 and £400.

De Blois, anxious to ensure the success and prosperity of the institution, vested the Brethren of the Hospital of St. John with the guardianship, but this sacred order, probably regarding the charity as a means for supporting the soldiers rather than the needy brethren of Christ, quarrelled with Bishop Toclive, the benefactor's immediate successor, and repudiated all episcopal authority. After an appeal to Papal jurisdiction the Hospitallers were obliged to relinquish all control, and the hospital again came under the direct care of the Church.

With sound administration, the increasing revenues were sufficient to feed an additional hundred poor in the dining hall, but abuses, from which no charity is exempt, soon made their appearance, and we next hear of the funds being perverted to the private uses of the masters and stewards, to the injury of the inmates and the utter neglect of the outside poor.

John de Edington, nephew of the Bishop of Winchester of that name, was among the worst offenders, and on quitting office he removed the whole of the stock and everything of value he could lay his hands upon. The next master, William de Stowell, exchanged his official position with Roger de Cloune for a Yorkshire rectory, and Cloune immediately proceeded to enrich himself at the hospital's expense with the evident intention of making as much profit as possible during his tenure of office. And but for the appearance of a champion of the sterling worth, capacity and resolution of Wykeham the hospital might have ended its career of usefulness at this time. Happily the rapacious scoundrel, in spite of tenacious opposition, was obliged to refund the full amount of his depredations and to pay in addition the cost of legal proceedings.

Wykeham's time and that of his successor were the palmy days of the institution. The latter—no less a man than Cardinal Beaufort—not only attended to the proper administration of the funds, but enriched them very considerably, rebuilt the hundred-mennes-hall, and erected the whole of the buildings of the west and north side of the quadrangle. Besides this, he founded in 1444 a separate establishment with accommodation for two priests, thirty-five brethren and three sisters, calling it the almshouse of noble poverty, *i.e.*, Domus Elemonfinarea nobilis Paupertatis; by which it is inferred that the donor intended it to be an asylum for decayed gentry.

This period of prosperity was of short duration. Already the leaven of corruption had entered into the monastic system; the new learning had made sufficient headway to discredit the old theories, and men having received merely enough to distrust the creed of their fathers became a prey to doubt and unbelief, without rudder or compass on a sea of scepticism. New ideals formed slowly, and in the meantime egoism, self-seeking and time-serving marked the state of unrest, the interim between one faith and another. The institution fell upon evil days, and its condition depended upon the character and capacity of the governor in charge.

During the Commonwealth John Lisle ruled the charity and was succeeded by Cooke, the solicitor to Parliament. The former was husband to Alice Lisle, who incurred the enmity of the implacable James II. for harbouring fugitive rebels and suffered the extreme penalty. Her attainder was reversed by the Parliament of William and Mary. Lisle, the regicide, fled to Switzerland the free, the asylum of the outcast, but died by the hand of an assassin, instigated by the reward offered by the revengeful James.

In 1667 Henry Compton, the celebrated fighting bishop, held the mastership for some years and signalised his term of office by erecting the wooden cloister and brick gabled projection on the east side, which bears his name inscribed upon a stone tablet below the upper window.

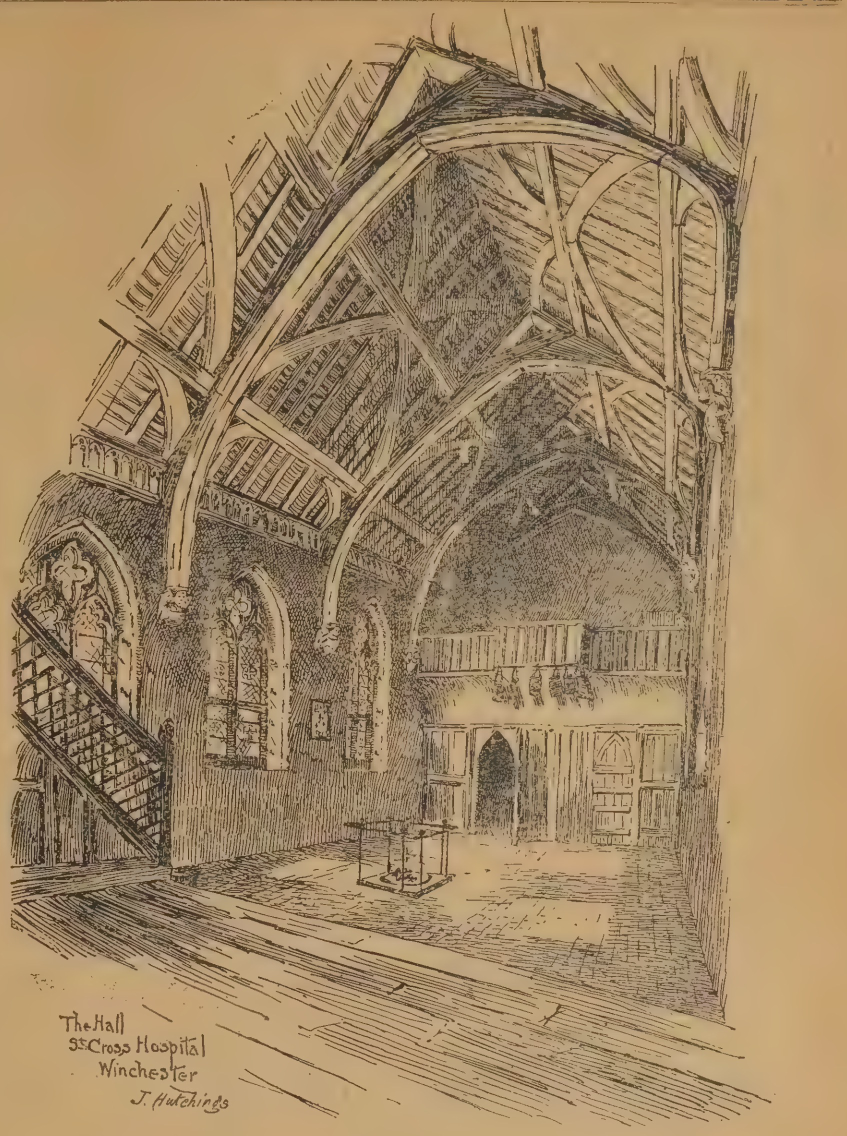
In 1696 the master's residence was greatly enlarged at the expense of the inmates' lodgings, the south side of Beaufort's quadrangle was razed to the ground, and systematic neglect suffered the greater portion of the remaining buildings to become dilapidated and ruinous. Happily a revived interest was taken in these ancient institutions about sixty years ago, and both foundations are now under the control of the Charity Commissioners. Under the improved régime thirteen old men are maintained in the hospital and are provided with the quaint costume instituted by the Knights Hospitallers. Four representatives of noble poverty are also supported by annual payments of ten pounds each, and they, too, wear the dress prescribed by Beaufort the founder—namely, a red robe adorned by an embroidered cardinal's hat and tassels.

The existing buildings form three sides of a quadrangle, with the fine Transitional church of St. Cross enclosing a portion of the fourth side. On the north stands Beaufort's tower, under which is the entrance, and adjoining it the hundred-mennes-hall and the master's residence. The west wing contains the lodgings of the inmates, also Beaufort's work. The cloister on the east, with the infirmary above, belong mainly to the seventeenth century.

The quadrangle is laid out in straight paths enclosing neatly-kept lawns, surrounded by flower borders and shrubberies; in the centre a moss-grown sundial indicates the passing hour and forms in this asylum for the superannuated a fitting symbol of the brevity of human existence.

The effect of passing from the outer world into this quiet retreat, full of eloquent mementos of our remote predecessors; this sanctuary, consecrated to peaceful old age and declining years; is soothing in the extreme. At one's feet is the cool green sward, edged with a band of bright-coloured flowers, and above rise the grey weather-stained walls of the buildings, with their architecture so simple yet so full of dignity, so varied and suggestive yet so majestic in the utter absence of all apparent effort, all unhealthy straining after effect. The skyline and proportions are admirable, the relation of void to solid perfectly harmonious, the detail elegant and appropriate—in short everything satisfies the eye, and the construction is plainly indicated without ostentation. Each apartment suggests its use, and the spectator sees at a glance which is the hall and which is the master's residence, that here is the church and there unmistakably the cottages of the inmates. And to add to this old-world feeling, and to complete the picture, the figures of men bowed with age totter along the paths, or sun themselves in groups, dressed in the long black coat of the Hospitaller and bearing upon the breast the badge of the order, a silver cross patée.

The entrance gateway, or Beaufort's tower, is a fine specimen of Perpendicular architecture, containing above the archway the founder's chamber. Of the same date is the hundred-mennes-hall, a handsome apartment of four bays lighted by Perpendicular windows with traceried heads, and spanned by an open timber roof of bold, simple and massive design. Over the porch is a minstrels' gallery, and at the other end of the room is the daïs, raised a few inches above the main floor-level. At the south-west corner a wooden stair gives access to the founder's chamber in the tower. There is no mantelpiece in the hall, but a charcoal fire in a brazier in the centre of the room remains the only means of heating the apartment, whence the smoke finds an exit as best it may, no provision having been made for it; and the louvre turret in the centre of the ridge designed to serve the dual purpose of chimney and ventilator, so common a feature in the halls of a later period, is wanting in this instance. A number of old leather jacks hang suspended from the gallery front. On the jambs of the windows may be seen the hinges intended to support the wooden shutters, which kept out the wind and rain at a period when glass was so costly as to be considered a luxury of the rich, and was even carried about by them from house to house and fitted into the windows of their temporary abodes.



The Hall
St Cross Hospital
Winchester
J. Hutchings

The kitchen is of ample dimensions, having an enormous fireplace capable of roasting a whole side of beef and fitted with a smoke jack of the old pattern. The master's house adjoining has been much modernised, and sash windows occupy the place of the mullioned lights of a former period. The domiciles of the inmates consist of two rooms, a pantry and a garden in the rear. This wing was built by Beaufort, and was probably intended for the accommodation of the order of noble poverty.

Compton's cloister is perhaps the most picturesque portion of the institution, being quite a patchwork of materials. The walling of red brick and flints set in rectangles is very beautiful in texture and full of rich colour, and the projecting gable breaks the straight line of building very pleasantly.

The church is a noted specimen of Transitional work, in excellent preservation, and is also curious as an almost perfect specimen of the Greek cross plan. The cloister wing abuts against the north transept, and in order that the inmates of the infirmary might take part in the services a window was constructed in the gable wall looking into the sacred building. Our illustration shows the aspect of the church from the south-east, rising from luxuriant meadows and surrounded by a fine group of elms. The celebrated triple arch is indicated in the same drawing, which gave access to a cloister, of which no vestige remains.

The interior is interesting as exhibiting the growth of the style during the construction of the building. The side aisles are lighted by small round-headed windows; the piers of the arcades are huge cylinders, crowned with capitals of true Norman type, but the arches they support are pointed, although some of the aisle vaults retain the semicircular form. By the time the triforium was reached, a further development had taken place, and here the pointed arch is used, awkwardly it is true, and as if the builders were still experimenting, but the mouldings are smaller and more deeply under-cut. The nave clearstory windows are Decorated, the west window is a good example of the Early English geometrical period, and the roof was reconstructed by Bishop Edington about the middle of the fourteenth century. The eastern portion of the choir is pure Norman, and would seem to be the oldest part of the structure.

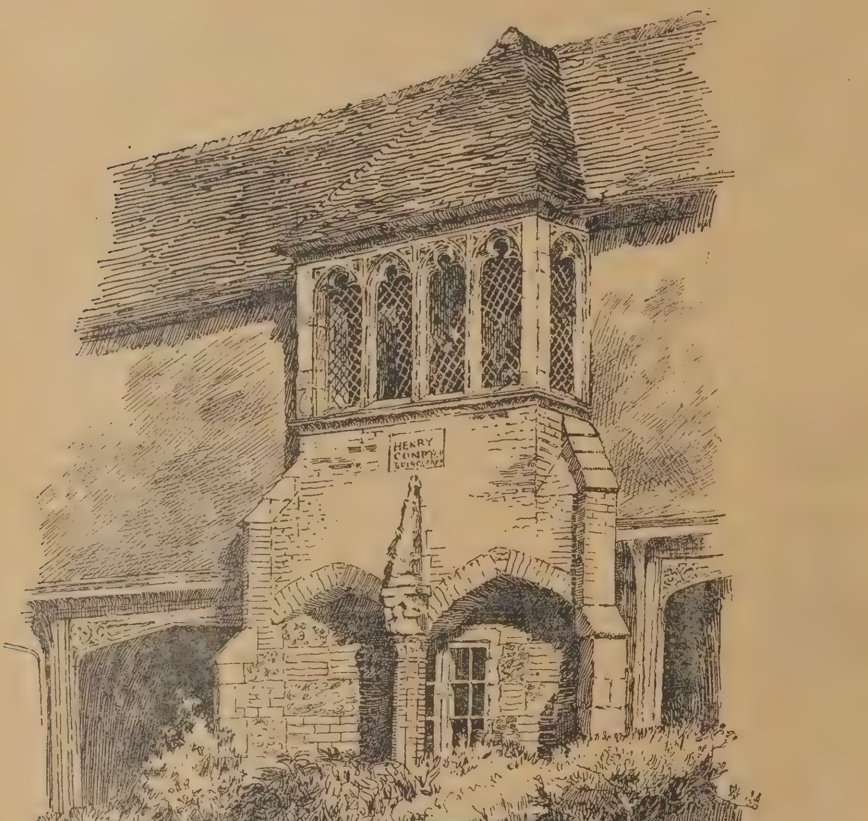
The interior is lofty, massive and well proportioned, and abounds in good detail, so that the effect must have been singularly impressive and beautiful. Unfortunately the church had the misfortune to fall into the hands of Butterfield, the great Gothic enthusiast, who considered that because traces of colour were to be found on the structure it was his duty to repaint it as nearly as possible in the same style. If the decoration is a true repliqué of what a mediæval church used to be, the twentieth-century critic can only marvel that men who could construct so superbly, and with such breadth and masterly skill, should have been so absolutely deficient in true feeling for colour decoration, and he can only hope that with the extinction of the Gothic purist the desire to colour our ancient cathedrals and churches after this model will entirely disappear. If the ancient fabric had been handed over to the modern house-painter, with instructions to spare no expense, the effect could scarcely have been more heartrending. We may thank Heaven, though it is almost too late, that our eyes are at last opened to the vicious depredations of the restorer of the old school, and we may be pardoned for regarding this measure of enlightenment as a proof of some progress in art education and culture.

The spirits of bygone worthies still seem to hover over the scene of their earthly strivings, anp are brought home to us in mottos and memorials. Some of the fourteenth-century tiles bear the legend "Have Mynde." On a window you may read: "Orate pro anima Richardi Buteshull." He was master in 1346. Wykeham's and Cardinal Beaufort's arms decorate the roof. On the walls of the gallery over the cloister wing Robert Sherborne, afterwards Bishop of St. David's and later of Chichester, inscribed the words "Dilexi sapientiam R. S. 1503."

Among those connected in the past with the Hospital of St. Cross two names stand out most prominently, namely, Bishop Wykeham and Cardinal Beaufort. History informs us that both of them were rapacious, possessed of splendid retinues, were arrogant in manner and amassed large sums of money. The world contains many such to-day. But we have evidence other than historical of how they expended much of the money for which they were condemned, and how they exercised the power that made them objects of envy. Wykeham, the great architect—who built and endowed among other establishments Winchester College, the prototype of the English public school; also New College, Oxford, and furnished it with a charter that entirely revolutionised the effete systems of teaching previously in vogue: who, while engrossed upon works of this magnitude, yet took care with incalculable pains that the revenues of an obscure charity like St. Cross should be properly administered and the buildings renovated and restored: who, while engaged upon such an engrossing and gigantic undertaking as the rebuilding of the western limb of Winchester Cathedral, whose majestic proportions still known as Wykeham's nave are the admiration of posterity, should at the same time have clothed and fed numbers of poor scholars, who but for his bounty would have been forced to have relinquished the pursuit of knowledge for a mere dull struggle for existence in the commoner walks of life.

It is curious too, and reveals a redeeming human trait in his character, that Beaufort, the wily and unscrupulous politician, the educator of princes, the elegant courtier and stately cardinal, should occupy his spare time and money in founding and endowing a charity for decayed gentlemen and for the assistance of his needy brothers and sisters.

As if in testimony of the abiding worth of noble actions the good deeds of history appear far more potent and far-reaching in their effects than evil deeds. When the latter are absolutely forgotten the good that was done some hundreds of years ago still remains a boon and blessing to mankind. It is the prerogative of time to decree what shall survive and what shall perish, and to preserve for future fame whatever bears the impress of truth. If only our modern millionaires would cast aside their selfish egoism, and recognise the responsibilities of wealth, determining to discharge their obligations worthily we might expect a revolution beyond parallel in history for far reaching effects and beneficial results. We should see literature, science, inventiveness and all noble pursuits become a power amongst men; we should see art etherealised, extended, exalted, converting the deadly dulness of our cities into the enchanted loveliness of fairyland; and even the man in the street might learn to play his part intelligently and become a thinking rational creature, not unsusceptible to the seductive spell of beauty, the refining influence of culture. Such men would richly deserve a name and a place in history well worthy of comparison with the grand old Wykehams and Beauforts of old.



THE COMPTON CLOISTER, HOSPITAL OF ST. CROSS, NEAR WINCHESTER.

YORK ARCHITECTURAL SOCIETY.

VISIT TO GILLING CASTLE.

On August 10th the members of the York Architectural Society journeyed to Gilling, where they wended their way along the woody eminence to the castle. On the eastern terrace, in front of the oldest portion, Mr. John Bilson, F.S.A., gave an address on the building and its owners. In the basement is a blocked doorway, in the arch of which are shields bearing the arms of Etton, the then owners of Gilling. This doorway communicated by a central passage with rooms on either side, all having barrel vaults. At the other end of the passage is a flight of stone steps which led to the upper apartments. A monument in the south aisle of the church may commemorate Thomas de Etton, the builder of this fourteenth-century tower-house. From the Ettons the property passed into the hands of the Fairfaxes of Walton, one of whom, Sir William (son of Sir Nicholas, whose tomb is in the church), made considerable additions to the castle. To him is due the beautiful dining-room. In the eighteenth century the west front with wings was added from the designs of William Wakefield, architect, of York.

The party proceeded to the west front and ascended the steps to the entrance. In the hall an oak screen designed by the president of the society (Mr. C. H. Channon, F.R.I.B.A.) attracted attention. The dining-room was entered, and its painted glass and heraldry described by Mr. Bilson. The room is perhaps the finest Elizabethan room in the country, and is 39ft. 5in. in length, 22ft. 2in. wide and 17ft. 3in. in clear height. It is panelled in oak to a height of 12ft., and there are seventy-five panels inlaid with varied ornament and enclosed by mouldings carved with egg and tongue ornament. Surmounting the panelling is a painted frieze on which is a series of trees representing the Wapentakes of Yorkshire; on the trees hang shields of Yorkshire gentlemen living at the close of the sixteenth century who were entitled to bear arms. Altogether there are 449 shields. The room is lighted by three large windows enriched with painted glass depicting the Fairfax heraldry, and partly the work of Bernard Dininckhoff (1585). The bay window emblazons the arms and descents of the Fairfaxes, that in the south window those of the Stapletons. The glass in the other window is of rather later date, and contains the arms and descents of the Constables. The imposing fireplace is enriched with heraldry. The ceiling is of plaster, ribbed, with pendants.

The basement was inspected, and afterwards the rooms of the later additions designed by

Wakefield, including the long gallery. On the motion of the president (Mr. Channon) a hearty vote of thanks was accorded to Mr. and Mrs. Wilson for their kind permission in allowing the castle to be inspected. The church was subsequently visited under the direction of Mr. Bilson.

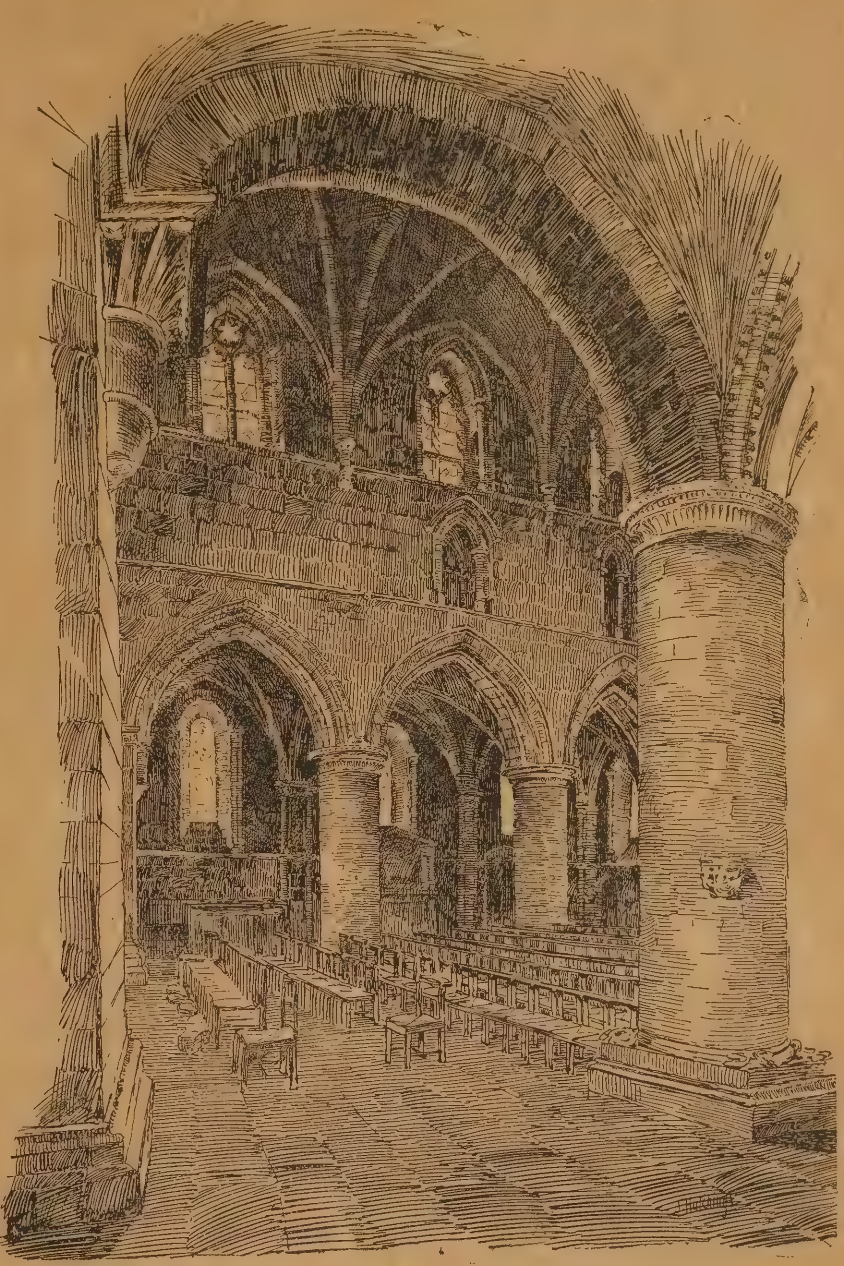
THE IMPORTANCE OF SECURING GOOD WORK.

WE have been amazed sometimes at the easy-going way in which architects will accept tenders for work intrusted to their care. One would almost think they had but slight understanding or appreciation of their responsibilities in regard to the practical outcome of their work. The importance of the result is not to be measured merely by the satisfaction of one's client. The attainment of that may be a comparatively easy task, for clients as a rule cannot be expected to entertain more than a general and superficial idea as to the real character and value of the work from a practical point of view. An architect to a large extent builds up his reputation, we know, by giving satisfaction to his clients; he enhances it considerably by making his work command the appreciation of his fellow architects and of builders by reason of practical excellence in all the details of the finished result. And scarcely secondary in importance is the self-consciousness that this complement of excellence has been the result of a faithful and diligent exercise of personal care and attention upon the actual carrying out of the design.

Naturally one of the prime essentials to a successful issue is the employment of a satisfactory contractor. How much depends upon this any architect of experience knows full well. It is next to impossible to insist on good work with a cheap contract or a doubtful contractor. No architect can confidently or rightfully expect the best of work and materials at a price which does not reasonably admit it. But the client apprehends no difference; he looks to the architect to secure the best result, whatever the price or conditions of contract. Therefore, when an architect, willingly or unwillingly, entertains a contract or contractor in whom he cannot have the fullest confidence he assumes a responsibility which is no mean addition to his legitimate functions as supervisor of the work.

There are cases, however, in which other considerations than the mere question of cost is taken into account by clients. Sometimes it is desired to give a local contractor the preference, simply as such. This of course may seem right and proper in its way, but in a country place where perhaps a good house is to be erected in which everything is to be of the best an architect will usually find it absolutely necessary for the ensuring of good work and materials to employ a contractor of whom he has intimate business knowledge, and who is acquainted with the particular character and quality of the architect's design. An engineer of our acquaintance, who makes it a matter of personal pride and satisfaction to allow his name to be associated with no sanitary scheme which is not carried out in the most thorough and complete manner down to the minutest detail, complains sometimes of having to employ local contractors in country places. He argues that the firms he usually employs know exactly what his specifications mean, and are so used to working under his instructions that he knows he can be perfectly certain of thoroughly satisfactory results; whereas in the case of the local man he generally has to instruct him in regard to every detail and to see that every instruction has been actually carried out, thus entailing an extra amount of care and responsibility on his part alike unnecessary and irritating. And even then the chances are that the work will not be nearly so well or quickly finished as if one of his own selected contractors had undertaken the contract.

Where an architect may be compelled by stress of circumstance to employ a contractor of whom he personally has no knowledge, it behoves him to be specially careful in the oversight of the work, and providing the terms of the contract are in his opinion reasonable—that is, fair to the client and just toward the contractor—to see that it suffers in no detail by deviations from the specification. There is nothing unreasonable in seeing that you get what you pay for when buying an article in a shop, neither is it derogatory to an architect's professional reputation to see that a contractor duly fulfils his obligations. In fact, this is practically just what the client pays the architect for, and in this way it becomes his imperative duty to see that it is done. As we have said before, where the architect knows his contractor and can repose the utmost confidence in him his burden of responsibility is very much lightened. Under other circumstances he incurs an unknown risk, against which he must of necessity take extra precaution.



INTERIOR OF CHURCH, HOSPITAL OF ST. CROSS, WINCHESTER. DRAWN BY JOHN HUTCHINGS, A.R.I.B.A.

The insistance upon good work is by no means so thorough-going in the majority of cases as we should like to see it. We could name a few architects whom we know as having a mind of their own in regard to this question, and whose work is evidence in itself of the patient personal attention which has been bestowed upon the supervision of its execution. On the other hand there is a sort of idea abroad that a kind of passable standard may be accepted—a standard which cannot be called really bad or inferior, but which certainly cannot be designated first-rate. No greater mistake could be made by a young architect than to let such a notion get possession of him. The best is always the best, and the best reputation—the reputation most to be desired—is built up by the best work. "Good workmanship," said one of the most gifted of modern architects, "has been in every age the very foundation of good architectural design." We believe most emphatically that it is more than ever so to-day. There is nothing better than the best and nothing cheaper than that which lasts the longest and wears the best: which remark, in spite of its being something of the nature of a platitude, is the central principle of all that is sound and good in building.—"Architecture" (New York).

A Larger Town Hall for Westminster is needed, the city affairs having outgrown the municipal buildings—still known as St. Martin's Town Hall. A big scheme of extension is being inaugurated. This provides for a new upper storey and the carrying back of the building beyond its present wall. The interior will be rearranged. The work will take eight months; the cost will be £10,000. The city officials are using temporarily the old town buildings in Caxton Street.

THE NEW CASTLE OF KILDRUMMY.

MR. AND MRS. JAMES OGSTON have taken up residence in the new Castle of Kildrummy, which has been in course of erection for the past two or three years, and is now almost completed. Concurrently with the building of the new house and the construction of a stone bridge which brings the old and the new castles into direct communication, Mr. Ogston has taken measures to preserve the ancient edifice, though he attempted nothing in the way of restoration. Dangerous portions have been strengthened, the exposed tops of the walls covered with cement so as to prevent disintegration of the binding material, and loose stones replaced.

Old Kildrummy Castle has not only engrossed the special attention of antiquaries from the fact of the ruin being, if not the largest, at least one of the largest, among ancient castellated structures in North Britain, but it has also been of great interest to all students of the annals of Scotland from its stirring historical associations. The remains also show that the castle—once the palace of kings—had not only been of great extent, but of much architectural magnificence. The castle is situated in the gorge of the extensive valley through which the Don finds its way to the eastward, and which, expanding to the north, reaches almost uninterruptedly to the base of the "Tap o' Noth," in Strathbogie.

It is built of hewn stone—a fine freestone; but although Aberdeenshire is marked for its granite, it by no means follows that this material had to be brought from a distance. It was long conjectured, and is now conclusively proved, that the cream of the buff-coloured freestone used was got in the immediate locality. The plan of the structure is that of the old baronial fortification—round towers at the angles flanking retiring screens, with a gateway between two other round towers. These circular towers, as the remains indicate, rose from a broad base slanting slightly inward, and forming an outline both of beauty and strength.

Kildrummy is also unique among the castles of Scotland from the fact that a chapel forms a conspicuous feature. The "Snow Tower" towards the west was identified by Dr. Jamieson as the Snowdon of Barbour which King Edward dilapidated. It is 55ft. in diameter. The great hall in the northern part of the building, still to be traced with accuracy, was oblong in shape, measuring 73ft. by 40ft. The chapel measured 35ft. by 20ft., and had a great window to the east, which is still preserved. The eastern front, including the towers, is 180ft. long, the northern 262ft. The distance from the chapel window to the nearest wall of the "Snow Tower" is 200ft.

The new castle has been built from designs by Mr. A. Marshall Mackenzie, A.R.S.A., of Aberdeen. The bridge connecting it with the old castle is an almost exact reproduction of the old Brig o' Balgownie further down the Don.

The new castle is more in the style of an old English manor-house than a Scotch castle, partaking of the Elizabethan character with its outlying terraces, prominent gables, mullioned windows, stepped parapets, and tall chimneys grouped in masonry in the picturesque form to be seen in such typical English residences as Haddon Hall. The building measures over 100ft. each way, the main front, which faces the ravine and the ruins, being 108ft. long. It rises from a high terraced garden constructed on the edge of the valley. The chief front consists of a one-storey portion in the centre, flanked on either side by a two-storey wing with high gables and oriel windows. A main building connects these two wings in the rear, and shows a gabled projection in the centre. The entrance door is situated in a massive tower which rises to a height of about 50ft. and terminates in a flat roof with stone parapet. The beautiful cream-coloured freestone found on the estate has been used. The quarry from which the stone was got is indeed so close to the new house that the stones might have been swung by the cranes out of the quarry into the dressing sheds. The stones are in 7in. courses, with two courses to one corner stone. A notable feature of the front are the corbelled oriel windows in the two wing gables. These windows terminate in battlemented balustrades in harmony with the centre building. The interior of the entrance porch is lined with freestone ashlar, with floor of the same material, the joints of the stones forming a geometrical pattern. From the porch runs a spacious corridor traversing the whole length of the house to the west side. The corridor is 86ft. long and 12ft. wide. The walls, ceiling and floor are of oak, the last being in parquetry. At each end there is a large oriel window. Opening off the corridor towards the front are the library, billiard-room and drawing-room. The drawing-room is L-shaped with two oriel windows, one to the south and one to the west. It has a richly-designed fibrous-plaster ceiling in the Adams style, delicately and gracefully executed. The billiard-room occupies the central space in the one-storey building already referred to. The staircase is of oak, with a close balustrade of carved panels instead of the usual open balusters. The dining-room is situated on the west front, and is a spacious apartment with oak floor and ceiling and high dado. The kitchen and domestic offices occupy the rear of the ground floor and are extensive and complete in every way. Underneath the main floor are cellars, bicycle house, &c., the latter having a convenient entrance from the lower terrace. The upper floor is occupied with bedrooms, dressing-rooms and bathrooms. The whole castle is lighted by electricity produced by a dynamo on the premises, and a new supply of water has been provided from a copious spring nearly two miles distant. A large stable has been built not far from the castle, with coach-house and coachman's house. One of the striking features of the grounds is the main gateway, a specimen of wrought ironwork executed by Treasurer Bisset, Aberdeen.

BRICKMAKING IN SOUTH AFRICA.

IN many brickyards in South Africa making is done chiefly by hand. In the pit benches are worked up in rows. The negroes dig the clay and shovel it into a wheelbarrow and dump it into the pug mill; that is, the wheelbarrow is emptied at the pug mill and from there the clay gradually shovelled into it. The pug mill is usually worked by one horse; sometimes two horses are employed.

In the pit are two men. A negro pulls clay sufficient for one brick from the pug mill and brings the lump of clay into some shape. The white man next to him slings that into the brick form or mould, strikes off the surplus with a straight edge, knocks out the brick and lays it on a board near by. Another black man sands the brick at both sides and wheels the boards with bricks to be set up at the drying ground or shed. That white man gets about £20 a month, not less.

There is no standard size for bricks, but as most of the brickmakers are English they keep more or less to the English sizes. On the whole the African bricks are very rough, and vary greatly. Here are some of the sizes:

	Inches.
Stock brick of the Ferreira	9 × 4½ × 3
Firebrick of the Ferreira	8¾ × 4¼ × 2⅝
Stock brick of Johannesburg Brick Co.	8¾ × 4¼ × 2⅝
Firebrick of Johannesburg Brick Co.	8½ × 4⅜ × 2¾
Stock brick of Franco-Italian Co.	9 × 4¼ × 3
Stock brick from other companies	9 × 4¼ × 3

These are all solid bricks, with sometimes a small recess on one of the flat sides.

At the Franco-Italian Co. they also make bricks of other dimensions. The size 2⅝in. by 4¼in. by 9in. is much liked. Their ring kiln is about 40ft. by 120ft. They also make the small square floor plates or tiles, and there will be a good market for such tiles all over Africa. They have small re-presses with the respective patterns, and a special auxiliary kiln for such ware.

A description of a plant erected early in 1899 may be of interest. It is owned and operated by the South African Contracting Association. The whole business is in one building of the best workmanship, carried up with best brick, wooden roof trusses and iron roof. The doors fit well. The windows extend to the top of the roof, and can be closed so that all the heat can be kept in. There are movable tramways around the kilns for the purpose of taking on tracks the dried bricks to the kiln and the burned bricks to the outside. The floor around the kiln as far as to the driers is the natural sand or soil. The rest of the floors, as well as of the driers, are of wood. The basement is about 6ft. in the clear, and the joists and beams are supported by square wooden posts. Across the front end of the building is an excavation about 15ft. to 20ft. wide, with two pairs of disc blowers, each pair being driven by a separate electric motor, to blow air into the basement. In the rear wall of the basement are two pairs of disc exhausters, discharging into open well-holes. The brick driers, built up upon the main floor, are light timber structures, covered all around with cotton material. Within are racks upon which the brick are set for drying. The driers are subdivided by cross partitions, so as to cut out any compartments whilst being filled or emptied. The doors, of light skeleton frame, canvas-covered, have no hinges, but are merely fastened by buttons. In the floor of each compartment are trap doors about 15in. square, or rather square holes with wood covers, the principle of the driers being that the blowers and exhausters cause a current in the basement; that the saturated air from the drying brick is drawn through the square holes in the floor and discharged into the well holes; whilst the warm air, the waste heat from the kiln, is passing through the canvas and around the brick, and thus effecting the drying.

The main building is 237ft. long by 137ft. wide. The kiln, with continuous firing, has an inside measurement of 141ft. by 34ft., with walls 9ft. 10in. thick at the base, built of rubble masonry and brickwork lining. The clay is raised in trucks by incline, and at the floor over rolls, tipped and shovelled into the first rolls and to the first pug mill, then to fine rolls and a second pug mill, is forced through an opening 9in. by 4½in., and from there to a wire-cutting table. The whole machinery plant is in duplicate, each half working independently of the other. The pressed bricks are conveyed by wire rope on trays swinging on rope to driers, and are there placed on racks by hand. The draught for driers is furnished by large fans. The kiln gases are conducted to a large central flue by branch flues, each of which can be disconnected from the main flue by dampers. The main flue runs into the base of a brickstack 130ft. high. The kiln will hold 300,000 bricks, and will have for the present a daily output of 20,000, which can be increased by 50 per cent if necessary.

The brick-machine is supposed to make 20,000 to 25,000 bricks per day, requiring 12-h.p., from clay taken from the face without any tempering. The weight of the machine is about five tons. The makers in England also make a smaller size to produce 12,000 bricks per day, with 6-h.p., without hoist.

The press room is well arranged. On the top floor, above the first pair of rolls, is an arrangement consisting of crank disc, crank pin, connecting rod and sliding block to push the clay down, to be taken by the rolls. They have also electric generators for power, for fans and electric light. For small ware they also have an auxiliary kiln. The pressed bricks are excellent, and some are made with square holes through the width, and not lengthwise as in others. The wires will cut off six bricks at a time. To convey the bricks from the presses, the Bleichers wire-rope system is used. The pendants have two shelves, and they run along on the inside line of all the driers. At the open doors of the drying compartments the bricks are taken from the shelves and set up on the wooden racks of the driers. All the kilns working continuous have three rows of pipe on top of the furnace, with caps and sand seals. The fuel (coal) is fed down these pipes.

In the east end of the Rand (sometimes overlaying the gold) there is plenty of coal, and on account of the great traffic a railway, exclusively for coal, is being built along the whole reef, say for about sixty miles or more, to carry coal to all the gold mines, without otherwise interfering with the traffic of the main line.

As a rule, brickyards in South Africa are surrounded by a veritable chaos, with clay pits lots of abandoned pits more or less filled with water, and all sorts of rubbish, hills of waste brick, and a motley population of Negroes, Malays, Hindoos, Arabs, &c.

PAINTING THE TOWER BRIDGE.

THE TOWER BRIDGE, which cost near one million sterling, is being cleaned and repainted. The maintenance of the bridge involves an annual expenditure of upwards of £8,000 and further outlay is necessary periodically for the preservation of the fabric. The work now in progress is being done by contract at the sum of £5,000, that being the lowest tender. The highest was £18,000. The undertaking, needless to say, is, from a mechanical point of view, somewhat difficult, necessitating the making of special arrangements to avoid interference with the traffic, and with the raising from time to time of the bascules. The magnitude of the work may be judged from the fact that it will take some seven months to complete. About 140ft. above high-water mark a wire rope has been stretched, tested to bear a weight of 15 tons. From this rope Palmer's travelling cradles have been suspended, enabling the painters to commence work on the high-level footways. The difficulty of painting the bascules has also been solved by means of the travelling cradles, which will be always kept on a level. When the two portions of roadway are raised the men painting from the travelling platforms will be hoisted into the air, and will be able to continue their work as though nothing out of the way had happened. It is when the painting of the inside of the hydraulic machinery is attempted that danger to the men will arise. The four inside girders of each bascule have to be painted too, and these move in a "quarter-circle chamber" when raised or lowered. The men will be slung in the cradles, and as long as they exercise due care there is no reason why, as the girders ascend and descend, they should not move in perfect safety with them. The bridge, inside and out, will be given three coats of paint. The original colour was a crimson lake. This will now be altered to two shades of green, with a peacock blue for all the panels. No less than 56,800lb. of paint will be required, as well as 300 gals. of varnish, and eighty men will be kept constantly engaged by the contractors, Messrs. Arthur H. Inns.

DRAWN BY JOHN HUTCHINGS, A.R.I.B.A.

Law Cases.

Non-Observance of Covenants.—In the King's Bench Division of the High Court of Justice the case of *Long Eaton Recreation Ground Co., Ltd.* v. *The Midland Railway Co.* was heard recently. In his award Mr. Justice Lawrance said: The defendants own land on the north-west of Springfield Avenue, Long Eaton, which they purchased from grantees of the plaintiffs. The conveyances from the plaintiffs to these grantees contained covenants that they would not erect or permit to be erected any erection or building of any kind except a fence wall not more than 2ft. high with suitable iron palisades nearer to Springfield Avenue than the line drawn on the plan annexed to their conveyance and marked "building line," and would not erect any buildings on the land conveyed other than private dwelling-houses of a certain value with proper conveniences fronting Springfield Avenue, and would not carry on upon the land conveyed any trade or business of a noisy or offensive character. The defendants accepted these restrictive covenants. They have now constructed a railway embankment with a permanent railway upon the land. It is admitted that the embankment encroaches beyond the building line. Instead of a 2ft. fence wall they have erected a post and rail fence nearer Springfield Avenue than the building line, and they intend to run trains along the railway. In my opinion each of these specified acts, if done by a private purchaser of the defendants' land, would have been a breach of the restrictive covenant, for which such a purchaser would be liable to be restrained by injunction. It was argued for the defendants that a railway embankment was not a "building" within the meaning of the covenant. I hold without much hesitation that a railway embankment alone—that is, even without its possible appurtenances, such as signal-boxes, &c.—is a building within the meaning of the covenant, the object of which is to maintain a uniform range of buildings (*Child* v. *Douglas*, 1 Kay, p. 567). But it can hardly be contended that if a private owner were to make and use a railway on this land he would not be carrying on a "business of a noisy character" within the meaning of the covenant. I think that upon all the claims the plaintiffs are entitled to compensation, and I give judgment for them for £650, the amount of the award, with interest.

The Removal of a Sign-Post.—Last week, in the King's Bench Division of the High Court of Justice, the case of *Hoare & Co.* v. *Metropolitan Borough of Lewisham* was heard. This was an action brought to restrain the defendants from removing a sign-post and water-trough erected by the plaintiffs in front of the Marquis of Salisbury Hotel at Lewisham. Mr. Justice Lawrance in giving judgment said that in February, 1899, an improvement in the premises of the plaintiffs being about to take place, it was suggested by plaintiffs' architect to the defendants that the trough should be removed and a drive should be thrown into the roadway to remove an obstruction to traffic, and that the sign-post should be removed to the corner of the street in front of the new house to be erected by the plaintiffs. The question arising was whether the drive was dedicated to the public. In his opinion it was not, and he further held that the plaintiffs were entitled to have the sign-post where they had placed it. Under the circumstances the plaintiffs were entitled to the declaration they asked for, and he therefore found for the plaintiffs with costs.

Builders' Notes.

The Death is announced of Alderman T. Callund, J.P., head of the firm of Callund & Sons, builders and contractors, of Rochester.

Lead Poisoning of Painters is avoided in France by simply substituting white oxide of zinc for white oxide of lead in painting the insides—if not the outsides—of Government buildings.

Death of Mr. John Gurney, of Gloucester.—Mr. John Gurney, of the firm of John Gurney & Son, builders and contractors, of Gloucester, died on August 10th after a severe illness. Deceased was forty-nine years of age.

Mr. Alexander Cargill, one of the best-known builders and contractors in Forfar, died recently at the age of about forty-five years. He succeeded his father in the business about five or six years ago, one of his most recent contracts being the erection of the new fever hospital for the Dundee and Forfar District Committees.

Workmen's Dwellings at Merthyr.—At a recent meeting of the Merthyr Urban District Council seven tenders were opened for the erection of 100 houses at Penydarren, under the Housing of the Working Classes Act, and that of Mr. John Morgan, Blaenavon, at £13,600 being the lowest, was accepted.

Cardiff Builder's Failure.—The first meeting of the creditors of James Seymour Chubb, trading as J. S. Chubb & Co., builders, 72, Metal Street, Cardiff, was held recently at the office of the Official Receiver. In the prescribed summary of affairs the gross liabilities were set down as £6,882 7s.; expected to rank for dividend, £4,385. The assets totalled £1,485 15s. 10d., leaving a deficit of £2,899 4s. No composition was offered.

Building at Oban.—Builders in Oban have been somewhat slack for a year now, but there are indications that trade may be brisker for the coming winter. The most important operations at present are the extensive additions and alterations to the Rockfield Road building of the Oban High School, the contract for which is in the hands of Messrs. Connell & Fraser. The interior of the school is being entirely altered and a large wing added to the north end. The same contractors are about completing a Roman Catholic chapel at Taynuilt, designed by Mr. G. Woulfe Brenan, C.E., architect, of Oban.

America and the Cement Trade.—Manufacturers of cement in Great Britain are awaiting with concern the return from America of several prominent men of Lancashire and Kent. These gentlemen have gone to the United States to look into the secret process of making cement employed by the Americans. The Americans make the same amount of cement in three hours that is made here in three or four weeks. The rotary roasting mills are used, and the cost of manufacture in the States is half the amount spent in Great Britain. A London cement merchant who has just returned from America saw while in New York the manufacturers interested and learned from them that British control of the cement industry was threatened and that the cement manufacturers of this country must adopt the American process or be driven from the field.

American Scheme to buy Belgium Glassworks.—A meeting of the master-glassworkers of Brussels and the American delegates was held recently at Charleroi. The correspondent of the "Journal de Charleroi" at Jeannette (Pennsylvania), says: "It is stated here that Mr. Chambers went to Belgium to form a company to be called the Belgium Window Glass Co., and that the Americans intended to purchase the Belgian factories by paying the proprietors of the works a certain sum of money immediately and leaving them the choice of taking or retaining a number of shares in payment of the balance of the purchase money. The amalgamation would result in economy in working, and would permit of the maintenance of good prices. It is hoped that later on the American Window Glass Co. and the Belgium Window Glass Co. will come to terms whereby the American company will take a certain quantity (about 14 per cent. of the output) of the Belgian glass. It is rumoured here that Mr. Chambers' proposals will certainly be accepted."

Surveying and Sanitary Notes.

The Sanitary Institute will hold its next congress and exhibition in the city of Manchester in the second week of September, 1902, under the presidency of the Right Honourable the Earl Egerton of Tatton.

Value of Land in Southwark.—A new sorting-office is to be built by the Post-Office authorities in the vicinity of Union Street, Southwark. About 38,900ft. of land belonging to the Ecclesiastical Commissioners is required for the purpose, and Mr. R. Vigers sat last week as arbitrator to assess the price. The prospective purchasers placed the value at £23,000 and the sellers at between £29,000 and £32,000. Mr. Vigers reserved his award.

Heating and Ventilating Drury Lane Theatre.—The transformation which has been going on in Drury Lane Theatre for the past two months is now nearly complete. The internal change effected has been very sweeping, but in no respect nearly so radical as in the heating and ventilating arrangements. Three powerful fans driven by electric motors have been introduced. Their work will be to keep the half-million cub. ft. of air within the theatre and stage fresh and pure, and in the winter months up to the required temperature. This they will be able to do, for they are powerful enough to change the whole air of the theatre five times during an ordinary performance of four hours by blowing in 380 tons of fresh air during that time. The air will be purified by being passed in through a coke filter.

The Widening of Blackpool Promenade.—Details are now made known of the scheme for forming a new promenade at Blackpool from the north to the south shore. Plans have been drawn up and powers have been in part obtained for adding 100ft. to the width of the promenade for the whole length from the Metropole Hotel to the Victoria Pier. At first the intention was to add 60ft. only, and powers for this purpose were duly obtained from Parliament last year. The cost of the work was estimated at £350,000. After the Bill was passed it was found that if a convenient up-to-date promenade was to be made, with every accommodation for trams and carriages, an additional width of 60ft. would be insufficient. Hence the recent decision of the Highways Committee to recommend the Council to make the additional width 100ft. instead of 60ft., at an extra cost of about £40,000. This recommendation has been approved by the Council The extra width will be obtained by appropriating some of the foreshore, but the houses will not be interfered with. When the widening is completed the space provided for the public will be 142ft. wide at the narrowest point and about 180ft. at the widest point. A footpath will be made along the east side. Next to this will be a carriage-way 42ft. wide. There will also be an island footpath 10ft. wide, next to which will be the special tram track, 17ft. 6in. wide. The rest of the space will be available as a promenade for pedestrians, who will thus have a walk of a mile and three-quarters from the Victoria pier to the Metropole, and beyond that a further walk of nearly a mile either at the top or at the foot of the cliff-like works at the north.

Work of the Ordnance Survey.—According to the annual report for 1900-1 of the Ordnance Survey Department the South African war has greatly hampered their work. Nine officers out of an establishment of twenty-four have been withdrawn for service at the front; and besides these, two complete survey sections composed of non-commissioned officers and men of the Royal Engineer surveying companies have been supplied for use in South Africa. Although the work done for the War Office has been heavy the main feature for the year has been an advancement in the re-survey of Ireland. Of the 10,475 square miles already surveyed 1,650 were completed during 1900-1. The extreme closeness of detail in this work is shown by the fact that the average area of the "enclosures" on a plan is less than half an acre. Summarised, the progress made up to March last was as follows: Town surveys have been completed for Great Britain and Ireland. Maps (1–2,500) have been completed for Great Britain, together with certain re-surveys of Ireland: 1in. and 6in. maps are now ready of both the above countries. The new series of 1in. hill maps of England and Wales is proceeding; so far 48,122 square miles have been published. And all this has been accomplished with a staff of 2,613 men. The arrangements made for the sale of Ordnance Survey maps through the medium of head post-offices in Great Britain have recently been revised. Those maps may be ordered and indexes inspected at head post-offices in towns where there are no specially accredited agents for their sale. The charge for a single map or sheet ordered through a head post-office will, in addition to the actual cost of the map itself, be in future 3d. instead of 4d., as has hitherto been the case, and an additional ½d. will be charged in respect of each additional map or separate sheet ordered at the same time. On orders for Ordnance Survey maps of the value of 10s. and upwards no charge to the public will be made beyond the price of the maps themselves.

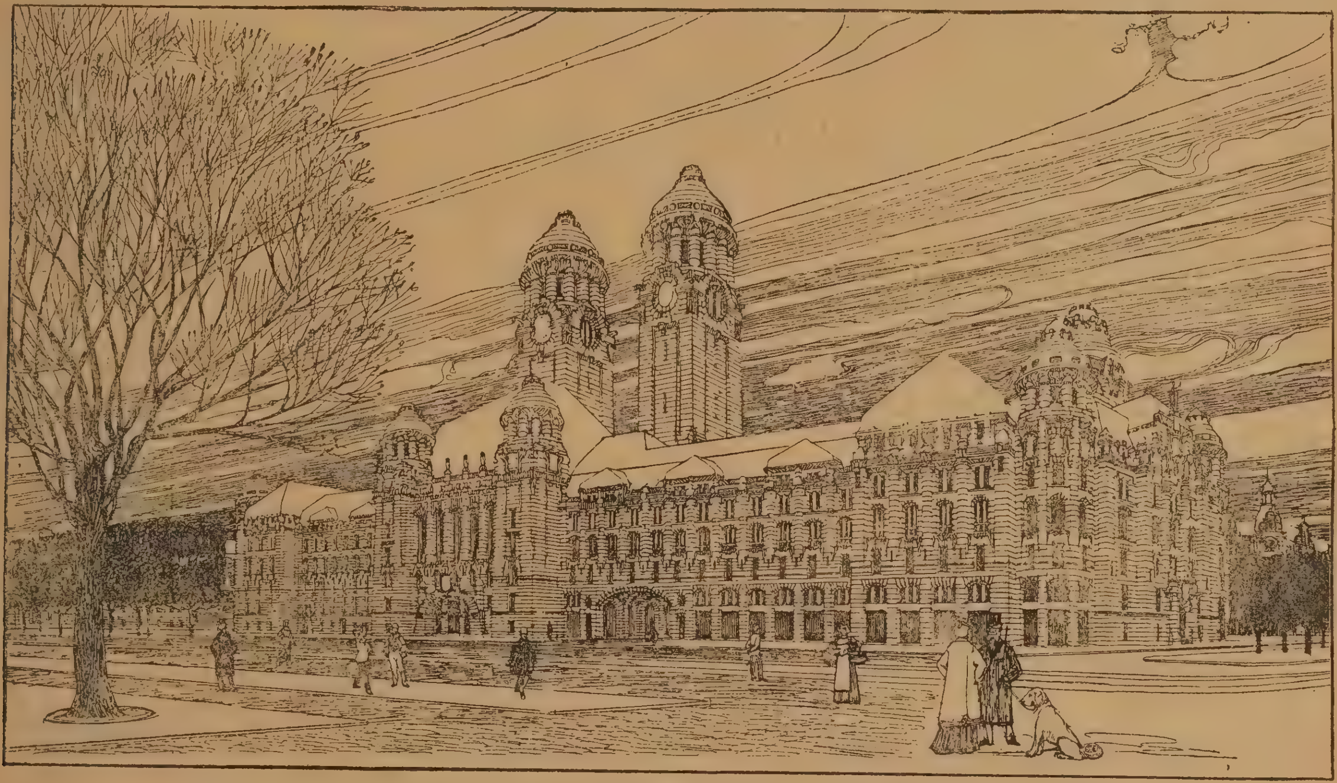
LICHFIELD GRAMMAR SCHOOL.

NEW buildings at the Lichfield Grammar School are being erected on the site at Borrowcop Hill, on the south side of Lichfield. The accommodation in the new buildings will be for 125 boys, twenty-two resident scholars, headmaster's residence, assistant-masters, nurse, and female attendants and servants. The principal entrance to the site, which is eight acres in extent and which has been given by the Conduit Lands Trusts, faces St. John Street. The buildings face the south-east, and comprise on the ground floor school- and class-rooms, master's sitting-rooms, lavatories and changing rooms, cycle house, &c. The science and art department is at the north-east end, and will contain art-room, chemical and physical laboratories, lecture-room, dark-room, stores, &c. At the south-west end the headmaster's residence is situated and comprises drawing-, dining- and morning-rooms, with ample sleeping accommodation over. The common dining hall, capable of accommodating about fifty boys, is placed near the administrative department and the schools. Over the dining hall are the sick ward, nurses'-room, bathroom and lavatories, linen stores, &c. The boys' dormitories are over the main school and classrooms, affording accommodation for twenty-two boys, in two compartments accessible from both ends of the building, and having bathrooms and conveniences attached. Linen cupboards and stores for clothing are provided. All the rooms in the school and science department are to be well lighted and ventilated, and in addition to open fireplaces will be heated with hot water on the low-pressure system. The buildings will be built of red bricks with Broseley red tiles for the roofs, with stone dressings sparsely introduced for the string courses, window heads, &c., the floors being of wood blocks upon concrete, rolled steel joists being introduced in the upper floors. The drainage, water and gas supplies have been given especial attention. The grounds will be laid out for cricket, football, fives courts, &c., and planted as time admits. Messrs. J. Ward & Son, of Uttoxeter, are the contractors. The new buildings will be constructed in accordance with the plans of the architect, Mr. J. H. Pyke.

Broughton Parish Church has recently had a new tower and peal of bells added. The tower, which is a substantial erection of stone, has been built at the expense of Viscount Cross from plans prepared by Messrs. Paley & Austin, of Lancaster. The work in connection with it was carried out by local men, the walling being done by the late Mr. Joseph Balderstone and the woodwork by Mr. James Butterfield. The peal of bells are eight in number, seven of which have been cast by Messrs. John Taylor & Sons, of Loughborough, who have also fitted the same with mountings of the latest and most improved type. The tenor bell was cast by John Warner, and was given by Viscount Cross in 1869 in exchange for an old bell which had become cracked.

THE NEW ART GALLERY AT NEWCASTLE.

LAST week the foundation-stone of the new art gallery to be erected in Higham Place, Newcastle, was laid. The site has been provided by the Newcastle Corporation, whilst Mr. Alexander Laing will, on completion of the structure—which is estimated to cost £20,000—hand it over to the municipality. The site adjoins the free library. The buildings will be two storeys in height, forming on the plan a hollow square: the ground floor consisting of large entrance and sculpture hall and three lofty art or museum galleries extending through behind the public library and lighted from the central court, the upper floor being entirely taken up with top-lighted art galleries, four in number, averaging in size about 65ft. by 27ft. by 27ft. high to the top of the arched ceiling. The main facade is to Higham Place; the corner formed with the free library at the south-east angle is occupied by a tower 23ft sq. and 112ft. high, which contains the grand staircase. The staircase is reached from the sculpture hall, the main entrance to which is about the centre of the Higham Place front. The whole of the floors throughout will be constructed of concrete; in the case of the upper floors, combined with expanded metal on steel joists. The surface of the floor to the entrance hall is to be of tessellated marble pavement, and that of the galleries of polished oak blocks. At the north end of the buildings are provided receiving-rooms, private staircase and picture hoist. The design externally, carried out in polished ashlar, is Renaissance in style, boldly treated, the ground floor forming a rusticated plinth the same height as that of the free library, and upon which are detached Ionic columns projecting out on either flank and carrying the entablature with semicircular arched pediment, under which are sculptured niches. The general height is about equal to that of the library. The main entrance is 8ft. wide, flanked by double detached Doric columns with pedimented entablature and with sculptured figures on either side. Over the arch of the doorway is formed a niche with moulded architrave and twisted shafts on either side. The tower has a deep band of sculpture on the exposed faces immediately under the lantern, the latter being octagonal on plan and supporting a stone dome of about 20ft. diameter. The system of heating and ventilation is that known as the Plenum, the fresh air being driven into the various apartments through trunks and ventilating shafts by means of a fan in the basement, after being purified by passing through a coke screen. In cold weather the fresh air before being delivered into the rooms will pass over a steam battery, also in the basement; the temperature being regulated by valves which permit the cold and warm air to be combined to any desired extent. The inlet-gratings in the rooms will be so arranged as to be entirely clear of the picture surface. Messrs. Cackett & Burns Dick are the architects.



COMPETITIVE DESIGN FOR MUNICIPAL BUILDINGS, DRESDEN. J. REUTERS, ARCHITECT. (*See p.* 1.)

A Y.M.C.A. BUILDING FOR ST. HELENS.

THE scheme for the erection of the new Young Men's Christian Association buildings for St. Helens has recently made considerable progress. In a limited competition for plans those of Messrs. Briggs & Wolstenholme, of Liverpool and Blackpool, who were the architects for the Gamble Institute at St. Helens, have been accepted. The building will be erected on the plot of ground which adjoins the gymnasium, facing North Road and the corner of Duke Street. The site comprises 535 superficial yards, and the building will be in the Renaissance style. The principal feature of the ground floor will be an imposing main entrance 10ft. wide, with two roomy shops on the Duke Street side and five others facing North Road. Through the main vestibule will be a spacious entrance hall, through which entry will be obtained to the present gymnasium. On the first floor there will be first reached an open reception hall, leading to the various rooms. On the left an entrance will be made to the gymnasium gallery, next the secretary's office and private room. A reading-room will look out on the corner of Duke Street, while immediately over the entrance will be a library and parlour for writing purposes. On the right, extending to the end, a lecture hall which may be divided into three by folding doors is planned. The platform will have a permanent lantern screen at the back, and a speakers' ante-room is attached. On the second floor there is to be a lecture-room the same size as the present assembly-room, together with numerous other smaller rooms for caretakers, &c. On the roof flags will extend the whole length at the back, one part of which is intended for a keeper's yard and the other for a roof garden, which will make a retreat in the hot weather.

NEW PRUDENTIAL ASSURANCE BUILDINGS AT BRISTOL.

THE Prudential Assurance Company's new buildings at Bristol form a very conspicuous feature of Clare Street. They occupy a frontage of 43ft. in Clare Street and 35ft. in St. Stephen's Avenue, and also have a frontage facing St. Stephen's Churchyard which is equal to that in Clare Street, so that the offices which they contain are well lighted from three sides. Taking advantage of the position a symmetrical front has been arranged on the St. Stephen's Avenue end flanked by a tower at each angle of the site. The entrance is in Clare Street and leads both to the offices of the Prudential Assurance Company, who occupy the whole of the ground floor and basement, and also by means of a staircase to the suites of rooms on the upper floors which are to be let to various tenants for ordinary professional purposes. The offices of the company are lined with glazed faïence, executed by Mr. A. Whitehead, of Leeds, and the joinery in all these rooms, including screens, counters, &c., is in walnut and mahogany.

Though the site of this new building is not a large one it has been found possible to arrange four good offices on each of the upper floors, together with the necessary lavatory accommodation and coal lift. The exterior elevation is composed of red bricks and terra-cotta, both supplied by Mr. J. C. Edwards, of Ruabon. The base up to the sill of the ground-floor windows is of red granite, supplied by Messrs. D. H. & J. Newall, of Dalbeattie. The roofs, which are worked up into a central feature round the chimney shaft, are covered with North-country slates. The style may be called Renaissance. The general contractors are Messrs. W. Cowlin & Sons, of Bristol. The constructional ironwork came from Messrs. A. Handyside & Co., of Derby. The wrought ironwork, stair balustrade, &c., were prepared by Messrs. Hart, Son, Peard & Co., and the mosaic floors by Messrs. Patteson, of Manchester. Messrs. Belshaw & Co. carried out the electric lighting, and Messrs. A. Walker & Sons, of Leeds, the concrete staircase. The remaining specialists engaged upon the building were—Messrs. Thuffrey & Co. for grates and chimneypieces; Mr. J. Gibbons for ironmongery; Messrs. Morrison, Ingram & Co. for sanitary fittings; and the Crittal Manufacturing Co. for casements. The architects are Messrs. A. Waterhouse & Son, of London, and the whole of the work has been carried out under the supervision of Mr. W. Brock, clerk of works.

New Patents.

These patents are open to opposition until September 24th.

1900. — Crematorium Furnaces. — 12,887. S. WILLOUGHBY, 28, Hyde Vale, Greenwich, and H. H. FOX, 39, Victoria Street, Westminster, S.W. The object of this invention is to effect cremation without the escape of smoke or smell. The crematorium furnace is built in a vault beneath the mortuary chapel, and the requisite heat is obtained from liquid fuel, oil burners being arranged at one end, or at both ends, of the furnace. The spire of the chapel may, if desired, be made to act as a chimney. In the floor of the chapel is a permanent grave, as it were, with a trolley at the bottom on which the coffin would be lowered and taken away.

Gulleys.—16,494. S. CHATWOOD, Crown House, Edenfield, near Bury. The gulley is provided with a ventilating chamber and air-pipe to carry off foul air and deliver it at a safe distance, so as to prevent it being forced through the water seal.

1901.—Combination Sink, Bath and Boiler.—12,296. H. H. HODKIN, Havelock Bridge Works, Queen's Road, Sheffield. This invention is intended for cottage property. It consists of a sink-slab of concrete supported on piers, with a copper boiler at one end heated by gas and a bath carried on rollers underneath. When required, the bath is pulled out and the boiling water allowed to run into it from a tap fixed at the bottom of the boiler. The bath is provided with a waste.

The following specifications were published on Saturday last, and are open to opposition until September 31st. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900. — 11,494, JETLEY, road-scavenging machine. 11,953, ATKINS, manufacture of acetylene gas. 13,239, FAJOLE, acetylene gas generator. 14,594, CULLIS & CULLIS, deal and timber transporter. 14,781, BOULT (*Kraetke*), ignition devices for incandescent gas burners, 14,820, GIBBONS, door stops. 14,822, TAYLOR & HUBBARD, excavating machines. 15,267, HILL, ball and float valve for cisterns. 15,822, BROUGHAM (*Weiss*), rotary cutters for wood· 15,874, BJÖRNSTAD, means for controlling electrically-driven lifts, hoists, &c. 16,770, LE MAITRE, wire nails. 17,120, PILKINGTON & ORMANDY, manufacture of bricks and mortar. 17,596, EADES & ALLDAY, crab winches and other appliances. 17,999, COGHLAN, acetylene gas generating apparatus. 22,694, DE LERY, incandescent gas lighting.

1901.—9,166, KELLY, KELLY & PRITCHETT, self-closing mechanism for doors. 10,334, GIEBELER, self-sustaining gear for lifts, &c. 11,045, PFISTER, preserving timber. 11,129, MUNK, device for cooling, moistening and purifying air. 11,353, KOYL, apparatus for softening water. 11,613, THORPE, closet joint connections. 12,749, GUTZWILLER, connecting pieces of parquetry. 12,751, HOOPER, hearth and fire-place fittings.

The Royal Exchange Pictures: Two More Ready—Under the auspices of the Mercers' Company and the Gresham Committee Messrs. W. Cubitt & Co. are preparing a panel in the south-east corner of the ambulatory of the Royal Exchange for the reception of the work of Mr. Edwin A. Abbey, R.A., which is a commission from the Skinners' and Merchant Taylors' Companies, and commemorates the founding of their annual feast. In the reign of Richard III. there occurred a dispute between the companies as to which should take precedence of the other at civic functions. Lord Mayor Billesden (1483) decreed that they should enjoy precedence in alternate years, and should dine together, in token of amity, on the eve of St. John's Day. It is expected that Mr. Abbey's picture and that of Mr. Frank Brangwyn, "Modern Commerce," will be unveiled by the Lord Mayor before his expiration of office.

BIRMINGHAM UNIVERSITY.

The Birmingham Architects' Plea for an Open Competition.

AT the last meeting of the Birmingham City Council, Alderman Beale, Vice-Chancellor of Birmingham University, stated that the misunderstanding with regard to the Birmingham architects was due to a difficulty with Lord Calthorpe. The peculiar conditions under which his lordship gave the site provided that he should approve of everything done, and the promoters had actually to ask Lord Calthorpe to go and see the architects and let them know what he approved of and what he wished. The Birmingham Architectural Association, respecting this, says: "Seeing that the official reply received from the secretary to the University to our protest was 'that in the opinion of the University Council the principle of selecting designs by competition could not be advantageously adopted in the case of the University,' we (the secretaries) are instructed to ask you if you will be good enough to say how these two statements can be reconciled." Alderman Beale replied to the effect that he gave the requirements of Lord Calthorpe as one only of the circumstances which were inconsistent with the principle of competition. "It would not have occurred to me," he continues, "that my statement and the resolution of the University Council required reconciliation. The principle of competition cannot, in my opinion, be advantageously adopted under conditions which impose undefined limitations on the competitors and restrict the freedom of the selecting authority, and this applies to any case where a general power of veto is in the hands of a third party. It should be understood that Lord Calthorpe is relaxing the restrictions which he has heretofore insisted upon for the protection of the lessees of the Edgbaston Estate, but he informs us through his agent that he cannot say to what he may have to object until he sees what is proposed. His approval should, therefore, be secured in the earliest possible stages, and I think it would be impossible to do this in the case of an anonymous competition."

This letter was laid before the Council of the Birmingham Architectural Association, who considered that neither the indefinite opinion expressed by the Council of the University nor the more definite statement given by Alderman Beale at the City Council meeting was a valid reason why an architectural competition should not have been promoted with a view to securing the best design for the new University buildings—because:—

(1) Although the Council of the Birmingham Architectural Association fully appreciate the ability of Messrs. Webb & Bell they believe it is a fact that hitherto they have by no executed work proved their powers in connection with University buildings, whereas other architects have done so with marked success.

(2) Funds for the purpose of the University having been obtained publicly and to a large extent from those connected with and interested in Birmingham and its neighbourhood, the subscribers would naturally desire to give local talent the opportunity to distinguish itself—in proof of which no less than ninety subscribers have sent replies in the affirmative to a circular issued by the Birmingham Architectural Association, and not a single negative reply was received.

(3) Although Lord Calthorpe in presenting a site for the new buildings has a perfect right to lay down conditions, it is scarcely to be supposed that, as his lordship draws so handsome an income from property within the city boundaries, he would desire that such conditions should exclude Birmingham architects from the chance of carrying out the proposed buildings.

(4) As it need have taken no longer time to have procured competitive designs than is likely to be required by a single firm of architects engaged on many important works, the approval of Lord Calthorpe could have been as readily obtained.

(5) Any objection which Lord Calthorpe is likely to make would be for the protection of the lessees of the Edgbaston Estate. Many Birmingham architects who have been employed to erect buildings for such lessees would be better acquainted with the requirements than an alien firm of architects.

(6) However valuable an acquisition Lord Calthorpe's gift of land may be, it is small in comparison with the total sum subscribed, and is in fact less than other individual donations to which no such conditions are attached. It is therefore unreasonable that any objection Lord Calthorpe may have to make should be put forward in opposition to what many subscribers consider would be beneficial to the undertaking.

Further, the Council point out that, if an architectural competition were promoted conditions might be sufficiently defined for the purpose, and the freedom of the selecting authority need in no sense be restricted, "because it is recognised that architectural competition is for the purpose of securing the best considered scheme, and promoters can always provide for any necessary revision of the selected design."

Engineering Notes.

Profitable Municipal Lighting at Bradford.—The municipal accounts of Bradford for the last financial year show a profit of nearly £200,000. The most paying item would appear to be municipal lighting. The gas and electricity are responsible for a profit of £59,000 on an expenditure of £210,000. In Manchester the corresponding profit is nearly £52,000.

The New Street Bridge over the Tyne, between Newcastle and Gateshead, which has been completed at a cost of £80,000, was opened last week. The new structure was built round about the old bridge, which was removed piecemeal, the traffic being thus allowed to continue without interruption. The engineers were Messrs. Sandeman & Moncrieff, Newcastle, and the contractors Sir William Arrol & Co., Glasgow.

Engineers' Congress at Glasgow.—In connection with the Glasgow Exhibition an International Engineering Congress will be held at the beginning of September. The delegates of foreign Governments and members will be received in the Bute Hall of the University by the president (Mr. James Mansergh, F.R.S., president of the Institution of Civil Engineers), on the 3rd. The congress will terminate on September 6th.

Quick Waterworks Boring.—The record for large water borings, which has hitherto been held by Gainsborough (Lincolnshire), is about to be challenged by Lincoln itself. The corporation of that city recently invited tenders for a boring 2,176ft. deep, lined with 30in. tubes for a depth of 400ft. and terminating not less than 12in. diameter. Seven tenders were received for the work, and the corporation, on the advice of the engineer, Mr. Percy Griffith, A.M.I.C.E., F.G.S., of Westminster, have accepted that of Messrs. Charles Chapman & Sons, Ltd., of Salford amounting to £14,605. The time allowed for the completion of the work is four years, but it is anticipated that a shorter period will suffice.

New "Tubes": The Great Northern and City Railway.—Two important underground electric railways are being constructed in London. One will run between Baker Street and Waterloo, and the other will connect the Great Northern Railway system at Finsbury Park with a station at Finsbury Pavement. Of the two the latter is more nearly completed. It was commenced in December, 1898, and so far as tunnelling is concerned it is now practically finished. Some time this month the contract for the electrical equipment of the line will be signed, and it is confidently hoped that passenger traffic will be possible next June. The new line will be about 3½ miles long. It is connected with the Great Northern main line at Finsbury Park. The City terminus is opposite the Moorgate Street station of the City and South London. There will be five stations, those in Old Street, Essex Road and Drayton Park, and the two termini. The two tubes vary in depth from between 60ft. to 90ft., the railway in the vicinity of the Essex Road station being the deepest part. It may be added that the tunnels are exceptionally broad, and will permit the passage of the ordinary Great Northern rolling stock. To prevent or minimise vibration, the lower half of the tunnels is built of concrete and brick, while the upper portion has a "roof" of iron.

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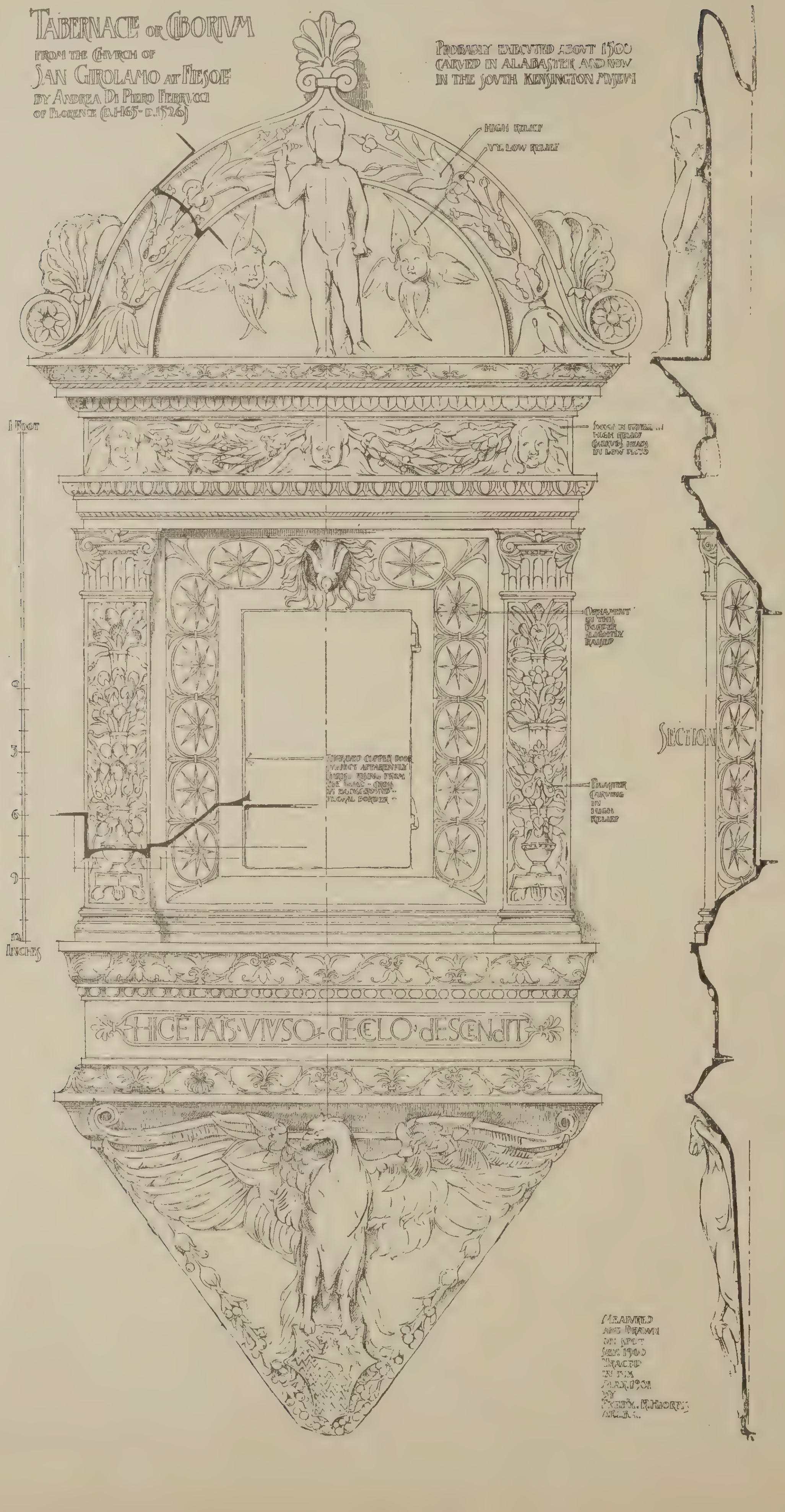

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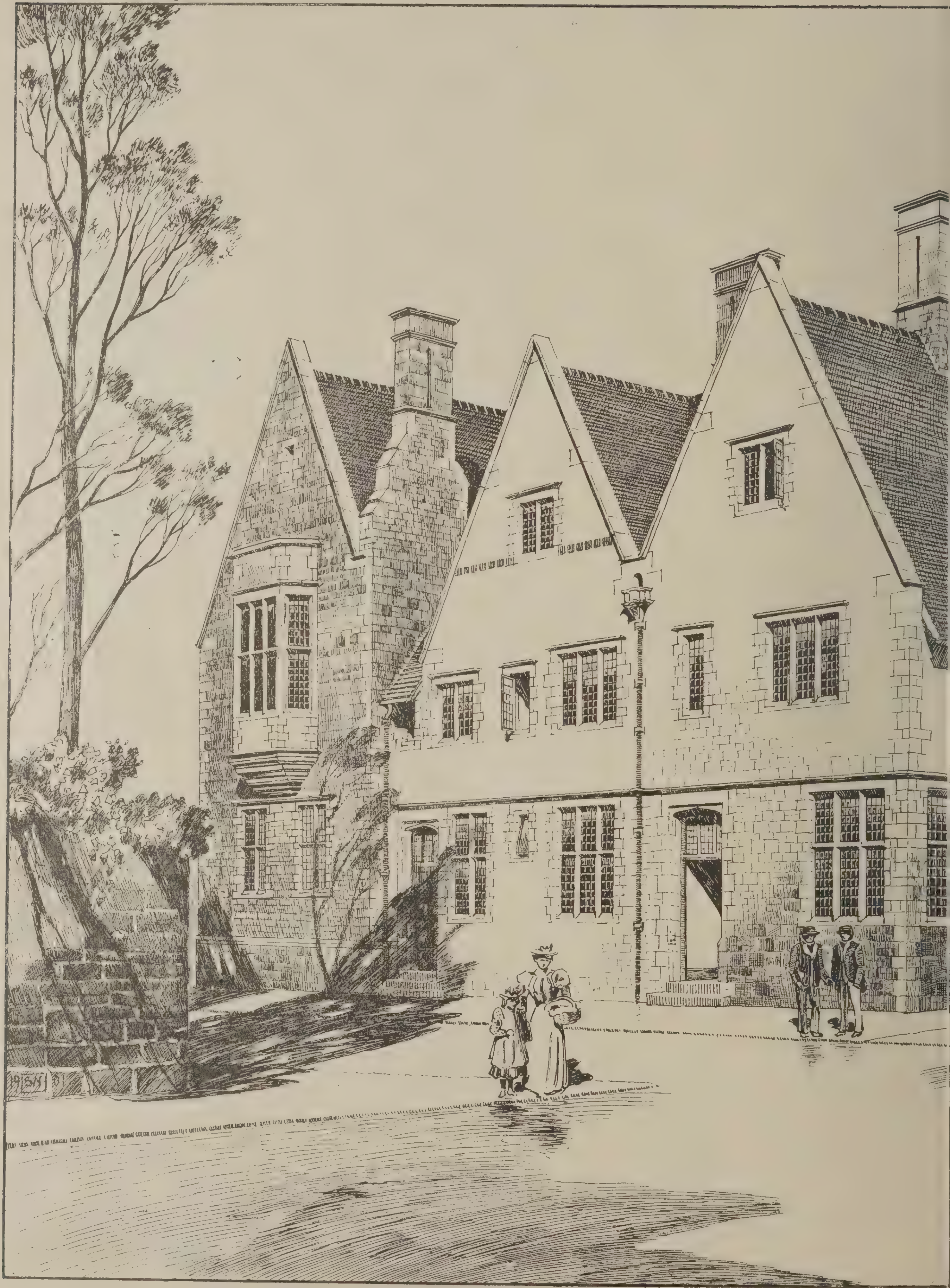

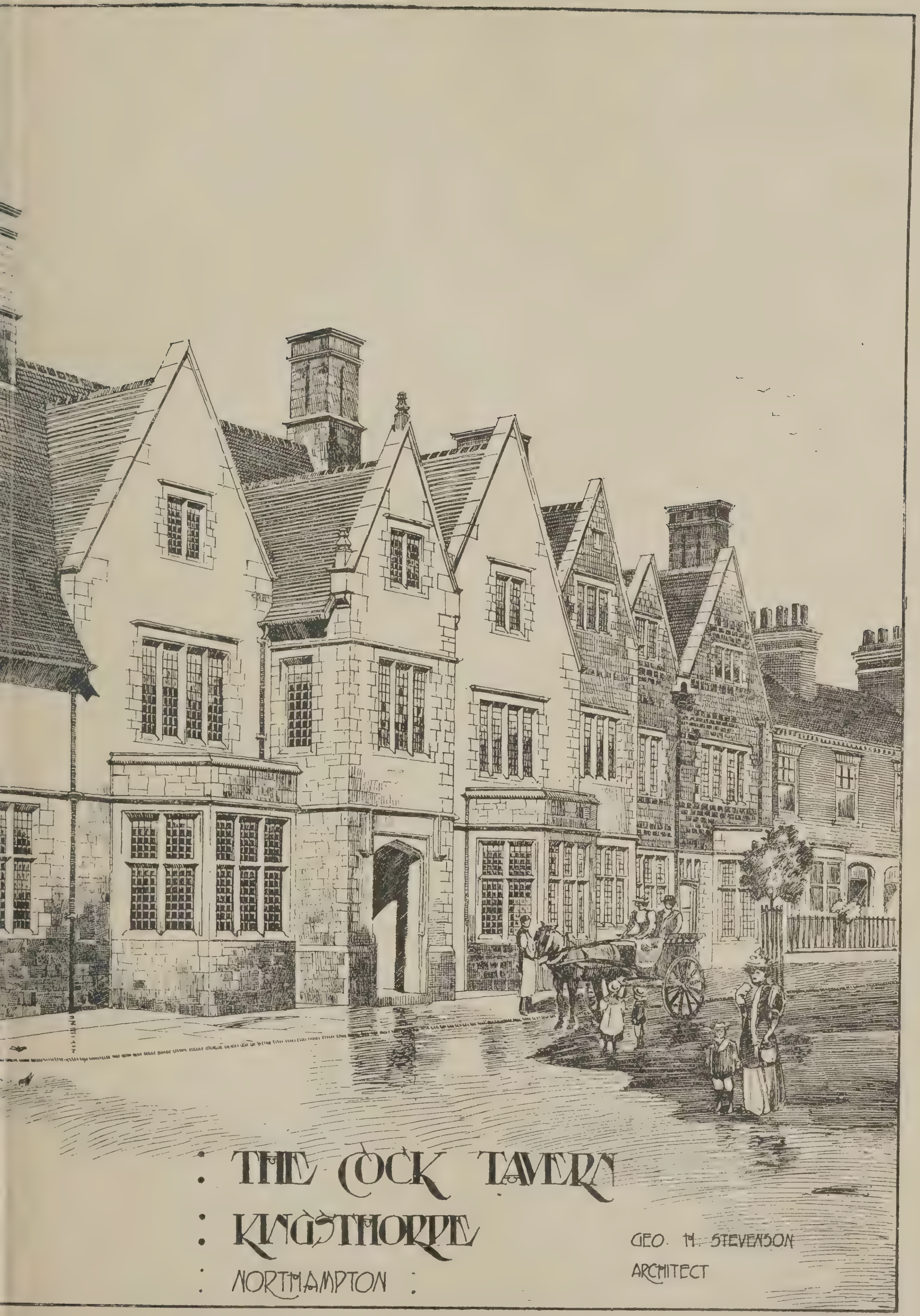
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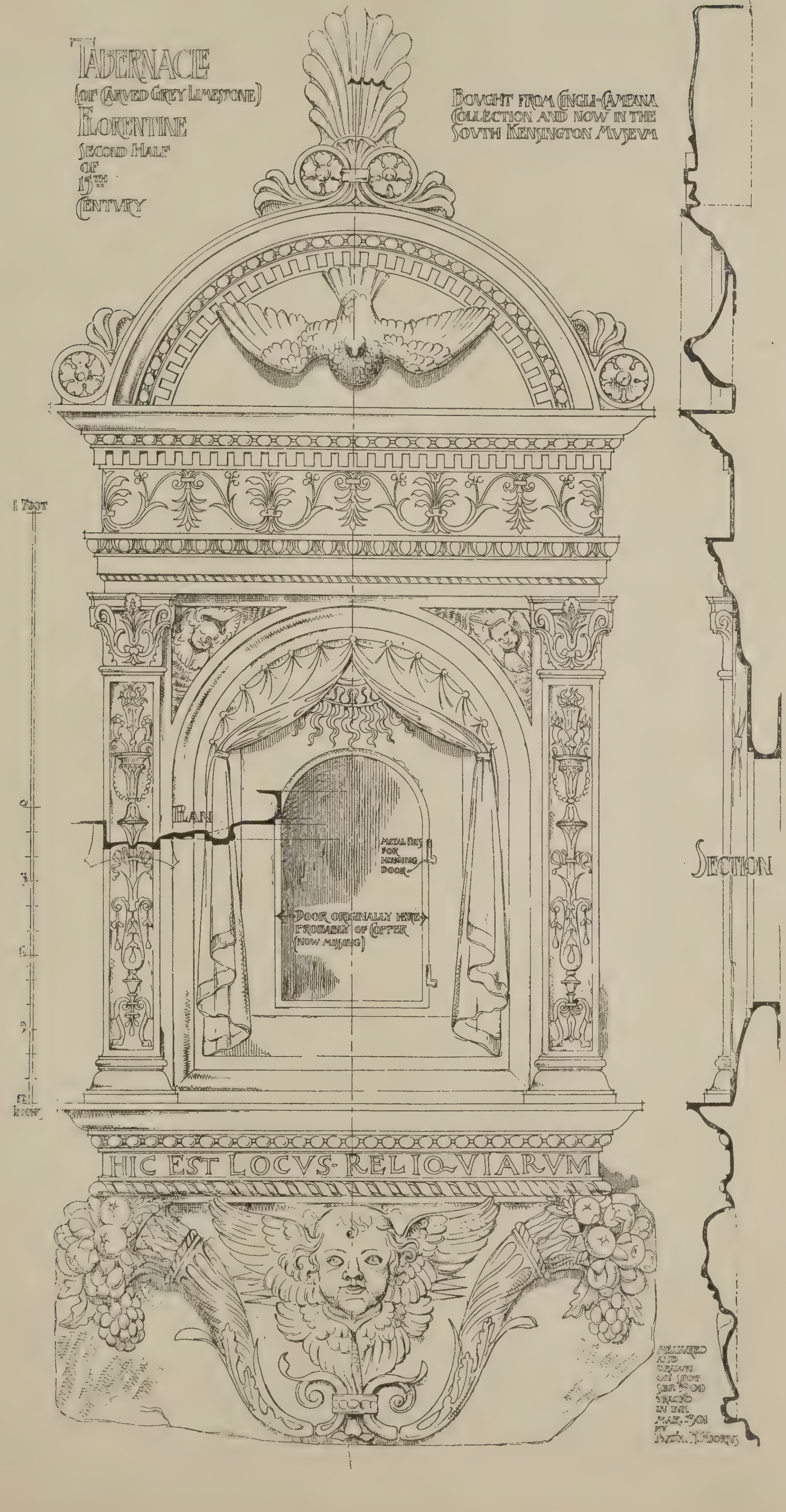

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Regilding Baths.

WITCHAMPTON.—E. T. writes: "I am about to re-enamel and regild some baths for a nobleman's house. I find that leaf-gold put on to the usual gold size will not stand hot water. Can you suggest something?"

Use japanners' gold size and gold leaf.

W. J. P.

Nuisance Caused by Surface Water.

CREDITON.—J. E. B. writes: "About twenty-five years ago A. rented a garden, the entrance to which was through a private roadway between two houses. This road was divided in the centre by a board partition about 6ft. high. About twenty-three years ago A. raised the ground on one side of the partition in order to enable him to take in his horse and trap. Some years ago the partition fell down and was replaced by an iron railing. One-half of the road now being lower than the other, A. received notice to give up his garden. After being out of possession about eighteen months, he received notice from B., the adjoining owner, to abate a nuisance caused by water from the garden getting into B.'s property. Is A. liable? B. bought his property many years after A. had raised the road."

A. is not liable. B. came to the nuisance, buying his property after A. had raised the road, and thus accepting the condition of affairs then existing. G. A. T. M.

Erecting a Shed.

LONDON, S.E.—A. E. B. writes: "At the side of my house there is a piece of land 13ft. by 26ft., obviously kept back for the line of frontage. It is enclosed by a 9in. brick boundary wall 7ft. high. I wish to erect a wooden shed to the height of the wall. Shall I have to obtain special permission?"

Permission to erect the proposed shed must be specially obtained from the County Council, but it is very doubtful if it would be granted for a wooden structure. On the other hand, if it could be so planned as to be a bay window and its total projection limited to 3ft., it could be erected without special permission. G. A. T. M.

Re-drawing Sheet for R.I.B.A. Intermediate Examination.

KETTERING.—LEIGH writes: "In the testimonies of study for the above examination I have done one of my sheets, Fireproof Flooring (particulars taken from an old Kalendar), in isometric projection and to a scale of 1½in. to the ft., but I find on procuring last year's Kalendar that it is altered, and that ½in. to the ft. is the scale given, with no isometric projection. Will it be necessary for me to redraw that sheet, as it is coloured and complete?"

The sheet need not be redrawn, but a letter of explanation should accompany it. G. A. T. M.

Drawing Papers.

WHITFIELD.—MANCUNIAN writes: "In preparing the R.I.B.A. testimonies of study what kind of paper would you recommend, hot-pressed or ordinary? Kindly state for what purpose each is prepared."

Hot-pressed drawing paper is that which has been rolled between heated rollers in order to give it a smooth surface. It is most suitable for pen or fine pencil work; but when the paper is damped with wash or for the purpose of stretching it on the drawing board the smooth surface is generally removed in part, returning somewhat to its first state. The ordinary surface is the only really safe one to use for colour- or wash-work. We should advise you to use both kinds of paper, each where it is best.

Price-Book for the North of England.

MANCHESTER.—F. S. writes: "I have heard it said that Laxton's price-book is far too high for the North of England. If this is so please name a suitable price-book for the North."

We know of no price-book that is suitable for the North of England, nor do we believe there is one. The ordinary price-books are only useful for pricing trade specialities, and then discounts, sometimes as much as 75 per cent., need to be allowed for; but the prices for ordinary every-day materials and goods must necessarily be of little or no use in different localities, and even then the prices for imported and manufactured goods fluctuate from week to week. We can only advise you to obtain quotations from several sources in the district, or ask some estimating clerk or builder who knows the local circumstances well.

Scientific Masonry.

LEICESTER.—CHISEL writes: "Kindly name a good book on masonry and stone-cutting. I want a book that will be of assistance in the preparation of detail drawings, particularly in the construction of domes and vaulting, showing the best method of projecting and determining the sizes of the stones."

Scientific masonry is founded upon the universal principles of mechanics, physics and chemistry, and we know of no book adequately dealing with the elements of the science. To properly design stonework one needs to be acquainted with the three branches of science we have named, and also to have practical acquaintance with the working of stone in order to know the economical and logical treatment of the various kinds. Of course stone was worked in the past (and to a small extent at the present time) by practical men without theoretical knowledge, proportioning the stone by experiment to suit the requirements of each particular case, and not by general rules found from comparatively few experiments. For this rule-of-thumb method to be used to perfection the craft must hand the knowledge down from man to man traditionally. But, for good or ill, the traditions of building have gone for the nonce, and we must now use scientific methods. The disadvantage of relying upon scientific rules alone is apparent, however, when we consider that much Gothic masonry judged by modern engineers' formulæ would be unstable, although it is clearly right, for Gothic constructions have stood for many centuries. The reason of this is that engineers, and architects for that matter, specify sizes by formula, using a factor of safety to cover the variation in quality of the same material and to allow for small flaws, &c., whereas a practical man would carefully pick out and choose the material according to his several requirements and vary his proportions to suit his material, thus avoiding wasteful use and obtaining a true proportioning. We would advise our correspondent if possible to leave the detail of his masonry to a craftsman who has made a scientific study of it. If this is not possible the following books will be found of some use: "A Treatise on Masonry Construction," by Ira O. Baker (21s. nett); "Modern Stonecutting and Masonry, with special reference to the making of working drawings," by John S. Siebert and F. C. Biggin (6s. 6d. nett), and "The Rudiments of Masonry and Stonecutting," by Edward Dobson (2s. 6d.). The latter deals with the principles of masonic projection and their application to the construction of curved wing walls, domes, oblique bridges and Roman and Gothic vaulting. For the principles of applied mechanics "Rankine's Manual" (12s. 6d.) is the standard work, but for the study of this subject a knowledge of higher mathematics must be possessed. These books can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C. Five articles on "The Construction of Five Famous Domes," by John A. Marshall, appeared in Vols. VI. and VII. of the BUILDERS' JOURNAL, and a reply to an enquiry on stresses in domes by the same writer will be found on page 439 of our issue for January 9th last. H. K. D.

Fungus Growth on House.

NORTH WALES.—PENSARN writes: "Can you state how to destroy and prevent a fungus growth on the cemented surface of a house near the sea-coast? The house in question is situate at the end of a terrace built about thirty years ago by various owners and builders, and is the only one so affected, and whilst the surface appears sound and hard this growth exudes in disfiguring patches of a dark-brown colour. Some attempts have been made to remove the disfigurement by washing with carbolic acid and colouring, but the fungus throws off the colour and reasserts itself. The aspect is north, west and south, the north side being most affected. Sea-sand has no doubt been used in mixing the cement."

I fear this is one of those unfortunate cases where "prevention is better than cure," and that nothing short of stripping and re-cementing the wall will be of any permanent benefit. Painting or colouring the spots will be of no use whatever, as nothing save the total eradication of all the spores will stop a fungoid growth when once established. The only suggestion I can make is that the fungus should be removed at frequent intervals, thus minimising the disfigurement. I presume it would give the house a strange appearance were the walls all coloured brown to match the fungus.

G. S. M.

Footings.

LONDON, W.—FOOTINGS writes: "Wishing to build close up to the boundary line of a site adjoining the garden of another property, and separated from it by a wooden fence, and the building by-laws of the district (not the London Building Act) requiring footings on both sides of the wall—(*a*) have I a legal right to dig into and place the footings of my wall on the adjoining owners' land? If not, (*b*) what is the custom in such cases?"

You have no legal right to place the footings of your wall on the adjoining owner's land, but under ordinary circumstances the adjoining owner frequently allows the footings to project upon his land. This, however, is purely a matter of arrangement. T. E. C.

Building Patents.

ROADE.—A. S. writes: "Where do I need to apply, and what steps have I to take, in order to obtain a patent for a small article for the building trade?"

Apply to the Comptroller-General of the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C., for the necessary forms. You can either obtain provisional protection or letters patent for your invention. The stamp duties are respectively £1 to £4. Provisional protection is valid for nine months, letters patent for fourteen years, the latter however requiring a yearly fee to be paid in order to maintain the patent. We might refer you to the articles on patents which appeared in our issues for November 15th, 1899, and March 14th, 1900.

Registration of Architects.

DERBY.—X. Y. Z. writes: "I entered into partnership eighteen months ago after having served a three years' pupilage. How should I be affected by the passing of the Bill for registering architects?"

MANCHESTER.—B. B. F. writes: "I served my 'time' with a provincial architect, who agreed to take me without a premium. There was no agreement or indenture prepared. I stayed with him 3½ years and have since been almost four years an assistant in a good office here. If the Bill passes, shall I be at a disadvantage, having no written evidence of having been in the profession almost 7½ years?"

The object of these "Enquiries Answered" is to supply information which will be useful to readers, and, though the questions be legion, we always endeavour to render as much help as possible. In former issues we have devoted considerable space to the suggested registration of architects, and on several occasions we have replied to specific questions affecting the Bill. As there are at present no indications of the Bill becoming law, it seems to us useless to continue to answer various questions which might arise *when* the measure was passed. Even assuming that it had been entertained by Parliament, changes might be made in its provisions which might entirely upset any replies given on the Bill in its present state, and as questions might be raised *ad nauseam* we consider it simply a waste of time and space to continue to publish replies to them.

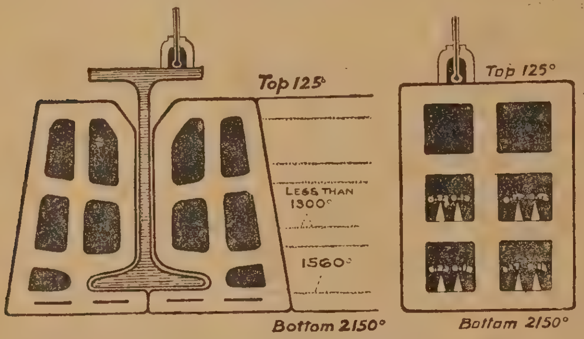
RATIONAL METHODS OF FIREPROOFING.

By W. C. FURBER.

THE experiments of James E. Howard indicate that steel has its maximum strength at about 400 degs. Fahr. Howard's experiments show that the strength is affected also by hardness of the steel, the hard steel having a higher resistance than the soft steel; thus he found that 10 per cent. carbon steel had a strength of 20,000lb. per sq. in. at 1,000 degs. Fahr., and ·60 to 1·00 per cent. carbon steel had the same strength at 1,600 degs. Fahr. These facts teach us that in order to preserve the integrity of the structure the temperature of the framework should not be allowed to greatly exceed 400 degs. Fahr.

Fireclay is a native combination of the hydrated silicates of alumina, mechanically mixed with silica and alumina in various subdivisions, and sufficiently free from the silicates of the alkalies and from iron and lime to resist vitrification at high temperatures. According to the authorities, fireclay contains from 47 to 80 per cent. silica and from 17 to 48 per cent. alumina. Fireclay is probably the most durable substance that can be applied to the protection of ironwork from heat. The knowledge, however, of its virtues has frequently led architects and manufacturers to decrease the thickness of the covering of the ironwork to a point where it no longer answers its purpose in a satisfactory manner.

Since the substitution of ironwork for brickwork in the structural parts of a building, the tendency has been to restrict the space occupied to the minimum, and this has resulted in begrudging every inch required for fireproof covering, and as a consequence in such cases the fireproofing is no longer of sufficient thickness to fully insure that the ironwork will be properly protected in the event of great heat.



EXPERIMENTS TO DETERMINE THE TRANSMITTING POWER OF HEAT THROUGH HOLLOW TILES.

The skeleton building has reduced the area of piers and columns to such a small part of the area formerly required that the other extreme has been reached in making the sections of the minimum dimensions, with the least possible allowance for thickness of fireproof covering, and as a result of this at least some of the so-called fireproofing is a mere pretence; for while it is true that the covering is fireproof in the sense that it is non-combustible and almost indestructible itself under trying conditions, yet it is not thick enough to afford insulation to the metal within it, to preserve it; and the term "fireproof" has become, therefore, a misnomer. In those instances where buildings have been subjected to severe tests and failure has resulted the unthinking critic has condemned the system of fireproofing, whereas the method only was at fault.

The necessity for dead air space cells makes it more difficult to insulate the structural work by preventing any considerable conduction of heat from the point of application. A glass lamp chimney is kept below the melting point of glass because the heat of the flame is rapidly carried away by the upward current of air and by radiation, while if the heat were stored in it it would soon reach its melting point. The column and beam, not being able to give up their heat by conduction and radiation, store it up, and are therefore placed in an unfavourable position compared with the lamp chimney. The dead air space cells, however, play a very important part in fireproofing, and are highly effective in the non-conduction of heat. Some authorities give the thermal conductivity of air as $\frac{1}{3500}$ part of that of iron; the data relating to these matters, however, is not complete, nor is that which is in existence in a very satisfactory state. The value of dead air spaces, however, is very great, and the use of air-cells in terra-cotta fireproofing is essential. Fireclay with air-cells has many times the value of the solid material; it is evident, therefore, why they should be used in fireproof coverings.

The value of air-cells as a non-conductor of heat is shown very clearly in the accompanying illustrations, and will bear study by designers and manufacturers. Volumes might be written as to the behaviour of fireproofing under tests, but these illustrations contain more practical information than pages of general description of how a particular accident occurred, and why one place failed when another did not.

These experiments show that after a test of twenty-five hours, with a final temperature of 2,150 degs. on the outside of the floor tile, a temperature of 1,560 degs. was found in the first cell adjoining the outside 1in. of terra-cotta wall, and while twenty-five hours is a very severe test (for if time enough be given the whole mass would attain the same temperature) yet the reduction of heat is not sufficient to have maintained the full strength of the beam even for a short time.

The temperature in the first air-cell is 1,560 degs. Fahr. If this temperature is obtained here, it is evident that the lower flange of the I-beam, which has not as much protection, is considerably hotter, and as the temperature of the iron should not be allowed to greatly exceed 400 degs. it is apparent that this beam has lost a great part of its strength temporarily. The second cell shows a very much greater reduction in the temperature, and the top of the block shows a comparatively low temperature. The great capacity of the iron to absorb and transmit heat is shown in the temperature of the top flange of the beam, which is much higher than that of the terra-cotta. While this experiment was evidently made without scientific precision, yet it answers the purpose in an admirable way as illustrating the progress heat makes in going through the floor.

The cellular construction used in the body of the ordinary floor tile is wholly omitted about the flanges, and this is shown to be a mistake. The reason it is omitted is because it would make the floor thicker than usual, and this means that the building must be made higher, because the floor thickness would be increased.

The protection the beam should have is, of course, determined by the maximum temperature to which it is likely to be exposed, but in conflagrations temperatures of 2,500 degs. Fahr. are easily obtained.

S. Albert Reed estimated that the temperature of a fire at a lard refinery at 59th Street and Eleventh Avenue, New York, was 5,000 degs. In the tests made by the committee of Fire Insurance Underwriters the Architectural League, and the American Society of Mechanical Engineers in 1896, the committee decided to make tests on the following basis: 2,500 degs. for six hours, representing a conflagration; 1,200 degs. for one hour, representing a mild external fire; 700 degs. for one half-hour, representing a mild condition such as might occur in an office building or dwelling.

The building, to be effectually fireproof, should be capable of resisting the probable maximum temperature, and assuming that to be 2,500 degs. the ordinary covering is not sufficient. It is quite possible to cover metalwork in buildings so that the application of great heat for a short time shall not injure it, but in order to ensure this the covering must be thick enough.

The firebrick lining of steel-melting furnaces is about 12½in. thick; the temperature of melting steel is about 2,900 degs., or 12½in. of firebrick is required to insulate 2,900 degs. of heat. This thickness of lining insures that the hot steel shall not be chilled from the outer air, and also that the iron covering of a Bessemer converter shall not be reduced enough in strength to prevent it answering as a constructional envelope. This practical example gives us some basis for arriving at the thickness of covering necessary to protect the structural parts of a building.

The conditions of exposure, however, are greatly in favour of the steel converter or the open hearth furnace in this respect, that in these instances the heat is conducted or radiated away from the outer walls into large volumes of air of ordinary temperature, which keeps their surfaces at a temperature corresponding to the capacity of the surrounding air to absorb it; while with a beam or column in a building little or no opportunity can be afforded to conduct the heat away because the air spaces must be "dead"—that is, they must not be continuous in order that under no conditions they could act as flues to conduct heat and fire along their length and thereby defeat their purpose as a protective covering.

In buildings a covering of 1in. of porous terra-cotta is all that protects the lower flanges of the I-beam; the girders usually have a trifle more or a total thickness of 1½in. to 2in. covering.

The experiments of Howard and others show that steelwork to preserve its integrity should not be allowed to attain a temperature exeeeding 400 degrees; 1in. to 2in. of terra-cotta cannot prevent this. It is probably true that manufacturers are not wholly responsible for the thinness of their covering, but are compelled to follow the footsteps of the original designers, because architects have been accustomed to the previous shapes and forms and will not make any changes in the direction of increased thickness, and if this is true the responsibility for the present insufficient methods must rest upon the architect's shoulders. Manufacturers cannot be expected to make things they cannot sell, and if the thin coverings are the only kind they can dispose of then they are in a commercial sense blameless; nevertheless, a moral responsibility rests upon them to prove to their patrons the necessity for a greater thickness of covering to ensure the result striven for.—From the "Brickbuilder" (Boston, U.S.A.).

Masters and Men.

Swansea Strike Ended.—After a strike of more than fifteen weeks the Swansea builders' labourers have agreed to return to work on the old scale of wages, by which they receive 5½d. per hour and scaffolders 6d. The skilled-labour element, tired of the struggle, had practically seceded from the federated trades and weakened the men in their demands.

The Royal Botanic Society's Garden in Regent's Park has been secured to that body for a further term of thirty-one years by lease granted by the Department of Woods and Forests. New club-rooms are to be built and a garden school formed.

One Contractor or Several.—At the last meeting of the Leeds City Council the question of letting the contract for the Seacroft Hospital Extensions, which involve an expenditure of nearly £200,000, came up for consideration. The chairman of the sanitary committee proposed that the work be let to one contractor, and that clauses be inserted in the conditions of contract providing for the letting by such contractor of various trades to master tradesmen to be approved by the committee and protecting such tradesmen as to payment for work done. An amendment to refer the matter back with a view to the contract being split up was carried. The sanitary committee further considered the matter, when a letter was read from Mr. Hall, the architect, stating that the proposed alteration would entail considerable delay. The committee, however, decided to instruct him to prepare quantities in separate trades in accordance with the decision of the council, but the chairman states that this will not preclude anyone tendering for the work as a whole. When the extensions at Seacroft have been completed the sanitary committee will next have to consider the erection of a small-pox hospital at Killingbeck, which is calculated to cost £66,000.

Bricks and Mortar.

APHORISM FOR THE WEEK.

You have had your education at Westminster; and doubtless among those dim aisles and cloisters you have gathered much of that devotional feeling in those young years, on which your purest mind feeds still—and may it feed! The antiquarian spirit, strong in you and gracefully blending ever with the religious, may have been sown in you among those wrecks of splendid mortality.—CHARLES LAMB.

Our Plates.

THE two examples of Italian tabernacles—both of which are Florentine work—belong to the latter part of the "early" period of the Italian Renaissance. They exhibit a great variety and richness of carved detail executed with the characteristic skill and taste of the "sculptor-architects." The larger of the two, from the church of San Girolamo at Fiesole, is of alabaster, 5ft. 7in. by 2ft. 5in. in extreme dimensions. It was purchased by the South Kensington Museum authorities for £450. The tympanum of the pediment contains the Child figure with right hand raised in the ecclesiastical process of benediction; the Dove enveloped in flame-like rays—presumably emblematic of the Holy Spirit—appears immediately over the engraved copper door, and the carved eagle at the base is the symbol of St. John the Evangelist. The use of the "tabernacle" in Catholic ritual, viz., to contain the sacred elements reserved from the Sacrament, will be generally known, and it holds a position over the altar. The smaller example is in many respects similar; the Dove occupies the tympanum, and the flame rays occur at the junction of the curtains (carved) to the sides of the door. The stone is a fine granite grey limestone. The two drawings are by Mr. Frederick R. Hiorns, A.R.I.B.A.

A Short History of the Salon.

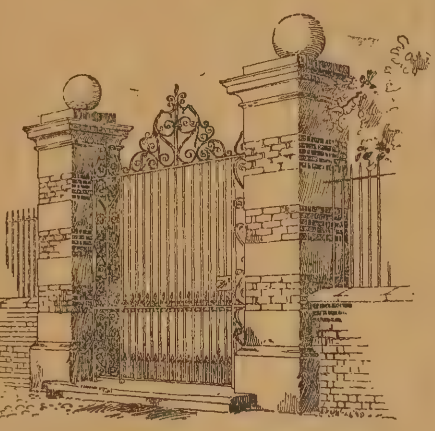
IN the August number of "Lectures pour Tous" there is an interesting article about the pictures and sculpture rejected by the Salon during last century. The Salon, it begins, was founded in the seventeenth century, and has been held at intervals ever since. Previous to its inauguration artists were obliged to exhibit their works in the open air. It has been installed in several places—in the Louvre, Palais Royal, Orangerie des Tuileries, Palais de l'Industrie, Champ de Mars, and finally in the magnificent Grand Palais des Champs Elysées. Up to 1830 the professors at the Academy decided that students should represent only one human type. For example, the brow and nose should join in a straight line. There should be a certain distance between the mouth and the chin, the eye and the ear, &c. Antiquity had left models of harmonious movement. Consequently the artist was not allowed to put too much action in a figure, nor was he permitted to express too much passion in the face. Each object represented had to be painted a certain colour in keeping with tradition. In short, the ideal was that of ancient statuary, good enough in itself but misplaced when followed in modern painting. At this time, however, a band of young artists, inspired by the success of the Romantics in literature, began to break away from academic convention. Life, passion and movement were the characteristics of the innovators. Delacroix painted scenes from "Hamlet" and "Lear," Rousseau went to the Alps and depicted them in their grandeur, and Barye chiselled groups of animals full of vitality. In 1836 the new school sent its works to the Salon, and their success or failure would mark a renaissance or a decadence. The moment was decisive for French art. But the jury, composed of members of the Institute, held up their hands in horror and rejected the whole lot. A scandal ensued. The young artists appealed to the public. The Duc d'Orleans and the king himself were dragged into the squabble. The Classics cried to the Romanticists: "Vous êtes des sauvages ivre," and they in turn replied, "Vous êtes des assassins." In 1837 the "Avenue des Châtaigniers," by Rousseau, was rejected, and the artist had great difficulty in disposing of it for 2,000fr.; ultimately Durand-Ruel purchased the picture for 27,000fr. In 1842 Corot's "Baptême du Christ" was refused.

Romanticists and Realists.

THE Revolution of 1848 brought about the downfall of the old jury of painting. Napoleon introduced a new jury composed of members of the Institute and art critics favourable to the new movement, and gradually the Romanticists assumed full sway at the Salon, they in their turn shutting its doors to the Realists, who began boldly clamouring for admittance. In 1859 Millett sent his "La Mort et le Bucheron." The members only saw brutality, and they refused it. In 1863 the works of the Realists were rejected *en bloc*, and so great was the indignation that the Emperor ordered all the works of art refused to be exhibited in a part of the Palais de l'Industrie, so that the public should decide between the jury and its victims, and the success of the show was so conclusive that a considerable reform was made in the composition of the jury. Henceforward three-fourths were to be elected by painters, the remaining number to be chosen by the Government. Then came the "Impressionists," with Manet at their head, and like their predecessors they were stopped outside the gate. After a long struggle the independents triumphed, and for the past twenty years the exhibitors themselves have chosen by ballot the members of the jury.

Protection of the National Gallery.

THE Select Committee to whom the National Gallery Purchase of Land Bill was referred have agreed to a special report, in which they state they are strongly impressed with the importance of the acquisition by the Government as soon as possible of other lands adjoining those obtained under the Bill, in order that the National Gallery may be more effectively protected. It appears that the only additional land that can be of any use consists of the sites of the half-dozen business premises in Pall Mall East between the western end of the Gallery and Whitcomb Street. It was in one of these premises that a fire broke out last year, and but for its being promptly extinguished it is certain the National Gallery, which is in anuglar contact with the building, would have suffered. The land already scheduled for the Gallery is the courtyard of St. George's Barracks and the site of the buildings themselves. These lie on the immediate west of the Portrait Gallery, and have frontages to the north on Orange Street and to the west on St. Martin's Street. Portions of the barracks that abut on this last-named thoroughfare have already been demolished, but the hopes originally held out by the Treasury that the whole site would be cleared before the close of the present year are not likely to be realised. With the barracks removed the Gallery will stand isolated without any danger from fire save for the menacing business premises in Pall Mall East.



GATE IN THE CATHEDRAL CLOSE, SALISBURY.
DRAWN BY H. T. REES.

Praise, for a Change.

SPEAKING of the students' work in the national competition at South Kensington, of which a criticism appeared in our issue for August 7th, an art critic in the London "Echo" says: "As a nation of shopkeepers we can rejoice that there is a distinct advance in the quality of the purely decorative work, and especially in the matter of mural enrichment, jewellery and metalwork design. Each year discovers an increasing vigour in these branches. Our cretonnes, our carpets, our wallpaper, and our metalwork in the near future stand an excellent chance of becoming things of real beauty. These designs are works of art, and they are within the limit of the cheapest manufacturer, who in turn brings them within the range of all classes. Our wonder on looking at the really delightful effects obtained by stencilling upon canvas is that greater use is not made of this method of wall-covering."

Proposed City Square for Hull.

THE Corporation Property and Finance Committees of the Hull Corporation recently accepted the scheme of Mr. Hirst, the city architect, to form a great City Square in the heart of Hull. The city architect reported that in accordance with instructions he had interviewed the present tenants of the shops in the Corporation property in Waterworks Street, Junction Street, St. John Street and Chariot Street, and had submitted to them plans showing accommodation sufficient for those who expressly desired to take shops after the rebuilding. He proposed to take down the whole of the present old shops and buildings, to provide a large open square near the Monument and to erect thirty-four shops of varying frontages, some with ground floor and basement only and others with four floors. The scheme included also the provision of a public hall with retiring-rooms, together with three large reception halls. These halls would be on the first floor with a main entrance from the proposed square. There would also be eight subsidiary entrances and exits in Waterworks Street and St. John Street. The great hall would have side and rear galleries and an orchestra, and would accommodate 3,000 persons. The three smaller halls might be used either with or without the great hall. The buildings could be carried out in two portions, commencing at the proposed square, provision being made during reconstruction for the older tenants, and when the buildings were finally completed the option of position could be given to such older tenants. The proposed square measures 272ft. from north to south and 216ft. from east to west (from building to building). The area proposed to be added to the existing streets is about 1,600 sq. yds., thus forming an open square in the heart of the city a little over an acre in extent. The approximate estimate for erecting the buildings, including the purchase of necessary land to complete the block, is £92,000. The estimated rentals from the new shops (including two licensed houses to be rebuilt, one of which could be used in connection with the public hall) was £6,836; from public hall, £1,014; increase of rates on shops, £632, making a total nett revenue of £8,247. The present nett rental of the property is £4,375, leaving a balance of £3,872. The Corporation do not get possession of the property until February of next year. As soon as the existing tenancies fall in building operations will be commenced.

Restoration at St. David's.

THE restoration of the lady chapel of St. David's Cathedral, which has just been completed, includes a groined ceiling of Doulton stone. The style adopted is the same as in the original—moulded ribs, started off the original old springers, there being the usual number of bosses and shields, on which are carved the arms of the bishops and deans. The outside roofing is of cast lead surrounded by a stone parapet. At the east end is a niche in which has been placed a statue of the Virgin and Child. This is also of Doulton stone. The pinnacle on each corner has also been restored. The flooring is of fine Portland stone and encaustic glazed tiles in squares. The ancient monument on the south wall of Bishop Martin has also been restored. The ante-chapel situated between the Bishop Vaughan chapel and the lady chapel, though seemingly detached from the cathedral, yet is not so. The ceiling and flooring have been renovated and restored where necessary. This present restoration has been carried out by Mr. William Thomas, Haverfordwest, contractor, under the superintendence of Mr. James Thomas, of the same place, the architect being Mr. Scott, son of the late Sir Gilbert Scott.

RANGE BOILERS.*

BY THOMAS POTTERTON.

BOILER power is a very important item and should always, with as small a consumption of fuel as possible, be well able to give the hot water required in a reasonable time, say thirty minutes after lighting the fire.

Fig. 1 is a section of a range with the ordinary arch flue bath boiler; Fig. 2 is the boiler out of the range. This allows an enormous waste of heat, exposes very little surface to the action of the fire, and for the amount of fuel consumed gives the least effective results of any water-back range boiler. If fitted to a range with a fire 12in. wide, 12in. high and 9in. deep, the boiler should be 16in. wide, 10in. high, 9in. back to front, the arch flues being generally 5in. or 6in. wide by 4in. high. This boiler would have about 1¾ft. of heating surface. My experience is that a hot-water cylinder of 25 to 30 gals. is quite large enough for this class of boiler, with one bath and two other draw-offs.

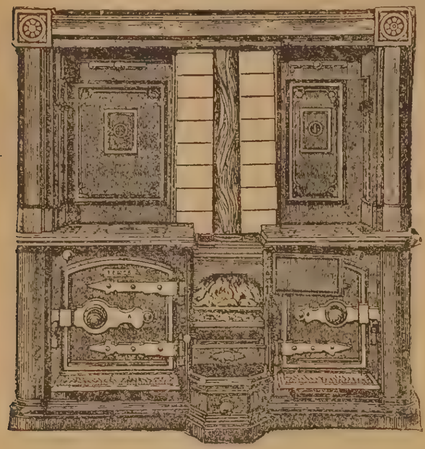


FIG. 1.

Fig. 3 is the ordinary boot boiler, of which a large number are used. It is a small improvement upon the boiler shown by Fig. 2, and when fitted to a range fire of the same size as the one last mentioned it will, if properly set, expose about 4ft. of surface to the action of the fire. I consider a reservoir of 45 gals. is suitable for a boiler of this type and size, which would supply one bath and three draw-offs.

Fig. 4 is an improvement upon Fig. 3, having a tubular flue. It has about 6ft. of heating surface, and under the conditions before mentioned would supply a reservoir of 60 gals., with two baths and four draw-offs.

Fig. 5 is a range boiler (in two sections) specially constructed to avoid the usual waste of heat which escapes into the chimney, as occurs with the boilers in Figs. 2, 3 and 4.

Fig. 6 shows this boiler fitted to a range, the soot doors being lifted off to expose the flue, which it will be seen is very easy to clean, much more so than the ordinary back boiler flue. This is a most powerful range boiler and, as will be seen, the flames pass between the waterways, a large area of which is horizontal heating surface, the most effective that can be had.

The boiler has about 17ft. of heating surface with the leg 15in. deep, and a reservoir of 120 gals. would not be too large if fixed under similar conditions to the others. I have fixed them with 180-gal. cylinders with satisfactory results. It will be noticed that I have given the boilers similar conditions as to fireboxes, &c.

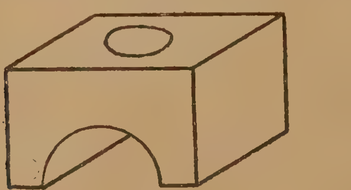


FIG. 2.

From what has been said it will be seen that the smallest boiler has about 2ft. of heating surface or less and the largest about 17ft. From the smallest boiler you would get about 25 gals. of boiling water two hours after lighting the fire; but from two tests, one tried by myself in London and another carried out by an engineer in Manchester, 120 gals. of water were heated to boiling-point by a zig-zag boiler two hours after lighting the fire: so that I have no hesitation in saying that, by consuming the same amount of fuel, boiler Fig. 5 will give five times the result of boiler Fig. 2, and is sufficient to supply four baths and eight to ten draw-offs.

In many instances boiler Fig. 5 will, if required, make a large quantity of hot water in excess of the domestic wants, and its surplus can be used to heat or supplement the warmth of halls, staircases, billiard or other rooms.

Fig. 7 shows an apparatus installed in a house near the Crystal Palace. In this case the existing domestic supply was not altered except for two things. Firstly, a combination towel drier of 20ft. heating surface was fixed in the bathroom to the return from the hot-water tank (which was also fixed in the bathroom); and secondly, the cold-water down-pipe was disconnected from the bottom of the hot-water tank and carried down to join the return pipe near the boiler. As well as in the bathroom, warmth was required on the first-floor landing B, hall ground-floor C, bedroom first-floor D, drawing-room E, and in the billiard-room F. Four radiators of 30ft. heating surface and one of 60ft. were installed. The old range and boiler were taken out, and part of the old apparatus, flow and return pipes to point A, were cleared away. A new range and boiler (Fig. 5) were then fixed, the new part of the apparatus being piped as follows: A 2in. pipe is carried from the top of boiler along near the ceiling to the point A (which is the highest point in this main) where the flow and return pipe to the existing apparatus (tank in bathroom and new towel drier) are connected off and on as shown. From the point A the 2in. main is run with fall out and back to the boiler, making a circuit as near as possible under the different radiators. From this main 1in. connections are made on the one-pipe system to the radiators of 30ft. heating surface, a 1¼in. pipe being carried to the radiator F in the billiard-room, the return from which joins the 2in. return pipe near the boiler. The apparatus is arranged so that the 2in. pipe is always in circulation, and should air accumulate in the radiators the main will properly fill, always circulate, and supply hot water for domestic use. All air collecting in the 2in. main will pass out at the expansion pipe. Each radiator is fitted with a stop valve, and the whole of the heating apparatus can be shut off. The pipes in the basement are covered with sectional pipe-covering consisting of hair-felt ½in. thick and strawboard exterior. This pipe-covering, bulk for bulk, is the best heat non-conductor I have tried. I have it fixed side by side with the best asbestos obtainable. It is easily fixed and makes a neat finish. The radiating surface of the heating apparatus amounts to 200ft. in all. This apparatus was fixed several years ago and has proved quite satisfactory.

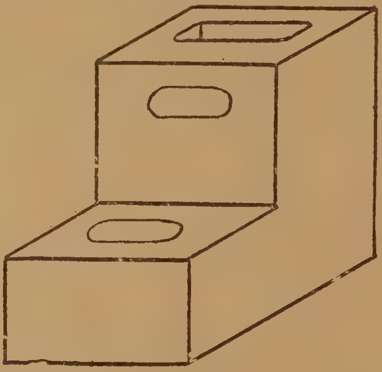


FIG. 4.

With reference to incrustation in installations of this kind, I might mention that during the past seven years I have fixed many of these boilers in different parts of England and Wales, and in no case have I heard of incrustation interfering with the working of them.

Last autumn my men took out a boiler of Fig. 5 type which had been in use six years in London in order to fix a more powerful one in its place for a larger installation. There was only a very small amount of lime in the boiler taken out, and none in the 2in. main.

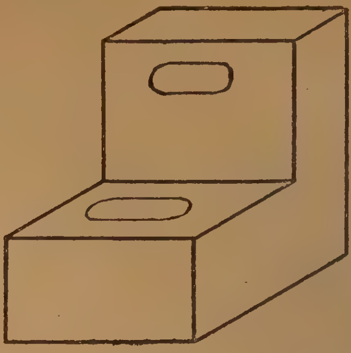


FIG. 3.

Fig. 8 is a diagram of a heating apparatus fixed in a new house in Devonshire, to work in conjunction with new domestic hot-water supply. The house will be seen to consist of ground and first floors only. The hot-water service supplies two baths, two lavatory basins and slop sink on first floor, scullery and butler's pantry sinks, and lavatory basin on ground floor. The hall and staircase are warmed by radiators, and the two bathrooms by combination towel driers, while radiators for supplementary heat are provided in the dining-room and in one bedroom. The range and boiler are of the same class as those previously described. A hot-water tank (capacity 80 gals.) is fixed near the scullery ceiling. A 2-in. primary flow is run from the boiler to the tank with a safety-valve fixed on it near the boiler. From the top of the tank an expansion pipe is carried, discharging above the roof. From the expansion pipe, directly above the tank, two branches (not shown on diagram) are carried, passing in different directions for hot-water services. These are run partly in between ceilings and floors, and circulate as near the draw-offs as practicable, returning to the hot-water tank, which it joins on the side near the top. (None of this is shown on the diagram.) All draw-offs have control or stop valves fixed as near as possible to them, so that new washers may be fixed to the taps without emptying the apparatus.

The heating mains are as follows: From one side near the bottom edge of the tank a 2in. main is carried passing up towards the ceiling, and branching right and left with one 1¼in. pipe and one 2in. pipe, as shown. This construction reserves the hottest water in the apparatus for domestic purposes, and there is always about 80 gals. of it available in the tank and circulation above it. These two mains make a circuit of the building to the different radiators, and return to the boiler under the ground floor. They act as the return from tank to boiler, always being in circulation. Part of the ground

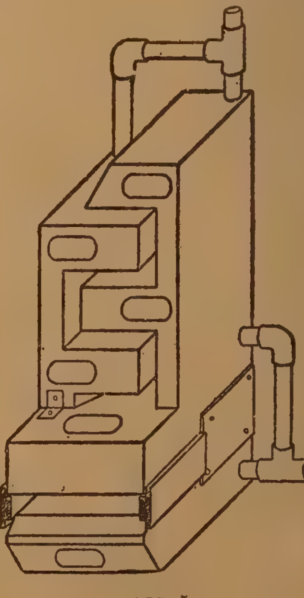


FIG. 5.

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* A paper read before the Institution of Heating and Ventilating Engineers.

floor is of wood-block flooring, in which a channel is formed next the skirting for the pipes to pass in. The space is filled with slag-wool, and a board is screwed down over the channel so that the pipes are always accessible. The 2in. pipe to the right is carried along near the ceiling of the scullery and servants' hall, and is reduced to 1½in. after passing E. It passes down the wall in the angle and then under the floor to F, where it is increased to 2in., returning to the boiler through the channel referred to. It rises from the tank to J, which is the highest point in this circulating main and where a ¾in. air pipe is carried up above the roof, ensuring the apparatus working for domestic supply without any air valves. From J there is a fall to K. The 1¼in. pipe to the left is carried across the kitchen and housemaid's pantry, passing down the angle and returning to the boiler through the channel. This circulation rises from the tank to H and falls from that point to K.

Now as to the radiation. Radiator A is supplied for supplementary heat in the best bedroom (of 4,000 cub. ft. space). It stands near the door and has 42ft. of heating surface. It is connected to the 1½in. main with 1¼in. pipe at the top and bottom one end. Radiator B is provided for supplementary heating in dining-room (of 4,000 cub. ft. space), and is similar to A in heating surface and connections. Radiators C and D are provided on ground floor for the hall and staircase. C has 35ft. of heating surface and stands near a garden entrance; it has 1¼in. connections, as shown. D contains 45ft. of heating surface and stands at the foot of the staircase; it has 1¼in. connections also. Towel driers G and H, each with 20ft. of heating surface, are provided in the bathrooms (of 1,000 cub. ft. space each). There is 200ft. of heating surface in the apparatus without the hot-water tank and domestic supply. The circulating mains are covered with sectional hair-felt covering. The hot-water tank is cased in wood and packed with slag-wool. The return to the boiler being used also for domestic supply, I have fitted the three radiators A, B and D with two union valves each. If this were not done the hot water would work up the return pipes in summer time. It was not necessary in the case of the radiator C, as the valve fixed at the bottom of the radiator entirely stops the circulation in this branch.

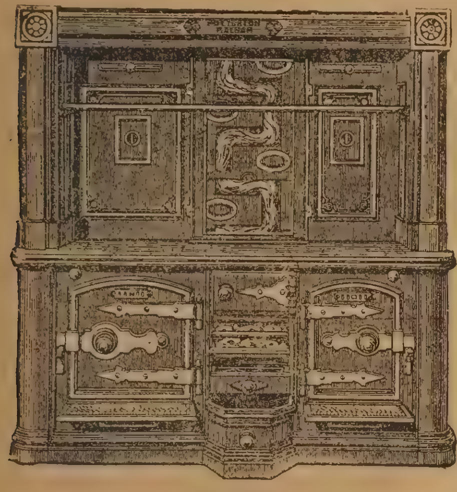


FIG. 6.

Fig. 9 is an apparatus fixed in a house at Wimbledon, and is much larger than the two previous ones. More hot water is required for domestic use and a larger heating apparatus is needed. The hot-water service supplies the scullery, vegetable cleaning and butler's pantry sinks in basement; lavatory basin on ground floor; two douche and spray baths, four lavatory basins, and housemaid's and slop sinks on first floor; one ordinary bath, one sink and one lavatory basin on the upper floor (15 points in all). Heat is required in the billiard-room, hall and three bathrooms, one having a linen closet. This apparatus is worked from two ranges fitted with ziz-zag boilers. One, in the kitchen, is a 60in. range with 12in. by 12in. by 12in. firebox, and the other, in the scullery, a 54in. range having a 12in. by 12in. by 9in. firebox. The cylinder-tank system is adopted. A 100-gallon cylinder is fixed in the scullery with flanges riveted on to receive the various connections. For the primary circulations 2in. flow and return pipes are run between the two boilers and the cylinder, the flows being connected near the top and the returns to the bottom of the cylinder. Between each boiler and the cylinder in both flow and return pipes fullway stop-valves are fixed. A safety valve (having a draw-off cock at the top) is fixed in each flow pipe and a draw-off cock in each return, both on the boiler side of the stop valves. This arrangement is to enable one boiler to be cleaned out while the other is in use. When emptying a boiler for cleaning purposes, its two stop valves are closed, and the draw-off tap on the top of the safety valve is opened. This enables the water to be drawn freely from the emptying cock. A 40-gallon tank is fixed in the cistern-room. For the secondary circulation 1½in. flow and return pipes are run between the cylinder and this tank. The flow is connected to the side of the tank near the bottom edge.

It will be noticed that the tank is fixed above the highest bath. The object of doing this was to obtain a full flow of water at the high taps, even though other taps below might be opened at the same time. This can only be effected by having a store of hot water above the highest taps. A 1¼in. expansion pipe is carried up from the tank. Branch circulations are carried from the secondary circulations, passing as near as possible to the different draw-offs, those to the douche and spray baths being 1¼in. Stop valves are fixed to all taps.

As regards the heating apparatus, four radiators, A, B, C, D, of 50ft. heating surface each, are fixed in the billiard-room. One radiator, E, of 50ft. heating surface, is fixed in the hall. Two combination towel driers, G and F, of 20ft. heating surface each, are fixed in the two bathrooms on the first floor. One combination towel drier, H, of 30ft. heating surface, is fixed in the top bathroom. Along the bottom of the linen closet in this room 75ft. run of 1in. pipe are carried. The total heating is thus:

Billiard-room	200 ft.
Hall	50 ft.
Two bathrooms on first floor.	40 ft.
Top bathroom	60 ft.
Total	350 ft. of heating surface.

The mains are as follows:—To heat the radiators in the billiard-room, A, B, C, D, a 2in. pipe is taken off the side of the cylinder about two-thirds down. This is carried beneath the billiard-room (along the basement ceiling), passing under the positions of the radiators. It then returns to the cylinder, joining it on the side, as shown. This main rises to the first connection of the radiator A, which is the highest point in this circulation. It then falls all the way to the cylinder. Two fullway stop valves and draw-off taps are fixed in this section for emptying if necessary. The radiators are connected on the one-pipe system. To heat the radiator E, in the hall, a 1¼in. pipe is run from the tank, passing into the top and out of the bottom of the radiator, returning under the

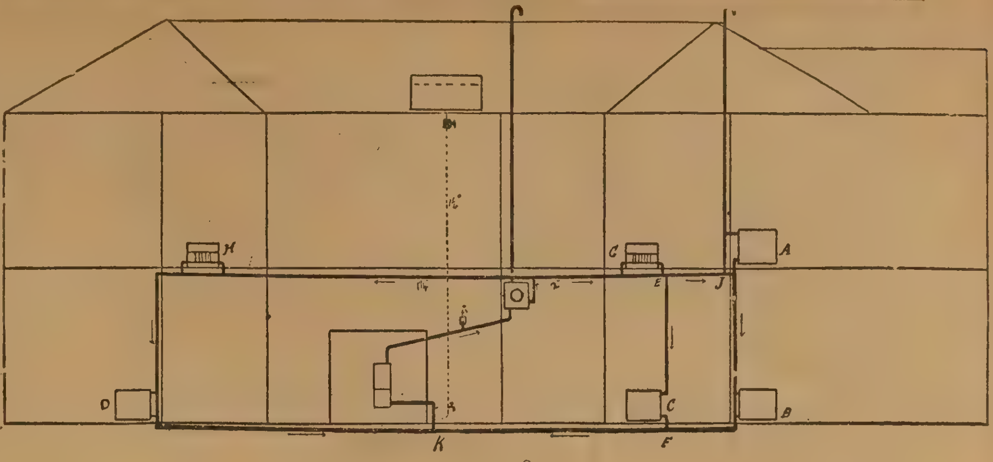


FIG. 8.

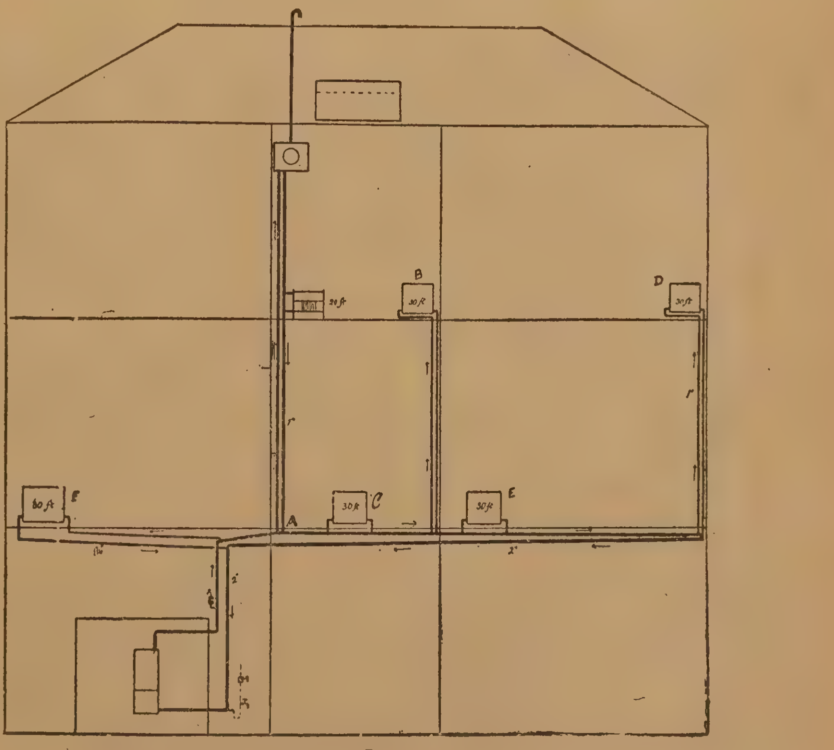


FIG. 7.

basement floor to the kitchen boiler. A stop valve is fixed in this return to shut off this branch when cleaning out the boiler. In this instance I have had to do what I would rather have avoided, that is, to connect the 1¼in. pipe which supplies the radiator E with the hot-water tank in the cistern-room. This, however, was the only course available. If the conditions had been favourable, I should have connected it with the cylinder in the basement, a little higher than the connections of the heating main to the billiard-room. I find that although the circulation of this branch is below the boiler and other parts of the apparatus, the results are most satisfactory, and the radiator in the hall heats well.

With respect to the hot-water supply to the towel driers, in this case I have also departed from my usual practice, having connected the combination towel driers to the circulations from which the hot-water supplies to the baths are drawn. It was permissible in this instance, as the circulations to the baths are in 1¼in. pipe. The towel driers have ¾in. connections, and the water after passing into the return pipe from them is hot enough for use. All radiators and towel driers are fitted with union angle valves.

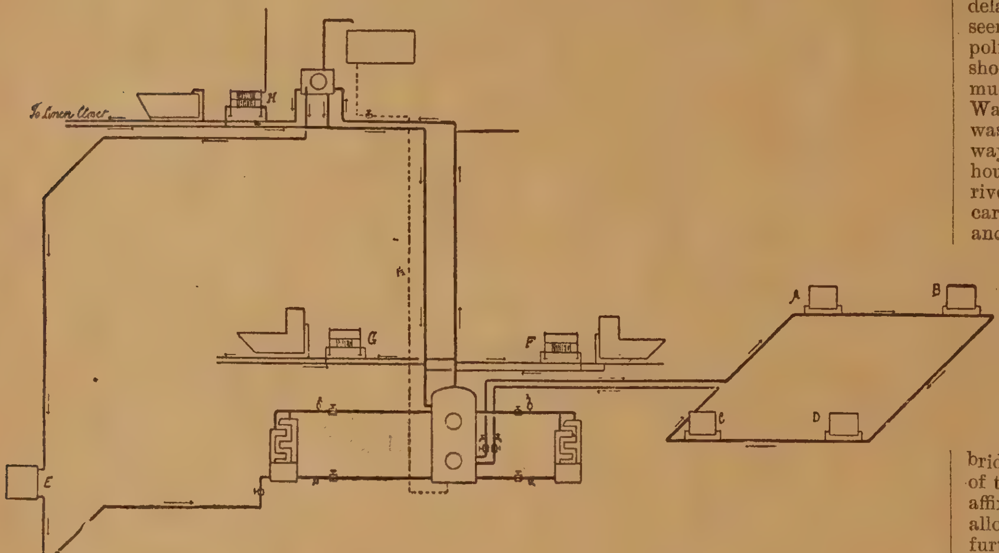


FIG. 9.

To prevent loss of heat and the overheating of scullery, the hot-water cylinder is covered in the following manner: Two layers of ½in. hair-felt are glued on the cylinder, and then bound round with wire. Over this is fixed a layer of silicate cotton sewn on strong canvas. The whole is covered with two layers of wire-netting, ½in. mesh, and then plastered all round and on top with a coating of plaster and Keene's cement, the whole being coloured to match the scullery walls. This was an expensive method, but most effective. The intensely hot water in the cylinder causes no inconvenience—in fact there is very little difference in the temperature of the outside of the cylinder and the walls of the room. The hot-water tank in the cistern-room in the roof is not protected. The warmth given off will prevent the cold service pipes freezing. Nearly the whole of the pipes to both the hot-water service and the heating apparatus are covered with sectional pipe-covering. One fire only is used in summer time, the damper to it being regulated to give little or much hot water as required.

In conclusion, it must be remembered that every apparatus varies to meet different requirements, and although the schemes described give every satisfaction the design of an apparatus must wholly depend upon particular circumstances.

On this account the designs given cannot in any way be considered as examples to be worked to; and while no doubt whatever need be entertained about the ability of the boiler to do the work stated, it is by practical judgment alone that success is obtained.

LIVERPOOL'S NEW TECHNICAL SCHOOL.

LIVERPOOL'S new technical school, designed by Mr. Edward W. Mountford, F.R.I.B.A., is now approaching completion. The building is an imposing addition to the pile which occupies one side of William Brown Street, and harmonises with the world-famous St. George's Hall. In the lofty vestibule columns of brilliant Devonshire marble rise from the tessellated floor, and around the circular dome are placed finely-executed panels by Mr. Pomeroy illustrating the rise of ship-building. Other symbolical sculpture tinted in various colours adorn the superstructure, and a spacious fireplace of marble, topped with a plastic representation of the city crest, adds to the attractive appearance of this vestibule. Of the five floors three are devoted to technical instruction under the directorship of Mr. Hewitt. The two floors above form the museum galleries. At the top of the building is a cross gallery devoted to chemistry, where fifty or sixty students may work, while above all is an observatory containing a large equatorial telescope. In the basement, which is really on the street level, are a large number of rooms and laboratories devoted to various branches of handicrafts. The engineering laboratory also finds a place in the basement, with testing machines and other fixtures, while woodwork, carpentering, joinery, &c., is also provided for.

The chief feature of the ground floor is the large lecture and examination hall. This is a lofty chamber with an oak floor and walls lined with white wood, and will afford accommodation for about 400 or 500 persons. One end of the hall is occupied by a platform, above which will be inserted a decorative panel by Mr. Pomeroy, whose sculptural work figures largely throughout the building. This floor contains a large number of classrooms, a physics lecture-room, and rooms especially well lighted for machine drawing. Building construction occupies also a portion of the first floor, upon which are a number of additional classrooms. Several special rooms in this part of the building are set apart for the work of the nautical college. Ventilation is by the "Plenum" system. At the rear of the building is a large courtyard containing boilers and other apparatus, by which filtered and warmed air is driven along a sub-basement and thence up the flues into the various chambers of the building. This system of ventilation, which is expected to prove entirely satisfactory, formed the chief object of inspection on the recent visit of a deputation from the Corporation of the City of London. The deputation were making enquiries into the matter for the purposes of the new Sessions House.

VAUXHALL BRIDGE.

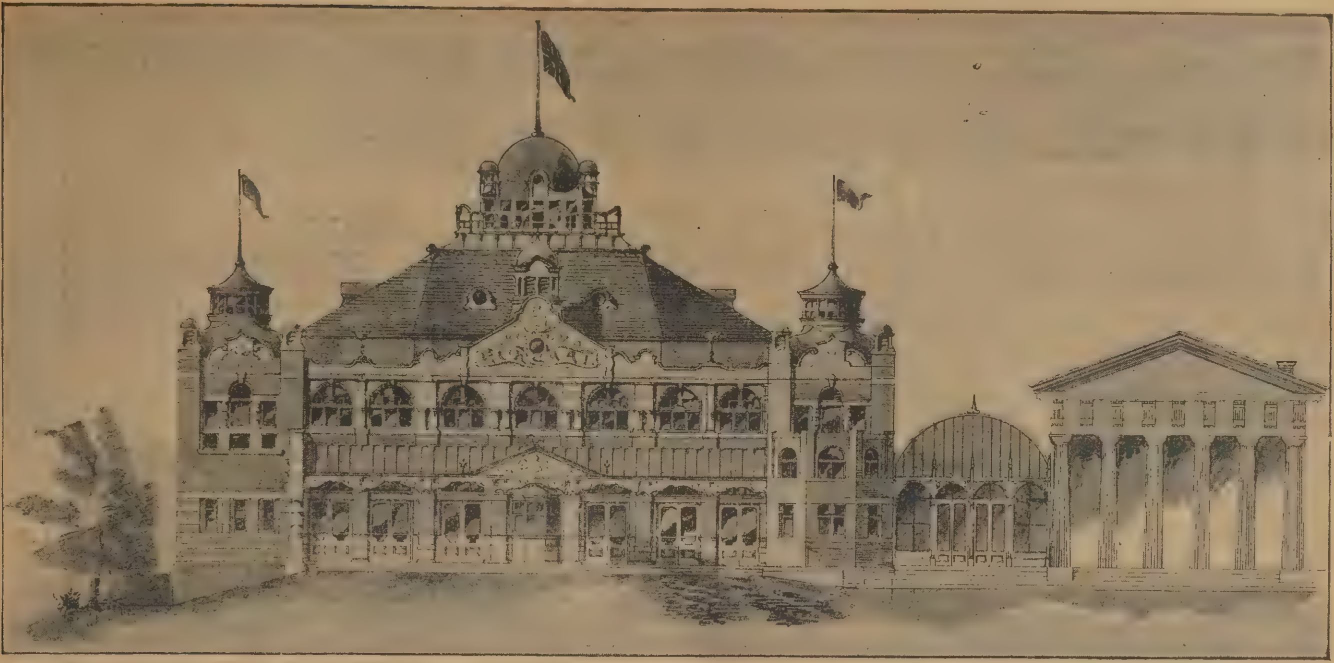
The Delay.

WHEN the new bridge over the Thames at Vauxhall is finished it will have cost probably £400,000, and have occupied an unconscionably long time in building. The bridge is one of the London County Council's undertakings, but the work is being done by contractors. The necessity for a new bridge at this point of the river became apparent shortly after 1879, in which year the bridge that had been begun in 1811 and finished in 1816 was opened free to the public by the Prince of Wales. These two dates are interesting, because they mark by contrast the extraordinary delay that has taken place over the erection of the new structure. In five years the old bridge was begun and finished. Three years have now elapsed since operations upon the substructure only of the new bridge were commenced, and an impartial examination of its present condition, taking into account also the rate of progress that has been made, indicates the lapse of another two years before the preliminary portion of the work is out of the contractors' hands. The history of the bridge at Vauxhall is interesting, but it cannot be said to throw any light on the present delay. As already stated, an investigation which seems to have taken place in 1879, when the Metropolitan Board of Works took over the bridge, showed that the foundations of the piers were in much the same dangerous condition as those of Waterloo Bridge at about the same time. This was due to the deepening of the bed of the waterway, the result of the great velocity—7½ miles an hour on the surface—which the ebb tide has in the river. Navigation was endangered, barges being carried against the piers, to their mutual injury, and lives were occasionally lost. In consequence of this state of affairs, Parliamentary powers were obtained in 1881 for increasing the width of the waterway beneath the bridge by the removal of two of the central piers and the underpinning and carrying down of the piers on either side to a greater depth.

But no sooner were these Parliamentary powers obtained than the question arose whether the complete reconstruction of the bridge would not be a more satisfactory method of treatment. The question was answered in the affirmative, and the Parliamentary powers were allowed to lapse. In 1887, however, there was further trouble with the bridge, and it was found necessary to protect the foundations of three or four of the deep-water piers. Subsequently the County Council decided to adopt the drastic course of entirely rebuilding the bridge, and in 1895 the Vauxhall Bridge Act, which authorised the rebuilding and the construction of a temporary bridge to accommodate the traffic during the removal, was obtained. This temporary structure which is now in use was opened in August, 1898, having cost £40,000.

The contract for the substructure of the new bridge was accepted in July, 1898, and the work was started shortly afterwards. The contractors were Messrs. Pethick Bros. of Plymouth, and their tender of £165,000 was accepted for the usual reason, that it was the lowest. The time allowed them expired, we understand, last March, but the work is still going on, and another two years would seem to be necessary for its completion. During these two years, and during the years that must elapse before the bridge is finished and opened, all the traffic, and it is very considerable, that crosses the Thames at Vauxhall is greatly inconvenienced, much of it having to make a detour of between 800 and 900 yards.

The Tunnel under the Quirinal Hill, Rome.—A tunnel has been bored under the Quirinal Hill connecting by a level passage for tramcars older and newer Rome. The summit of the hill in covered by the King's palace and gardens, and the excavations below have seriously damaged the royal grounds. The soil is subsiding to as alarming degree, snapping water pipes and uprooting trees. It has been found that a great part of the hill was honeycombed by the constructions of the ancient Romans—a fact which the modern engineers of the tunnel had evidently overlooked.



THE NEW KURSAAL FOR HARROGATE. ROBERT J. BEALE, A R.I.B.A., ARCHITECT.

A.A. STUDENTS' DESIGNS.

LAST week the Architectural Association medal drawings and the designs made in the School of Design were exhibited at 56, Great Marlborough Street, W. The subject set for the A.A. medal was "A Private School for Fifty Boys," for which eight sets of designs were submitted. On the whole these were of very fair merit, but exhibited various and vast differences in the matter of arrangement and accommodation; for instance, "Pat McKann" provides only two classrooms 16ft. sq. and a dining-room 14ft. by 20ft.—for fifty boys—while "Festina Lente" makes his classrooms a little larger and his dining-hall 53ft. by 25ft. "No. 36" sent no ground-floor plan. Some of the designs showed buildings of considerable size, while others were alarmingly small; but, taken as a whole, they showed promise, the planning being generally fairly simple. As regards the exterior, the design by "Pat McKann"—who has been awarded the medal—is certainly the best, but the wings on each side of the entrance do not balance well, those on one side especially being muddled. "Pat McKann," by the way, is evidently a humourist, for over his dining-room mantelpiece appears the following motto: "What we want is more meat." "Ut Umbra sic Vita" makes his dining-hall a central feature, being approached by a flight of steps; and the effect is good. "Wackford Squeers" had a curious parapet, and the design as a whole gave one the impression of a mixture of some new municipal offices enhanced by features of Haddon Hall. "Chuzzlewit Junior" exhibited a good design, "Truant" had a badly-coloured set of drawings, and "Section IV." was equally crude in pencil with a sepia perspective.

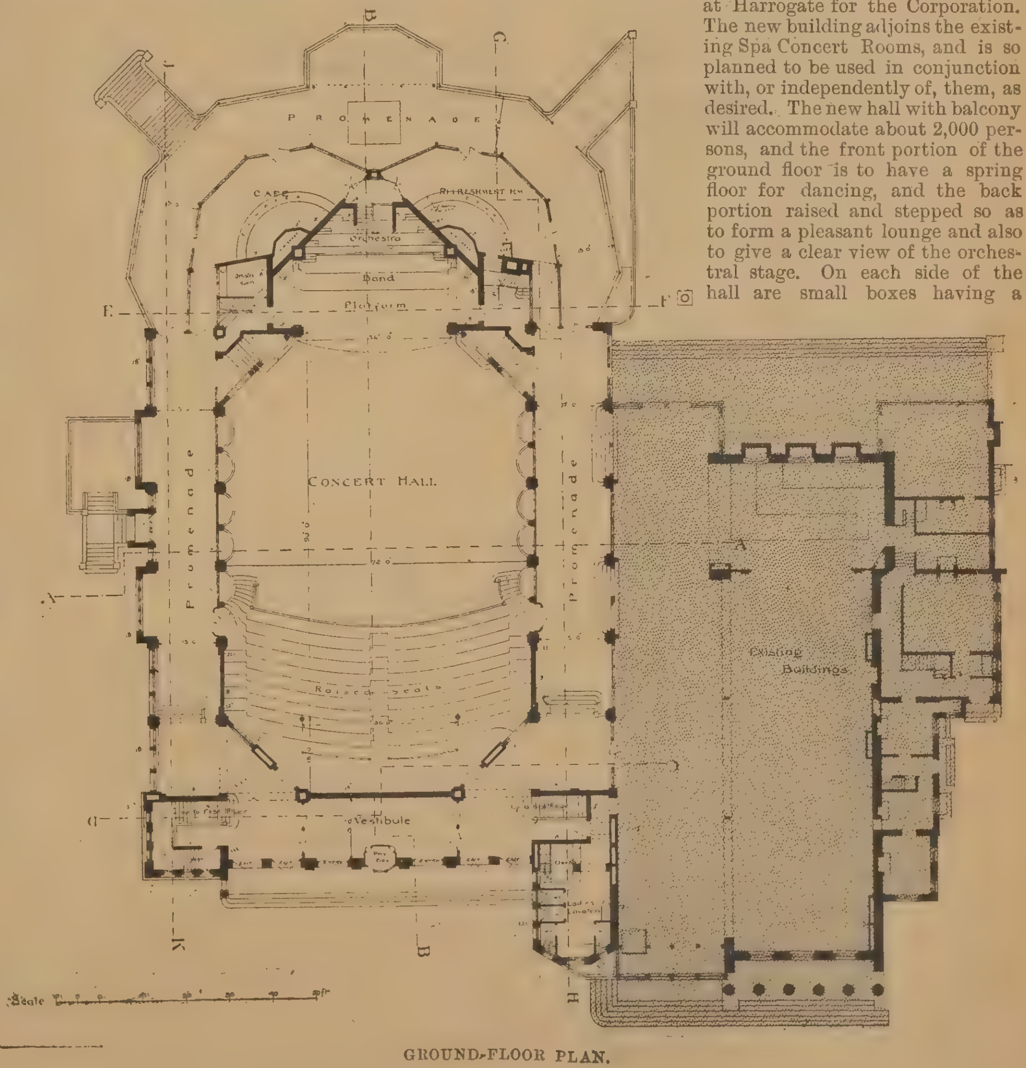
The A.A. Union prize has not been awarded, only one set of drawings (of Gwydyr House) being sent in this year, and these were not considered of sufficient merit.

The Banister Fletcher Bursary was won by Mr. T. Frank Green, who showed good pen and ink work and pencil work of Morden College, Blackheath, and St. Margaret's Church, Ipswich; Mr. Alfred C. Bosson exhibited very excellent measured drawings of the church of St. Mary Woolnoth and Inigo Jones' banqueting hall in Whitehall; Mr. A. R. Conder's drawings of various churches were far inferior to them.

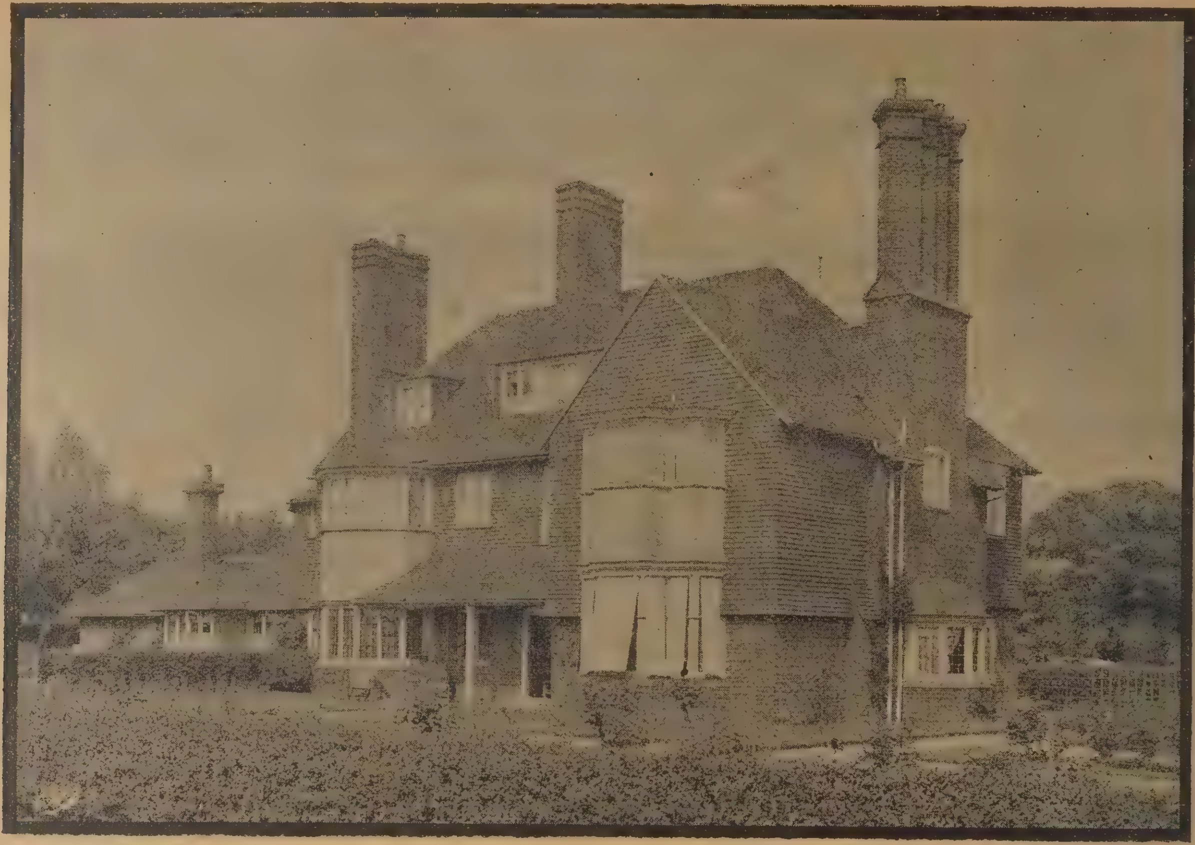
In the School of Design the subjects of "A Village Church," "A Terrace to a Country House," "Almshouses for Twelve Inmates at Maidstone," "A Staircase," "A Lych Gate," "A Grill" and "A Dairy in a Private Park" drew forth some strange and wonderful things, the prevailing tendency being towards novelty. Some of the designs for the dairy were very praiseworthy, those of Mr. E. H. Bullock and Mr. Ernest G. Theakston deserving special mention.

HARROGATE'S NEW KURSAAL.

ILLUSTRATIONS are given on this page of the new kursaal now in course of erection at Harrogate for the Corporation. The new building adjoins the existing Spa Concert Rooms, and is so planned to be used in conjunction with, or independently of, them, as desired. The new hall with balcony will accommodate about 2,000 persons, and the front portion of the ground floor is to have a spring floor for dancing, and the back portion raised and stepped so as to form a pleasant lounge and also to give a clear view of the orchestral stage. On each side of the hall are small boxes having a



GROUND-FLOOR PLAN.

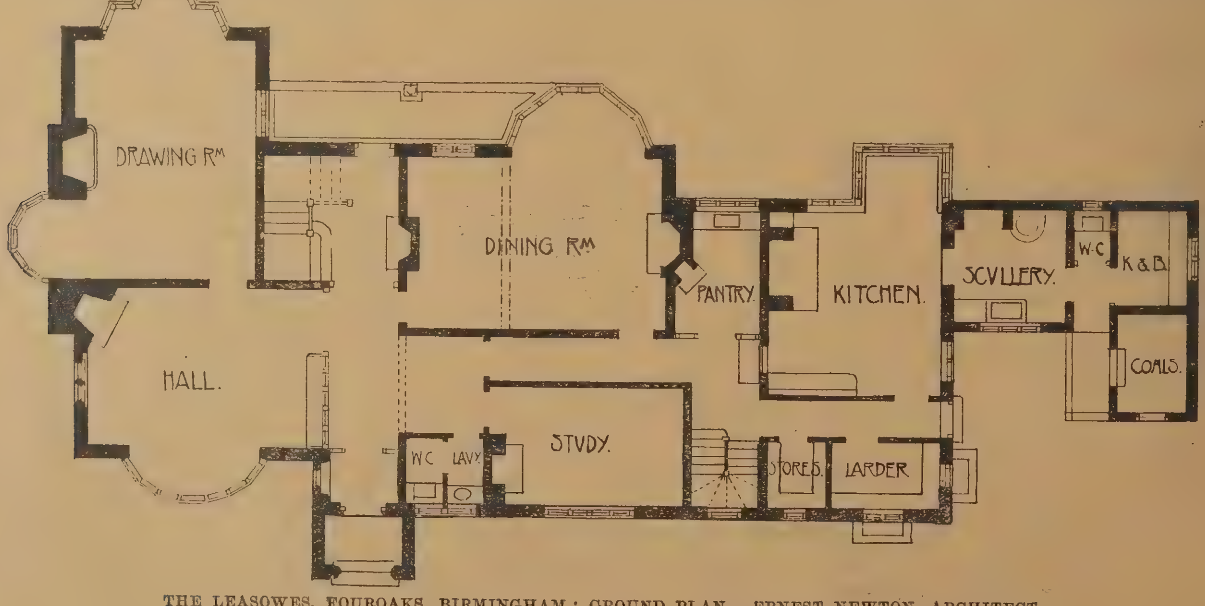


THE LEASOWES, FOUROAKS, BIRMINGHAM : GARDEN FRONT. ERNEST NEWTON, ARCHITECT.

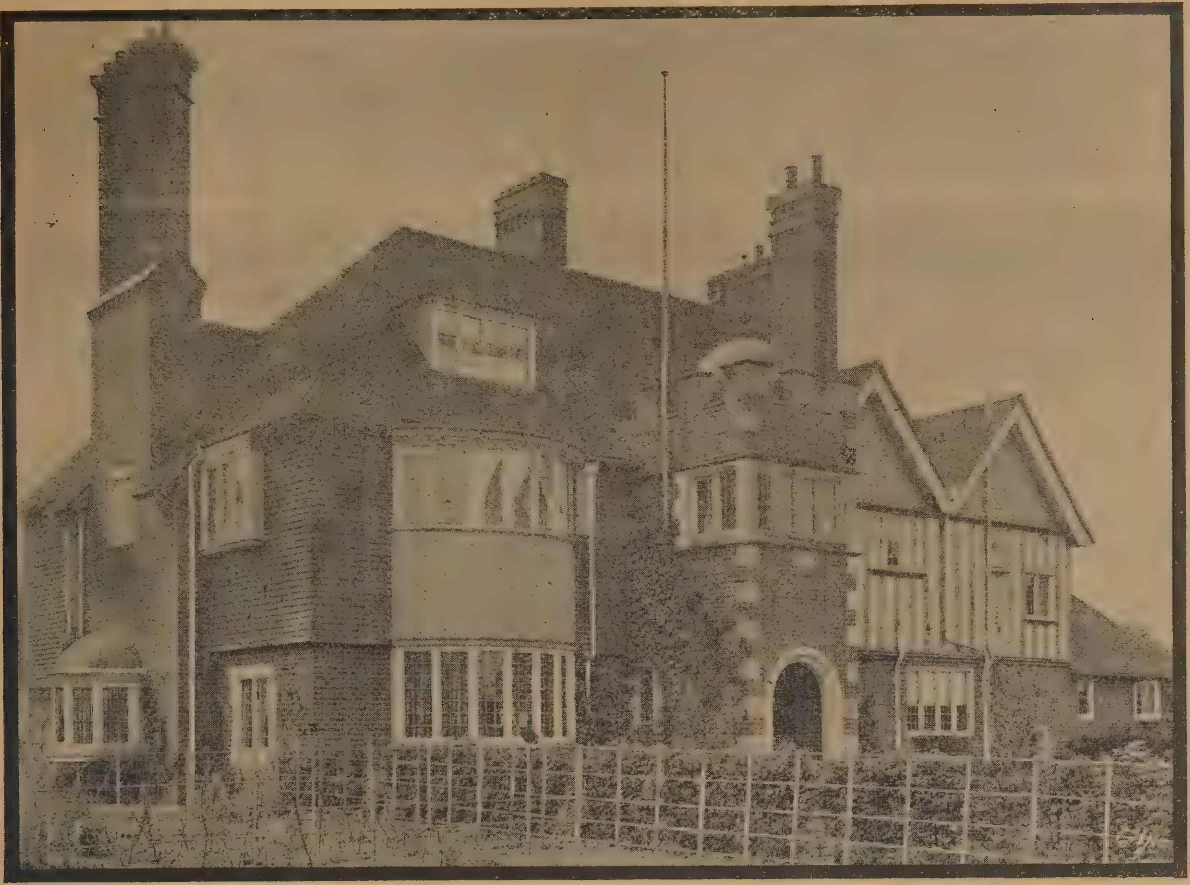
sliding screen between them and the promenades, the floors being on the same level. On the first floor a wide balcony and lounge are at the back and narrow wings at each side, all well stepped so as to give a clear view. Careful attention has been given to the provision of entrances and exits, which are ample for rapidly clearing the building. A spacious promenade extends around the whole building with alcoves, refreshment-room and café in connection therewith. In the basement are the lavatories and cloakrooms, male and female chorus rooms, bandroom, kitchen, &c.; and in a pleasant position under the promenade at the back is a billiard-room suitable for two tables and having an entrance by a staircase from the promenade over and also from the grounds direct. Externally the building will be faced with coursed Pateley Bridge rock-faced wall stones, with dressings and moulded work of Killinghall stone. The roof will be covered with Westmorland green slates. The architect is Mr. Robert J. Beale, A.R.I.B.A., of Broadway House, Westminster, whose design was selected in competition by the assessor, Mr. Frank Matcham (who also suggested various modifications which have been adopted). Mr. Beale will be responsible for the decoration and furnishing of the interior. The total cost is expected to be about £40,000.

THE LEASOWES, FOUROAKS.

THIS house, built for Mr. Sadley from the designs of Mr. Ernest Newton, is one of the many new houses which have been erected on a large building estate at Fouroaks, near Birmingham, which has been developed during the last four years. It is needless to say that many of the new residences are by no means successful from an artistic or architectural point of view. In the majority of cases this result is due to the use of unsuitable material, such as common, local, misshapen bricks, of an unpleasant pale-pink colour, and machine-made tiles, poor in colour and texture, and so close-fitting as to give the roof the appearance of being cut out of a piece with scissors. Sham half-timbering—*i.e.* deal or oak framing 2in. think, nailed on to the outside of the brick walls, with the panels plastered or cemented—is a common vice; lastly, there is a good deal of straining after effects which do not inevitably arise from the interior arrangements. Unfortunately, too, some of the better houses are by no means successful in their planning, and even many of the best designs are spoilt by little bays and excrescences which do not materially add to the comfort of the rooms, and which give the elevations an untidy, undignified and fidgety appearance. There is also an unfortunate predilection among the best architects for putting all their bedrooms in the roof, a method that is not only unhealthy and insanitary but gives the maximum of discomfort with the minimum of convenience. There are one or two houses which are exceptions



THE LEASOWES, FOUROAKS, BIRMINGHAM : GROUND PLAN. ERNEST NEWTON, ARCHITECT.



THE LEASOWES, FOUROAKS, BIRMINGHAM: ENTRANCE FRONT. ERNEST NEWTON, ARCHITECT.

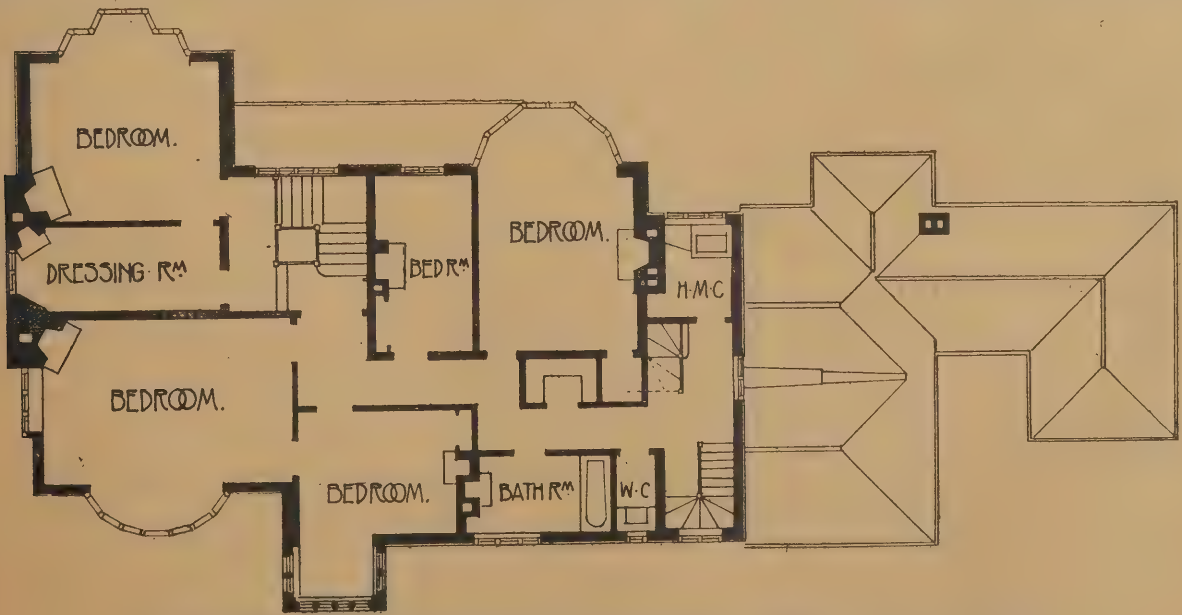
to the general rule, such as "The Leasowes," which we illustrate. Weather tiling has been used on the walls, and this gives the house a somewhat unusual aspect for the Midlands, this type of building being usually associated with the Home Counties. The two half-timbered gables are made of solid oak framing, the pale brown colour contrasting well with the white plaster.

IS A FIREPROOF STRUCTURE POSSIBLE?

THIS is a question which was asked of an architect in connection with buildings of the State institutions of Indiana. "A fireproof structure is possible," was the answer. "Fireproof buildings have been destroyed," was the reply; "and how do you prove your assertion?" The architect said: "Why not consider a cupola furnace? Here is a structure of steel and clay. Where is there a building which may be submitted to such heat, and yet we find the furnace a relatively permanent structure. Of course, this is not an architectural structure, yet it shows possibilities. It indicates that with steel structural supports and a proper use of burnt clay such a structure is indestructible."

Now, it is true that many buildings with a minimum of steel and a minimum of clay protection are quickly and easily destroyed by the burning of a large amount of combustible material in the interior, but who will say that it is not possible to protect a steel structure by the use of burnt clay when he considers the intense heat to which the cupola furnace is subjected? The protection is not relatively heavy, but the work is thoroughly done and well applied. No architectural structure, with the material which it contains in the state of combustion, is ever subjected to the heat which is applied in a cupola furnace. Steel or iron in itself is a material more readily destroyed by fire than wood, yet steel adequately protected presents an absolutely fireproof building.

Many of our buildings are adequately protected in the places where they need it the least; for instance, there is 8in. fireproofing between beams and only 1in. under them. The surface between beams needs the protection the least, and the surface under them or over them needs it the most, and yet it is there where they get it the least. If anyone ever questions the possibility of absolute fire-protection or fireproof qualities of a structure, why not think of the cupola furnace or the coke oven?—From the "Clayworker" (Indianopolis, U.S.A.).



THE LEASOWES, FOUROAKS, BIRMINGHAM: FIRST-FLOOR PLAN. ERNEST NEWTON, ARCHITECT.

CARDINGTON CHURCH.

THE church in the pretty village of Cardington has just been reopened after rebuilding. The new edifice consists of a tower 74ft. in height, nave, the north and south aisles, chancel and north and south transepts. The only part of the old church still remaining are the roof and walls of the chancel, the tombs in the chancel and the east window, while the ancient windows in the chancel have been placed exactly where they were before. The north transept forms a memorial chapel and contains some monuments in high relief on white marble of members of the Whitbread family, while chairs with red kneelers occupy the centre of the chapel. The length of the church is 132ft., the width of the nave is 20ft. 10in., the width of the north aisle is 13ft. 2in. and the width of the south aisle is 11ft. 8in. The lower stage of the tower forms a lobby to the nave, while on the first stage is the ringer's chamber, which also contains the works of the clock. The eight bells have been re-cast by Messrs. Taylor, of Loughborough. Many of them bear quaint inscriptions, which have been fortunately preserved. The Norman arch of the old tower has been removed to its present position at the west end of the nave, and it has been rebuilt stone by stone. The nave has an arcade of four bays, while the arches and caps are moulded after various quaint designs. The columns and the responds are moulded into four circular shafts. The chancel arch is lofty and finely moulded, and the arches from the side aisles to those on either side of the chancel are of a four-centred character. The clearstory has seven two-light windows on the south side and five on the north, where the extra space is occupied by the memorial chapel, which has two windows on either side of the monument and three above. The windows in the aisles have three cinquefoiled lights, with trefoiled lights above; the western windows possess only two lights. The chancer is raised two steps from the body of the church. and the sanctuary is raised two steps higher. The reredos consists of richly decorated panels, There is a coloured east window. Richly ornamented screens of Totternhoe stone divide the chancel from the side aisles, while under them are the altar tombs and brasses of Sir Gerard Harvey and Sir W. Gascoigne. The vestry is at the east end of the north chancel aisle. The organ is placed at the north side of the chancel, and was built by Mr. Trustam, of Bedford. It has a handsome oak case in keeping with the oaken choir stalls, which are decorated with carved "poppy heads." The church is fitted with oaken benches, copied from an ancient pattern in Haddon Hall, Derbyshire. The pulpit, of English oak, is also richly carved, and stands on the south side of the nave. The base consists of pale pink tinted Staffordshire stone. There is a new brass lectern and altar rails. The font is of white Mansfield stone, septagonal in form, symbolical of the "perfect sevenfold gifts and graces of God as the sanctifying Spirit." The central panel is ornamented with a carved representation of the descent of the Dove, and the other six panels have cinquefoiled arches. The font rests on a central shaft surrounded by seven small granite shafts with stone bases and caps. The flooring of the church consists of white Mansfield stone with squares of black marble, while the roofs are of the best English oak. In the wall of the south transept is embedded an Anglo-Saxon coffin slab and a number of early English slabs, which were found in the Norman portion of the tower. The exterior of the church is purely Perpendicular in style. The stone for the walls has been brought from Tansley Moor, Matlock, and is laid in random-coursed work, and all the new dressings are of Ketton stone. The roofs are embattled. Above the western door is an arcade of ten panels, which ornaments the front of the tower, each panel having two cinquefoiled arches. The hood corbels of the arch are richly carved floral designs. Quaint old clock dials (restored by Messrs. Smith & Sons, Derby) are to be found on the north and south sides of the tower, and there is a small one which deserves attention as it is an Anglo-Saxon sundial. The larger sundial was erected in 1782. The outer archway of the south porch is four-centred, with a square head with spandrels bearing floral designs and a richly carved finial rising from the keystone of the arch. Arcades of cinquefoiled ogee arches fill the space on either side of the spandrels and above the arch to the cornice of the embattled gable. The north outer wall of the transept is ornamented with an arcade of ten arched panels, like those on the west of the tower and the south wall of the porch. The heating apparatus is placed in the basement of the tower. The architect was Mr. George Highton, A.R.I.B.A., of London, who was assisted by Mr. G. T. Fields-Clarke, F.S.I., land steward to Mr. Whitbread, at whose expense the work has been carried out.

LIVERPOOL'S NEW HOSPITAL.

THE new David Lewis Northern Hospital at Liverpool is rapidly approaching completion. It is estimated to cost about £120,000. The site on which the hospital stands covers an area of about 12,000 sq. yd.; it has an extensive frontage to Great Howard Street, and it is bounded on the south by Leeds Street and on the north by the Lancashire and Yorkshire Railway. The institution has been erected from plans by Messrs. Pennington & Son, of London, and Mr. C. W. Harvey, of Rodney Street, Liverpool, whose designs were selected out of a large number that were submitted to the committee. Simplicity of arrangement combined with sufficient compactness and concentration to ensure easy and economical administration has been the chief feature aimed at, and the buildings have been so distributed as to obtain the fullest amount of sunshine without crowding them so closely as to impede the free circulation of air.

The hospital affords accommodation for 220 patients—108 surgical cases (72 male, 36 female), 72 medical cases (48 male, 24 female), 20 children, and 20 cases in special wards. The institution consists of three pavilions—one circular and two rectangular—each three storeys in height. The three wards of the south pavilion are occupied by the male surgical beds, on the ground and first floor wards of the circular pavilion are the female surgical beds, and on the top floor are the children's beds; and in the north pavilion are situated the medical beds, the males on the ground and first floors and the females on the second floor. The rectangular wards are 26ft. in width, 94ft. in length and 13ft. in height, while the circular wards are 50ft. in diameter and the same in height as the rectangular ones. The walls of all the wards are finished with Parian cement and varnished, and all angles and junctions of walls with floors and ceilings are rounded. Each rectangular ward has a light iron verandah, overlooking the well laid out ground in front of the hospital. Special attention has been paid to the question of ventilation, what is known as the "natural system" having been adopted for the large wards, the windows being placed opposite to each other, with fanlights hung to fall into hoppers. On each pier a leather radial ventilator is fixed at the ceiling level, and under each bed is a leather louvre ventilator, the vitiated air being extracted by means of flues formed in the chimney shafts passing through the roof. Adjoining each ward are rooms fitted with all the conveniences necessary for proper attendance on the patients.

Each of the large wards is to accommodate twenty-two beds, and each floor of the building is practically a separate hospital in itself. Besides what may be described as the public wards, there are nine private ones for paying patients, and a number of isolated wards for the treatment of specific diseases, including erysipelas wards, tank wards designed for the comparatively new mode of treatment in antiseptic water of typhoid cases, and wards for patients suffering from lupus. While on the question of wards, mention must be made of the manner in which that set apart for the children is designed. Around the entire upper portion of the wall are illustrations and texts of well-known nursery rhymes, the object being to direct the attention of the little patients from their sufferings to the doings of the characters in nursery books known to most children. The paintings have been executed by Mr. Martin, of Hardman Street. Above this ward is a flat concrete roof with a shelter, intended as a playground for the children in fine weather. There is a Swedish gymnasium, which is fitted up with delicately balanced instruments for recovering the use of limbs that have become stiffened through accident, a method somewhat new to this country. The operating theatre is replete with all the latest appliances necessary for the carrying out of operations of every description, and communicating with it are the anæsthetic and recovery rooms. Photographic and analysis rooms are also provided. Turkish, Russian, electric and vapour baths form a feature. The basement floor where these baths are situate also contains a large concert-room, dining-rooms for medical officers, nurses, servants and porters, and various offices essential to the successful conduct of the institution.

The administrative department is centrally situated and within easy access of the other parts of the building. The main entrance to the hospital is from Great Howard Street across a large stretch of ornamental ground which has been laid out by Mr. H. E. Milner, the well-known landscape architect from the Crystal Palace, and up a wide flight of steps. These lead into a vestibule lined with marble, and then into a spacious hall panelled in oak and treated with faïence work in the Renaissance style. Opening out of this hall are the various offices connected with the administration of the hospital. On the east side of a large yard to the rear of the hospital are placed the disinfecting-house, the mortuary, the post mortem-room and the pathological museum. Two other departments that require a passing mention are the laundry and the kitchen. The requirements of each have been met in the fullest manner possible, and both are so situated as to be easily reached from all parts of the hospital.

For all practical purposes the out-patients' department has been arranged to form a separate and distinct building. It is approached by the Leeds Street entrance, and patients after passing the vestibule and registration office enter the large waiting-hall, on three sides of which are grouped the consulting, surgical, medical and ophthalmic rooms. When they have been examined in the consulting-rooms patients can proceed direct to the dispensary and leave the building without again going through the waiting-hall. Adjacent to the out-patients' department is the casualty-room, where all accident cases are taken for the purpose of preliminary examination, and near to this again is a padded room for the reception of violent patients.

The Nurses' Home, where accommodation is provided for sixty-six nurses, is connected on the ground floor only with the hospital, and is entered from the main corridor near to the Leeds Street entrance through a large conservatory. On either side of a corridor running the entire length of the block are the bedrooms and necessary bathrooms, and at the end of this passage is a spacious octagonal sitting-room. This description applies to each of the three floors into which the block is divided. The sitting-room on the second floor also combines a library. Attached to the home is a school for teaching hospital cookery. The basement is occupied by the chapel and hospital library.

The new hospital covers the site occupied by the old building. The contractors for the hospital, which is faced externally with red Ruabon bricks, have been Messrs. Thornton & Sons, of Liverpool, and the clerk of works was Mr. J. Gillings.

The Statue of the Empress Elizabeth at Salzburg, erected by the ladies of that city, was unveiled recently by the Emperor of Austria.

Society of Arts: Applied Art Section Committee.—At the last meeting of the council the following were appointed to form the committee for the ensuing year: Sir William Henry Preece, Sir George Birdwood (chairman), Thomas Armstrong, Professor Church, Caspar Purdon Clarke, Alan S. Cole, Sidney Colvin, Walter Crane, Lewis F. Day, I. Hunter Donaldson, Major-General Sir John Donnelly, Arthur Evans, Sir John Evans, Hon. Sir Charles W. Fremantle, J. Starkie Gardner, William Gowland, Arthur Lasenby Liberty, Sir Villiers Lister, T. Buxton Morrish, J. Hungerford Pollen, Sir Edward Poynter, Sir Walter S. Prideaux, Sir W. C. Roberts-Austen, Alexander Siemens, A. B. Skinner, John Sparkes, R. Phené Spiers, Hugh Stannus, H. H. Statham, Joseph William Swan, Carmichael Thomas, John I. Thornycroft, Sir Thomas Wardle and Henry B. Wheatley (secretary).

Keystones.

The National Gallery (Purchase of Adjacent Land) Bill has been passed.

Dursley Parish Church is being renovated by Messrs. King, of Gloucester.

Illness of Mr. Alfred Waterhouse, R.A.—We regret to learn that Mr. Alfred Waterhouse, R.A., who is staying at his country residence at Yattendon Court, near Newbury, is ill.

The Old Racecourse Buildings at Ascot are to be pulled down to make way for new and more commodious erections, which are to be completed by the next race meeting.

A New School at Eaglesham, Glasgow, has been erected from designs by Mr. Alexander Petrie, architect, of Glasgow. The building occupies a site on the Strathaven Road, and accommodation is provided for 220 scholars. The cost is estimated at £2,800.

New Public Baths at Elland are in course of erection on land adjoining the Public Offices. The scheme, which entails an outlay of £6,000, has been entered upon at the express wish of the ratepayers as Elland's recognition of the Diamond Jubilee of the reign of the late Queen Victoria.

Chester Cathedral Restoration.—Sir Horatio Lloyd, one of the honorary secretaries of the committee which is carrying out the restoration of the south transept of Chester Cathedral as a memorial to the late Duke of Westminster, announces that the total cost will be £9,720, and of this £8,718 has been subscribed.

The Birkenhead Town Hall Fire has caused damage assessed at over £15,000. The tower, with the clock and the cupola, the valuable stained-glass roof over the council chamber, the council ante-room, and the roof of the main building will, it is understood, be repaired and rebuilt to its former condition, and this cannot be done for less than the amount stated above.

One of the Leaning Towers of Italy, it is reported, is in danger of falling. Fortunately it is not the Pisan marvel, but an ungraceful square brick monument which rises almost to the same height as the Tower of Pisa, and is situated in Bologna. The municipality is trying to patch up the cracks, thereby thinking to avert danger, but the Italian Press does not share this optimism, and has demanded that a more serious effort be made for ensuring the structure from ruin and the safety of the people who dwell in its shadow.

College Street Archway, York.—At the last meeting of the York City Council a discussion arose with respect to the improvement of College Street and the pulling down of the old gateway. The Streets and Buildings Committee recommended that the city engineer be instructed to proceed with the pulling down of the archway at once, and that the further consideration of a new street be adjourned. Alderman Agar, in moving the adoption of the recommendation, said the pulling down of the archway would not hinder them from going on with a new street to the south side of the Minster. A great deal had been said about keeping up the archway, but personally he thought its demolition would open up one of the finest views of the Minster. Alderman Sir J. S. Rymer moved as an amendment: "That, subject to satisfactory arrangements being made for a new road in lieu of College Street, this council is willing to cancel the agreement dated March 19th, 1901, with Mrs. S. R. Wood, for the purchase of College Street Archway, and that all resolutions inconsistent with this resolution be rescinded." He repudiated any love for the arch, but expressed his great love for the Minster, and his belief that no right-minded citizen would wish to do anything that would in any way endanger that structure. The advisers of the Dean and Chapter contended that the traffic through College Street past the Minster had considerably interfered with the stability of the east end, and surely their opinion was entitled to respect. If they succeeded in getting a new street, what did it matter whether the arch stopped up or came down? The amendment was carried.

The New Victoria Wing to Blackburn Infirmary has been opened. The cost has been £11,500.

A Bust of Louis Français, the landscape painter, was unveiled at Plombières last week.

A Bust of Clairon, the actress, was unveiled recently at Condé sur l'Escaut.

A Correction.—In the notice of the Lawrence Patent Water Softener and Sterilizer Co., Ltd., of Norland Works, Uxbridge Road, Notting Hill, W., which appeared on page x of our last issue, the cost of working their apparatus was erroneously stated to be 13s. 4d. instead of 1¾d. per 1,000 gals. We regret the error.

Discoveries at Canterbury.—Discoveries have been recently made in the course of excavating the ruins of St. Augustine's Abbey, Canterbury, of a gold noble of Edward III., the leaden seal which had been attached to a bull of Pope Alexander III. (1159–81), and remains of an Early Saxon chapel dedicated to St. Pancras.

The Leeds and Yorkshire Architectural Society paid a visit on Thursday last to Wheatfield Lodge and Castle Grove Headingly. The excursion was conducted by Mr. Butler Wilson, F.R.I.B.A., president of the society from whose design these two houses have recently undergone alterations and additions.

A Statue of the late Duke of Devonshire, which was for some time on view at the Royal Academy, was unveiled on the sea front at Eastbourne last Saturday. The statue represents the late duke in a sitting posture, wearing his robes as Chancellor of the University of Cambridge, and Mr. Goscombe John, the sculptor, is considered to have produced an excellent likeness.

Failure of Mr. Alfred Gilbert, R.A.—At the London Bankruptcy Court last week an application was made to Mr. Registrar Giffard for a receiving order against the estate of Alfred Gilbert, R.A., who has presented his own petition, describing himself as of 16, Maida Vale, sculptor. Upon the application of Mr. Guilford E. Lewis, the registrar made the usual receiving order. Nothing was stated as to the debts or assets.

The New War Office is begun. The huge pit opposite the Horse Guards, which has been "setting" for the past few months after its thick inlay of concrete, is now in possession of the first batch of builders, who are preparing to lay the foundations. Scaffolding and cranes are springing up out of the concrete depths, and in many other ways there are indications of the beginning of the first of the two new Government buildings. The walls and bed of concrete which were first constructed were necessitated by the unstable subsoil of the river bank.

Gold and Silver Work at the Louvre.—All the objects of mediæval and Renaissance gold- and silver-smiths' work left by Baron Adolphe de Rothschild to the Louvre have now been placed in that establishment. They are in a special room. The collection of objects of art was highly valued by the baron, and chiefly consists of reliquaries, statuettes, chaplets or rosaries, medallions, medals, monstrances for the Sacrament, ciboriums, chalices and miniatures of the thirteenth, fourteenth, fifteenth and sixteenth centuries. These precious articles are in gold, silver, enamel, bronze, rock crystal, and so on. They are splendid specimens of Italian and Flemish work, notably the reliquaries. The collection will not be open to the public for some weeks to come. The Cluny Museum has also received fourteen objects of art from Baron Adolphe de Rothschild's collection.

New Factory for Messrs. Broadwood.—An opportunity for acquiring a unique site either for manufacturing premises or town properties has arisen owing to the decision of Messrs. Broadwood, pianoforte manufacturers to his Majesty the King and Queen Alexandra not to remove their works from London as was originally proposed. They have purchased a freehold site for their new factory at Bow, and are contemplating the disposal of their Bedford property, which consists of more than twenty acres on the west side of the town immediately adjoining a quarter which is rapidly developing. The site is most suitable for building operations of any kind, being perfectly level, the soil gravel, and close to the town, the river and the railway station. Architects or builders can obtain full particulars from Messrs. May & Rowden, 39, Maddox Street, London, W.

TO NON-INSURED READERS.

From time to time we have queries addressed to us by readers on points affecting our Accident Insurance Schemes. The greater number of the queries relate to the conditions of payment, and to enlighten those who may still be in doubt we think it desirable to state

(1.) That it is not necessary to subscribe direct to the office in order to secure the benefits.

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(3.) It is sufficient to have an intimation from the newsagent that he supplies copies regularly.

(4.) That policies can be issued either direct to the subscriber or through the newsagent, whichever may be preferred.

(5.) In applying it is not necessary to write a long letter—a postcard will do, giving the full name and address of the newsagent from whom the copy is obtained.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERDEEN.—For the erection of a new wing to complete extension of Blair's Catholic College, near Aberdeen. Mr. R. G. Wilson, architect, Aberdeen. Accepted tenders:—

Masonry, J. King.
Joinery, J. Henderson.
Slating, F. Morrison.
Plasterering, Bannochie & Sons. } £12,000.
Plumbing, Thorn & Strachan.
Painting, E. Copeland.
All of Aberdeen. Schedules by architect.

ABERGAVENNY.—Accepted for the erection of house and the building of stores, pathological rooms, new boiler house, chimney shaft, &c., 112 feet high, at the Monmouthshire Asylum, Abergavenny, for the Visiting Committee. Mr. B. J. Francis, architect, Abergavenny:—

J. G. Thomas & Sons, Abergavenny £4,207

BANGOR.—For the erection of lock-up premises at Upper Bangor. Mr. W. G. Williams, architect, 22 High Street, Bangor:—

R. & J. Williams	£896	0
William Parry, Junr.	879	4
Watkin Jones	878	4
Jones & Evans	837	0
Richard Lewis*	805	0

Architect's estimate, £820.
*Recommended for acceptance.

BANGOR.—For the erection of No. 13 Dean Street, Bangor, for Mr. H. Walford. Mr. W. G. Williams, architect, 22, High Street, Bangor:—

Wm. Parry, Junr.	£519
R. & J. Williams	519
Watkin Jones*	499

(All of Bangor.)
*Recommended for acceptance.

BRIGHTON.—For the erection of a residence in Victoria Road, Brighton, for Messrs. Jenner & Banfield. Mr. W. C. F. Gillam, M.S.A., architect, Brighton:—

Saunders Bros.	£1,829	Penfold	£1,627
Field & Co.	1,827	Brown & Sons*	1,586
Lynn	1,647		

[All of Brighton.]
* Accepted.

BRIGHTON.—For the erection of a residence in Victoria Road, Brighton, for James Brooke, Esq. Mr. W. C. F. Gillam, M.S.A., architect, Brighton:—

Saunders Bros.	£1,745	Brown & Sons*	£1,179
Field & Co.	1,260	Penfold	1,137
Lynn	1,233		

[All of Brighton.]
* Accepted.

COWDENBEATH (FIFESHIRE).—For supplying and laying down 4,000 yds. of fireclay pipe drains, and the construction of about 50 manhole ventilating shafts, &c. for the Police Commissioners. Messrs. Buchanan & Bennett, C.E., engineers, 12, Hill Street, Edinburgh:—

W. C. Harvie & Co., Glasgow	£3,602	14	5
Nimmo & Coupar, Cowdenbeath	3,047	12	0
R. Brebner, Edinburgh	2,838	10	0
D. & J. Stratton, Edinburgh	2,814	16	10
J. Martin, Dunfermline	2,719	0	5
G. Mackay & Son, Edinburgh	2,662	11	4
Henderson & Duncan, Edinburgh	2,499	3	7
W. Isbister, Eskbank	2,466	10	0
W. Caragher, Dunfermline	2,394	17	2
D. Gilmour, Kirkcaldy	2,067	15	8
J. Kirk, Cowdenbeath	1,859	12	0

GLENGARIFF (IRELAND).—For an addition to the Eccles Hotel. Mr. Arthur Hill, B.E., M.R.I.A., architect, 22, George's Street, Cork:—

S. Hill, Cork	£5,641	0	0
W. O'Connell, Cork	5,580	0	0
W. H. Jones,* Dunmanway	5,092	9	2

* Accepted.

KING'S LYNN.—For work in alterations and additions to the "Naval Reserve" public house, St. Ann Street, Lynn, for Messrs. W. & T. Bagge. Mr. Herbert Tilson, architect, Railway Road, King's Lynn:—

W. H. Brown	£1,292	0
Tash, Langley & Co.	1,275	15
Spragg & Son	1,247	0
Hill & Horsley	1,229	0
J. Medwell	1,159	10
Read & Wildbur	1,116	10
J. Bone	1,089	0
H. W. Barnes & Co.*	1,080	18

[All of King's Lynn.]
* Accepted.

LITTLEHAMPTON.—For the construction of reservoir, house, cottage, &c., Batworth Park. Mr. H. Howard, engineer, Town Offices, Littlehampton. Quantities by Mr. C. F. A. Poland, John Street, Bedford Row, W.C.:—

Linfield & Son	£8,975	0
A. Burrell	8,366	10
Snewin Bros.	8,327	0
Peerless, Dennis, & Co.	8,149	0
W. Wallis	7,989	0
A. E. Nunn,* Tenterden, Kent	7,868	2

[Engineer's estimate, £8,030.]
* Accepted.

LONDON, N.—For the erection of Tollington School, Tetherdown, Muswell Hill. Mr. Alfred Conder, architect, Palace Chambers, Westminster:—

W. Akers & Co.	£2,255
T. D. Steed & Son*	2,100

* Accepted subject to certain omissions.

LONDON, S.W.—Accepted for alterations and fittings to 16, James Street, Haymarket, S.W., for Messrs. Simpkin, Marshall, Hamilton & Kent. Mr. Francis Hooper, F.R.I.B.A., architect, 12, Norfolk Street, Strand, W.C.

Builders' work and fittings, Higgs & Hill, Ltd.
Electric goods lift, Smith & Stevens.
Electric lighting, H. Farmer & Co.
Telephones, Roger Dawson.
Plumbing, Dent & Henyer.

MORECAMBE.—For the erection of Sion Baptist Chapel, Victoria Street. Mr. Albert Gorton, M.S.A., architect, 24 The Crescent, Morecambe. Accepted tenders:—

H. Ramsbottom, mason	£2,200	4
J. Greenwood, joiner	1,070	0
Cross & Webb, plumbers and glaziers	519	10
Hill & Nelson, plasterers and slaters	288	5
George Roe, painter	60	16

SUTTON.—For building an electricity generating station and chimney shaft, for the Electrical Power Distribution Co., Ltd. Mr. W. C. F. Gillam, M.S.A., architects, Brighton:—

Chimney Shaft.

Harper & Moore, Stourbridge	£2,822	0	0
Cooke, London	2,611	0	0
Longley, Crawley	2,500	0	0
Yates, London	2,453	0	0
Potter, Sutton	2,442	0	0
Myles & Warner, Stalybridge	2,184	0	0
Gibb, London	2,100	0	0
Field & Co., Brighton	2,077	0	0
Shopland, Sutton	2,070	0	0
Johnson, Leicester	2,009	0	0
Jones, Sutton	1,961	0	0
Hughes & Stirling, London	1,950	0	0
Lovatt, London	1,900	0	0
Potter, Horsham	1,880	0	0
Warrington, Manchester	1,820	10	7
Hibberd, London	1,726	0	0
Wallis, Balham	1,725	0	0
Myles,* Dukinfield	1,491	0	0

* Accepted subject to deductions.

For Electricity Station Buildings.

Cooke, London	£8,768	0	0
Longley, Crawley	7,650	0	0
Gibb, London	7,495	0	0
Freeman, Sutton	7,200	0	0
Field, Brighton	7,070	0	0
Patman & Fotheringham, London	6,853	0	0
Hibberd, London	6,792	0	0
Cooke, London	6,775	0	0
Lovatt, London	6,735	0	0
Rowland, Horsham	6,692	0	0
Rogers, Sutton	6,680	0	0
Potter, Sutton	6,499	0	0
Wallis, London	6,490	0	0
Potter, Horsham	6,470	0	0
Shopland, Sutton	6,427	0	0
Jones,* Sutton	6,281	0	0

* Accepted subject to deductions.

SUTTON.—For roof trusses and gallery and other steel construction, for the Electrical Power Distribution Co., Ltd. Mr. W. C. F. Gillam, M.S.A., architect, Brighton:—

Jones & Co.	£580	9	6
St. Pancras Ironwork Co.	455	0	0
Every, Lewes	454	12	0
Aston & Son*	425	10	0

* Accepted.

SWANSEA.—For the erection of a new art gallery, &c., at the Royal Institution of South Wales, Swansea. Mr. H. C. Portsmouth, M.S.A., architect, 6, Fisher Street, Swansea:—

William Lane	£1,020	0	0
H Billings	1,010	10	0
T. & F. Weaver	1,006	0	0
Bennett Bros.	982	5	7
T. Richards	965	0	0
T. Marles & Sons*	892	10	11

(All of Swansea.)
*Accepted, subject to certain modifications.

TEIGNMOUTH.—For alterations and additions to the isolation hospital, for the Teignmouth Urban District Council. Mr. C. Jones, surveyor:—

Mingo & Boone, Exeter	£1,435
E. Andrews, Teignmouth	1,210
I. Cornelius, Teignmouth	1,185
F. Francis, Teignmouth	1,112

WALLINGFORD.—For proposed alterations and additions to the Wallingford Grammar School (second portion of extension scheme). Mr. Sidney R. Stevenson, architect, 12, Burns Street, Nottingham:—

W. J. Bloxam, Banbury	£2,127	0
Bosher & Sons, Cholsey, Berks	1,902	0
H. Harris, Great Marlow	1,858	0
J. J. Adams, Nottingham	1,800	0
McCarthy Fitt, Reading	1,777	0
Brasher & Sons,* Wallingford	1,658	0
A. J. Colbourne, Swindon	1,641	11

* Accepted.

WEALDSTONE (MIDDLESEX).—For the surface-water drainage and the construction and completion of roads and paths in connection with the proposed new cemetery, for the Urban District Council. Mr. F. Hill Parr, C.E., Surveyor:—

R. Ballard, Ltd.	£1,935	11	0
Meston & Hale	1,921	17	6
W. Neave & Son	1,719	3	8
E. W. Hollingsworth	1,674	6	1
T. Adams	1,645	12	4
W. Mann	1,488	0	0
G. Wilson*	1,388	0	0

[Surveyor's estimate, £1,526 4s. 10d.]
* Accepted.

WINDSOR.—For the necessary sewering, levelling, &c., required for new road near the Thames, for the Town Council. Mr. E. A. Strickland, borough surveyor:—

T. Free & Sons	£1,520	0
Butcher & Hendry	1,293	0
B. Nowell & Co.	1,154	0
A Green	1,145	18
J. Mowlem & Co.	1,066	0
W. Manders	1,055	0
W. H. Wheeler,* Blackfriars Road, London	994	0

* Accepted.

COMING EVENTS.

Thursday, August 22.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion to Parson Byres Quarries, leaving Newcastle Central Railway Station at 10.5 a.m.

Saturday, August 24.

ARCHITECTURAL ASSOCIATION.—Fifth Summer Visit to Inspect the Presbyterian College, Cambridge, by permission of the architect, Mr. H. T. Hare.

Thursday, August 29.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Meeting and Dinner, Holborn Restaurant, 9.30 p.m.

Monday, September 2.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. E. J. Steegmann, M.B., on "Mechanical Physics; Laws of Motion, Hydraulics, &c." 7 p.m.

Tuesday, September 3.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow (First day).

INTERNATIONAL ENGINEERING CONGRESS.—Opens in Glasgow.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Aug.	24	Nelson—Central Station	Electricity and Tramways Committee	B. Ball, Borough Engineer and Surveyor, Nelson.
„	24	Walsall—Town Hall	Corporation	R. H. Middleton, Borough Engineer, Walsall.
„	24	Mynachlogddu, Wales—Schoolroom	School Board	W. J. Williams, 1 High Street, Cardigan.
„	24	Aberdare—Alterations, &c.	—	T. Rees, 28 Mount Pleasant Street, Trecynon.
„	24	Market Weighton, Yorks—Chapel	Primitive Methodist Connexion	W. G. Smithson, 13 Bond Street, Leeds.
„	26	Ilford—Buildings	Urban District Council	H. Shaw, 7 Cranbrook Road, Ilford.
„	26	Stewartstown, Ireland—Lecture Hall	—	H. Hobart, Architect, Dromore, co. Down.
„	26	Hove—Laboratory, &c.	—	H. H. Scott, Borough Surveyor, Town Hall, Hove.
„	27	Sturminster—Infirmary	Guardians of Union	C. Hunt, Architect, The Close, Blandford.
„	27	Truro—Cattle Market	City Council	M. Lea, City Engineer and Surveyor, Truro.
„	27	Birkenhead—Mortuary	Corporation	C. Brownridge, Borough Engnr. & Surveyor, Town Hall, Birkenhead
„	27	Warwick—Mortuary	Town Council	Borough Surveyor's Offices, Warwick.
„	27	Aylesbury—Culverts	Rural District Council	W. J. Cook, 69 High Street, Aylesbury.
„	28	Leavesden, near Watford—Alterations	Metropolitan Asylums Board	Newman & Newman, 31 Tooley Street, London Bridge, S.E.
„	28	Rustington, Sussex—Seaside Homes	Metropolitan Asylums Board	R. Plumbe, 13 Fitzroy Square, W.
„	28	Norwich—Alterations and Additions	Guardians of Poor	J. B. Pearce, Surveyor, Upper King Street, Norwich.
„	28	London, S.W.—Staircase	Guardians of St. George's Union	E. T. Hall, 54 Bedford Square, W.C.
„	28	Swinefleet, near Goole—Porches	Reedness United District School Board	F. Chambers, Clifton Gardens, Goole.
„	29	Reading—Swimming Bath, &c.	Corporation	J. Bowen, Borough Engineer and Surveyor, Town Hall, Reading.
„	30	Denbigh—Additions to Asylum	Committee of Visitors	T. M. Lockwood & Sons, Foregate Street, Chester.
„	30	Tynemouth—Alterations	School Board	F. R. N. Haswell, Tyne Street, North Shields.
„	31	Whitley, Northumberland—Police Station, &c.	—	J. Cresswell, County Architect, Moothall, Newcastle-on-Tyne.
„	31	Belmullet, Ireland—Rectory	—	R. Carson, Belmullet.
Sept.	2	Middlesbrough—Asylum Extensions	Visiting Committee	A. Sockett, Clerk to the Committee, Municipal Bldgs., Middlesbrough.
„	2	Doune, Scotland—Station Buildings	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
„	3	Boston, Lincs—Cookery Centre, &c.	School Board	J. Rowell, Borough Surveyor's Office, Market Place, Boston.
„	3	Enfield—School	School Board	G. E. T. Laurence, 22 Buchanan Street, Adelphi, W.C.
„	3	Knightstown, Ireland—Coastguard Station	—	Public Works Office, Dublin.
„	4	Leeds—Hospital Extensions	Sanitary Committee	Clerk of Works Office, Seacroft Hospital.
„	5	Holyhead—School	—	J. Owen, Menai Bridge.
„	9	War Department Contracts (Aldershot)—Repairs and Materials.	—	Sub-District Commanding Engineer, South Aldershot, R.E. Office.
„	16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
„	19	Kirkmichael, Scotland—Rebuilding	—	J. Sim, Architect, Montrose.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING:		
Aug. 24	Parcgwyllt, near Bridgend—Electric Lighting	——	H. W. Davies, Clerk of Asylums, Bridgend.
" 24	Leigh, Lancs—Dynamos	Electricity and Tramways Committee	J. Foster, Electricity Works, Leigh, Lancs.
" 24	Dundee—Turntable	Harbour Trustees	J. Thompson, Jun., Harbour Engineer, Dundee.
" 24	Manchester—Electrical Repairing Stores	Tramways Committee	J. M. M'Elroy, Tramways Department, 55 Piccadilly, Manchester.
" 25	Havana—Sewerage System, &c.	——	Lieutenant W. J. Barden, Chief Engineer, City of Havana.
" 26	Fenny Stratford—Sewage Disposal Works	Urban District Council	J. Chadwick, Engineer, Bletchley, Bucks.
" 26	Warlingham, Surrey—Electric Lighting	Croydon Town Council	Borough Engineer's Office, Town Hall, Croydon.
" 26	Newmarket—Water Supply	Rural District Council	S. J. Ennion, Clerk to the Council, Newmarket.
" 27	Farnham—Electricity	Urban District Council	R. Mason, Clerk to the Council, Farnham.
" 27	Glasgow—Gasholders	Corporation	W. Foulis, 45 John Street, Glasgow.
" 28	Dartford, Kent—Boilers, &c.	Metropolitan Asylums Board	A. & C. Harston, 15 Leadenhall Street, E.C.
" 29	Dartford—Repairing of Dolphins	Metropolitan Asylums Board	Offices of the Board, Embankment, E.C.
" 29	Bournemouth—Boilers, &c.	Corporation Tramways	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
" 29	Warrington—Washer-Scrubber	Gas Committee	W. S. Haddock, Gas Engineer, Warrington.
" 30	Walthamstow—House Wiring	Urban District Council	J. Enright, 47 Victoria Street, S.W.
" 30	Barton Regis, Bristol—Heating	Board of Guardians	A. P. J. Cotterell, 28 Baldwin Street, Bristol.
" 30	Glasgow—Tramway Works	Corporation	J. Young, 88 Renfield Street, Glasgow.
" 31	Bournemouth—Water Cooler and Crane	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
" 31	Cairo—Sleeping Car Service	——	Financial Secretary, Khartoum.
" 31	Ilford—Tramways	Urban District Council	J. W. Benton, Clerk, Council Offices, Ilford.
Sept. 2	Amsterdam—Electrical Tram Carriages and Rails	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No. 164, Amsterdam.
" 2	Leith, Scotland—Bridge	Town Council	Burgh Surveyor, Town Hall, Leith.
" 2	London, E.C.—Engines	Bengal-Nagpur Railway Co., Ltd.	Company's Offices, 132 Gresham House, Old Broad Street, E.C.
" 3	Middlesbrough—Coal-Handling Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 4	Ellesmere, Salop—Retort Bench	Urban District Council	R. E. Lloyd, 1 Willow Street, Ellesmere.
" 4	Aston, Birmingham—Plant	Urban District Council	R. P. Wilson, Consulting Engineer, Aston Manor.
" 5	Macduff, Scotland—Harbour Improvement	Town Council	J. Barron, 1 Bon Accord Street, Aberdeen.
" 5	Mansfield—Refuse Destructors	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
" 9	Swansea—Road Roller	Corporation	Borough Surveyor, Swansea.
" 9	Edinburgh—Electric Light Installation	——	Resident Electrical Engineer, Electricity Supply Station, Dewar Place, Edinburgh.
" 14	Batley—Permanent Way	Corporation	Lacey, Clirehurst & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
" 25	Middlesbrough—Pumping Engines	Sanitary Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
Oct. 1	Copenhagen—Bridge	——	Statsbaneaulaegenes Kōntor, Reventlowsgade, 10 Copenhagen, B.
" 1	Hadsund, Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes Kōntor, Reventlowsgade, 10 Copenhagen, B.
" 8	London, S.W.—Tramways	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 8	London, S.W.—Continuous Current Plant	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
Dec. 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under Secretary for Public Works, Sydney.
	IRON AND STEEL:		
Aug. 24	Manchester—Iron and Steel Works	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
" 26	Dublin—Sleeper Blocks	Great Northern Railway Co. (Ireland)	T. Morrison, Amiens Street Terminus, Dublin.
" 26	Horwich, Lancs—Iron Pipes	Urban District Council	Surveyor, Public Hall, Horwich.
" 28	Rickmansworth—Pipes, &c.	Urban District Council	W. H. Radford, Engineer, Albion Chambers, Nottingham.
" 30	Huddersfield—Girders	Corporation	General Tramways Manager, Great Northern Depôt, Huddersfield.
	PAINTING AND PLUMBING:		
Aug. 26	Morley, Yorks—Painting, &c.	General Purposes Committee	W. E. Putnam, Borough Engineer & Surveyor, Town Hall, Morley.
" 27	Chorlton—Outside Painting	Guardians of Union	Pater, Union Offices, All Saints', Manchester.
" 27	Alston—Repainting	——	N. Walton, Secretary, Town Hall, Alston.
" 27	Brighton—Painting	Guardians	B. Burfield, Clerk, Parochial Offices, Prince's Street, Brighton.
	ROADS AND CARTAGE:		
Aug. 26	Bootle, Lancs—Improvement Works	Corporation	Borough Engineer's Office, Bootle, Lancs.
" 26	Horwich, Lancs—Kerbs, &c.	Urban District Council	Surveyor, Public Hall, Horwich.
" 27	Walker, Northumberland—Street-Making, &c.	Urban District Council	T. W. Laycock, Council Chambers, Church Street, Walker.
" 27	West Hartlepool—Tar Pavement	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
" 27	Withington, Lancs—Street Works	Urban District Council	A. H. Mountain, Surveyor to the Council, Town Hall, Withington.
" 29	Basingstoke—Widening	——	G. Fitton, Borough Surveyor, Basingstoke.
" 30	Walthamstow—Private Street Works	Urban District Council	G. W. Holmes, Engineer to the Council, Town Hall, Walthamstow.
" 31	Bromley, Kent—Materials	Rural District Council	E. Hazlehurst, 98 High Street, Bromley, Kent.
Sept. 3	Carshalton—Granite, &c.	Urban District Council	W. W. Gale, Surveyor, Carshalton.
" 4	Hove, Sussex—Kerbing, &c.	Town Council	H. H. Scott, Town Hall, Hove.
" 4	Middleton, Lancs—Paving, &c.	Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton.
" 9	Nottingham—Forming, &c.	Guardians	A. Marshall, Architect, King Street, Nottingham.
" 10	Barking, Essex—Street Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
	SANITARY;		
Aug. 24	Dodworth, near Barnsley, Yorks—Sewering	Urban District Council	P. A. Hinchcliffe, 14 Regent Street, Barnsley.
" 24	Hindley, Lancs—Sewer	Urban District Council	A. Holden, Surveyor, Council Offices, Hindley.
" 27	Winsford, Cheshire—Sewer	Urban District Council	M. Wilkinson, Surveyor to the Council, Market Place, Winsford.
" 28	Rickmansworth—Sewerage Works	Urban District Council	W. H. Radford, Albion Chambers, Nottingham.
" 30	Valletta, Malta—Pipes, &c.	——	Superintendent of Public Works, Malta.
" 31	Thornton Hough, Cheshire—Cleansing Ashpits, &c.	Wirral Rural District Council	J. E. C. Ollice, 54 Hamilton Street, Birkenhead.
Sept. 2	Cleland and Omoa, Scotland—Sewer Works	District Committee of Middle Ward	W. L. Douglass, 3 Clydesdale Street, Hamilton.
" 2	Dunfermline—Sewers, &c.	District Council	W. A. Baird Laing, 13 George Street, Edinburgh.
" 3	Pembury, Kent—Sewers, &c.	Rural District Council	W. Vaux Graham, 5 Queen Anne's Gate, London, S.W.
" 8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
	TIMBER:		
Aug. 24	Dundee—Timber	Harbour Trustees	J. Thompson, Junr., Harbour Engineer, Dundee.
Sept. 3	Cristiania—Wood	——	Arms Factory, Kongsberg.
" 30	London, E.C.—Telegraph Poles, &c.	——	C. E. Stuart, Controller of Stores, General Post Office, E.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 31	Sheffield—Alteration of Ecclesall Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Sept. 16	Blackpool—Laying-out Land	£30, £15 and £5	Borough Surveyor, Town Hall, Blackpool.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
" 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
" 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	£40, £20 & £10	H. F. Gadsby, 15 Tenant Street, Derby.

New Companies.

St. Mary's Chambers, Ltd.

Registered August 7th to carry on the business of land, building and other property owners, builders, &c. Capital £10,000 in £1 shares.

Thomas Walker & Co., Ltd.

Registered August 7th to acquire the business of timber merchants and sawmill proprietors lately carried on by the executors of the late Thomas Walker at West Hartlepool. Capital £100,000 in £1 shares. The first directors are T. N. Robinson, S. H. Belk, T. S. Walker, S. Walker and E. W. Walker. Registered office: Mainsforth Terrace, West Hartlepool.

British Paving Co., Ltd.

Registered August 7th to deal in oils, asphalts, gases, bituminous substances and mineral deposits of all kinds, and to carry on the business of contractors for laying all kinds of pavements and building all kinds of structures. Capital £50,000 in £1 shares.

Aberfan Cottage Co., Ltd.

Registered July 22nd to acquire lands and buildings in the United Kingdom or elsewhere, to construct or erect and maintain any dwelling-houses, cottages and other buildings, and generally to carry on the business of land and property owners, managers, agents and dealers, builders, brick, timber, stone and cement merchants, sawyers, joiners, decorators, &c. Capital £7,500 in £10 shares. Registered office: Ffrwd Offices, Mountain Ash, Glamorganshire.

J. E. Newark & Co., Ltd.

Registered August 10th to acquire the business now carried on as J. E. Newark & Co. at Stoney Stanton Road, Coventry, to manufacture and deal in all kinds of articles in which timber or wood is used, and to carry on the business of sawmill proprietors, saw-millers, &c. Capital £5,000 in £1 shares. The first directors are W. Calcott, J. Griffiths and T. D. Smith. Registered office: 63, Stoney Stanton Road, Coventry.

New Star Window Co., Ltd.

Registered August 10th to carry on the business of window sash makers, builders of window frames and other parts and accessories, carpenters, joiners, &c.; to acquire the exclusive use of certain patents of E. G. Kendall. Capital £3,000 in £1 shares. The first directors are J. Johnson and Mrs. M. Hollinrake. Registered office: 65A, Oxford Street, London, W.

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0		—	
Clover, best	per load	4	5	0	5	10	0
Hay, best	do.	5	0	0	5	10	0
Sainfoin mixture	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	8	0	1	9	2
Colza Oil, English	do.	1	8	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	4	3	2	4	6
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	12	0	1	12	3
Petroleum, American	per gal.	0	0	5⅝	0	0	5¾
Do. Russian	do.	0	0	4⅞		—	
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	14	0	3	15	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	6	6		—	
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	6	6	1	6	9

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	83	0	0		—	
Iron, Staffs., bar	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0	11	10	0
Lead, pig, Spanish	do.	11	10	0	11	12	6
Do. do. English common brands	do.	11	17	6	12	0	0
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	15	0
Do. Mild Bars	do.	6	15	0	7	1	0
Tin, Foreign	do.	115	5	0	115	15	0
Do. English ingots	do.	117	10	0		—	
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	15	0	16	17	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	8	5	0	13	15	0
Do. do. 4th & 3rd	do.	11	0	0	11	15	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd "	do.	19	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	7	0	0	16	5	0
Do. White Sea	do.	11	15	0	13	15	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	do.	18	5	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	6	0	0	9	0	0
Flooring Boards, 1in. prepared, 1st	per square	0	11	6	0	13	6
Do. 2nd	do.	0	8	3	0	9	3
Do. 3rd &c.	do.	0	7	9	0	8	3

HARD WOODS.

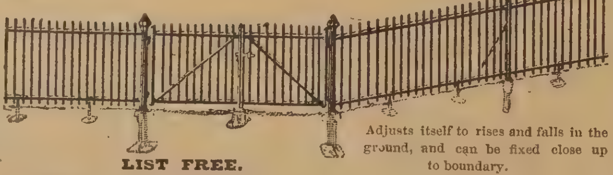
		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	4 5/32		—	
Do. Honduras	do.	0	0	3¾		—	
Do. Tobasco	do.	0	0	4		—	
Elm, Quebec	per load	0	12	6	5	10	0

BAYLISS, JONES & BAYLISS, LTD
WOLVERHAMPTON.
LONDON SHOW ROOMS:-
139 & 141 CANNON ST E.C.
CATALOGUES FREE.

PATENT SELF-ADJUSTING
No. 2750. Round Bar RAILING.

Is, we believe, the Cheapest Railing in the Market.

Can be had with Sharp Points without extra charge.



LIST FREE.

Adjusts itself to rises and falls in the ground, and can be fixed close up to boundary.

ROOFING SLATES:
Velinheli, Penrhyn, and Westmoreland.

SLATE SLAB GOODS:
Both Plain and Enamelled.

ALFRED CARTER & CO., LIVERPOOL.

ESTABLISHED 1851.
BIRKBECK BANK,
Southampton Buildings, Chancery Lane, London.
2½ % DEPOSIT ACCOUNTS repayable on demand. 2½ %
The BIRKBECK ALMANACK, with full particulars, post free.
FRANCIS RAVENSCROFT *Manager.*

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BLIND LATHS
go to
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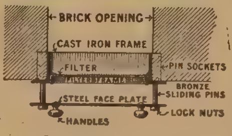
Estd LONDON. 1832.

THE OFFA VENTILATOR.

SECTIONAL VIEW.



ENLARGED PLAN.

Admits clean diffused air, absolutely without draught.
Opens like a drawer. Avoids opening windows.
Adjustable aperture. Air-tight when closed
Noiseless—no loose parts to rattle.

Prices and Particulars on Application.

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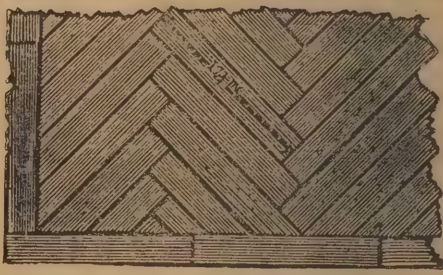
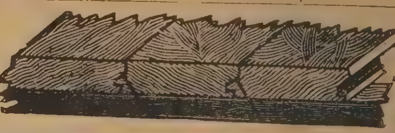
IRON ROOFS, WORKSHOPS, CHURCHES, PRINCIPALS, AND GIRDERS.

E. F. BLAKELEY & Co.,
Vauxhall Steel & Iron Works, Liverpool.

FLOORING BLOCKS.



Per 100 Blocks out of sizes.	YELLOW		PITCH PINE
	At Wharf.	ex Ship within one month.	At Wharf.
17¼ × 3 × 3	13 8	12 9	17 6
17¼ × 3 × 2	8 11	8 2	12 6
17¼ × 3 × 1½	6 10	6 3	9 6



PRIME DRY OAK & PITCH PINE FLOORING,
With Special Joint to conceal Nails—
1¼ × 4½ Oak, 56/9 Pitch Pine, 26/9 per square
1 × 4½ " 45/6 " 22/6 "
These prices include desiccation.

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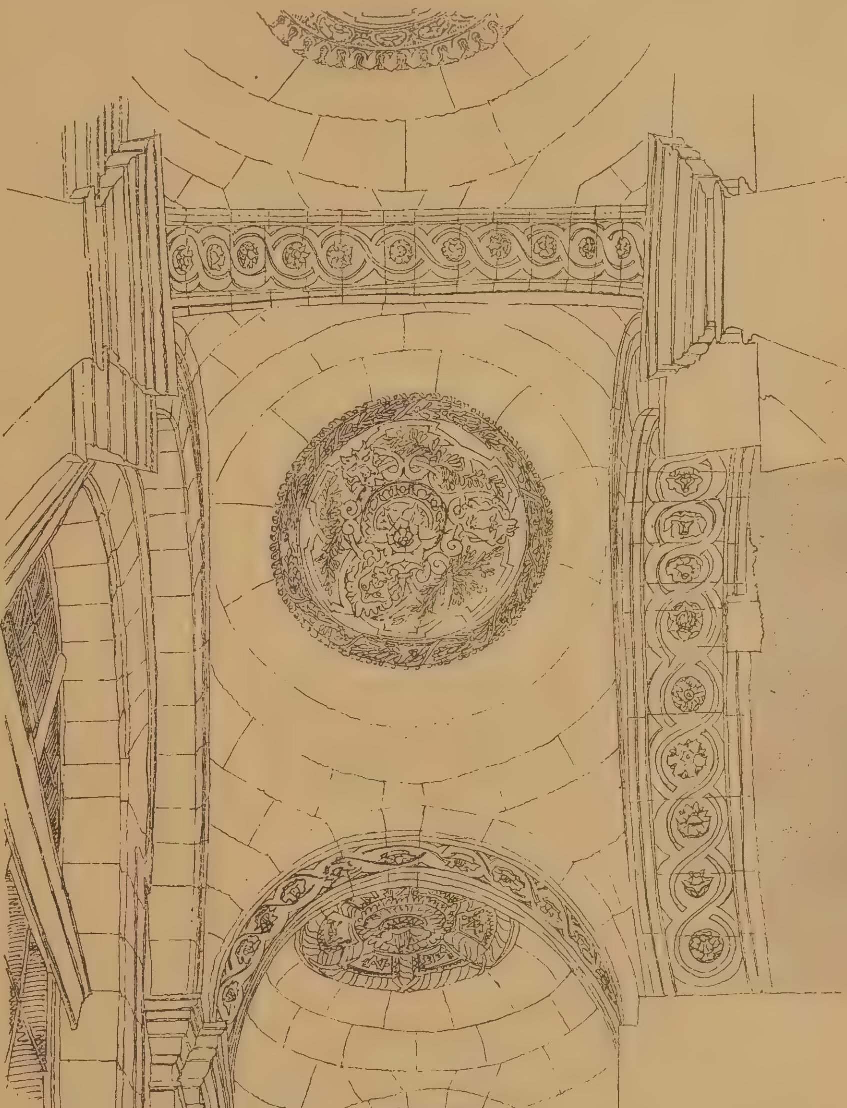
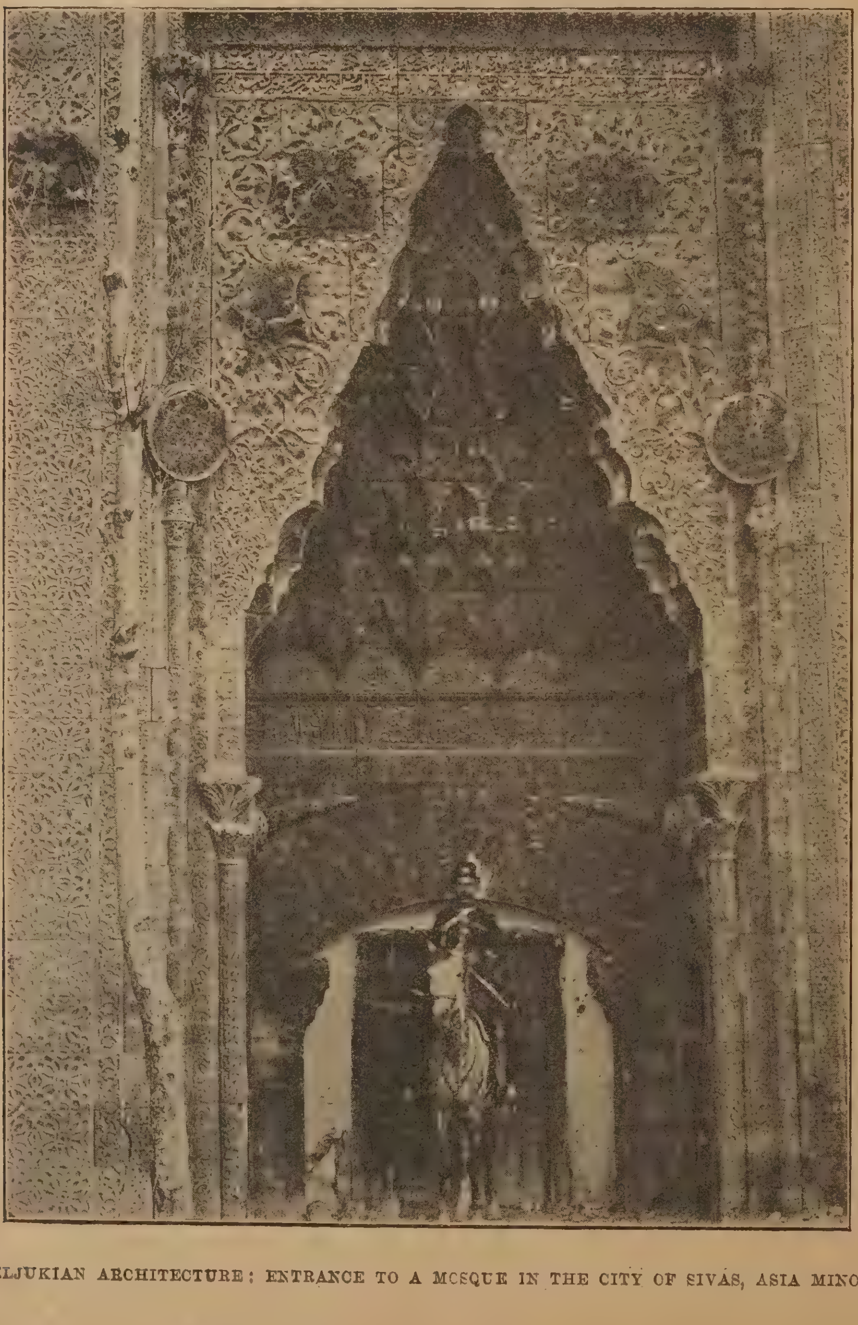
An Architectural Causerie.

The Public Press and Architecture. WHENEVER questions of taste are under discussion among those who consider themselves cultured, the opinion is invariably expressed that the public has no taste, or, to be more correct, has bad taste. To some persons this explains why popular art and architecture are of such inferior merit, others asserting that just in proportion as the art is bad so is the public taste which it governs. This applies equally to literature and the drama: either the bad taste of the public is responsible for commonplace books and trivial plays, in accordance with the law of supply and demand, or the "producers" capture the public and tell them what they need, even though it be what Carlyle terms "the black slough of platitude." Whatever be the reason—and we have our own opinion—the fact remains that public taste follows a low standard. This is not flattering to us as a nation, and it therefore behoves anyone in a position to do so to endeavour to set a better standard of excellence before the public; it is futile to act on Mr. George Moore's advice and "kick the brute in the ribs." Considering how public opinion is governed by the daily press, it is to be regretted that its influence is so feeble in the domain of architecture—in fact its influence is too often most harmful. In this connection we may refer to the article on "Some Handicaps of American Provincial Architecture" in our issue for August 8th, 1900, in which Mr. E. C. Gardner said: "I have never seen or heard of a newspaper, however high its journalistic standards, however earnestly it strives to be impartial, however faithful and without regard to profit or popularity it espouses what it conceives to be the right side of the questions that have a right and a wrong side, however valiantly it tells the truth in other matters of public and private concern—I have never seen or heard of a paper whose influence upon the architecture of its local field was not damaging rather than beneficial. Nothing is more essential to the healthful development of art in all forms than intelligent public criticism—judicious recommendation of the good and frank; explicit, detailed condemnation of the bad. Music, the drama, landscape, architecture, painting and monumental statuary are criticised wisely and often most healthfully by the competent writers employed by the best provincial journals. But the moment they touch the architecture that lies nearest them, and of which simple but uncompromising criticism would be valuable, their pens are dipped in oil. Now it is undoubtedly true, whether happily or otherwise, that the opinions of the great majority of people in all matters æsthetical are largely determined by the comments and intimations of the public journals. So it happens that in architecture whatever the newspapers approve (and to an extent they are obliged to approve every new growth, even if it is a parasite or a mushroom, or be accused of a lack of proper public spirit) is accepted as good, and, woe the day, is sure of imitation." With slight alteration this can be applied to England as to America. The public press abounds with foolish criticisms of architecture. The latest that has caught our eye concerns Short's in the Strand. Owing to their old premises being demolished for the clearance of the site for the new Gaiety restaurant and theatre, it was decided to move a few doors away and utilise the "Coach and Horses" for a time. Accordingly, a temporary front has been erected on the new building line and behind the old front of the "Coach and Horses," which is now being pulled down, exposing Short's new front. Now this is what a London daily newspaper which counts its readers by hundreds of thousands has to say about this "new old building": "Beams, plaster and the rough mortar work of Tudor times are adopted by the firm as good materials for ornamental and cheap temporary premises. Temporary only, for soon they will have to fall before the contractor's ruthless hands. It will be a nice little reminder of old England to see the finished building, cross-beams and all, standing out from among the useful but not ornamental brick structures around it. Other architects might take a leaf from Short's book, and instead of constructing ramshackle premises, might adopt the fashion of other reigns—in time making the Strand a study in historical architecture." Such nonsense as this needs no comment, but it is surprising that a paper of standing should print it. Does it tend to improve the public taste in architecture? As a matter of fact, the new front is practically a thin partition faced with sham half-timbering, so that it is hardly a "nice little reminder of old England," nor does it tend to make the Strand "a study in historical architecture." Unfortunately, examples like this one are easy to find in the public press, though now and again one discovers a criticism which shows that the writer knows what he is talking about: such is the case of the writer of the article on "Recent Building in Manchester" which we take the liberty of reprinting this week from the "Manchester Guardian." If the member of the staff of the London "daily" to which we have referred (and others of his kind) would observe the methods adopted in the "Manchester Guardian" article, instead of advising architects to "take a leaf from Short's book," the result would be more beneficial to architecture and better for the reputation of the public press as a critic of this subject.



VAULTING IN THE LOUVRE, PARIS. VISCONTI AND LEFUEL, ARCHITECTS.
DRAWN BY H. F. COOKE.

Two French Architects. THE following particulars are given in connection with the two illustrations of vaulting in the Louvre, Paris, and a balcony on the ground floor of the Pavillon de Marsan, which appear respectively on the previous page and on page 37:—Louis Visconti, the son of Ennius Quirinius Visconti, the celebrated archæologist, was born at Rome in 1791, and went to Paris seven years later. Here he became a student of Percier, and after gaining distinguished prizes at the Academy succeeded Delannoy in 1825 as the architect of the Royal Library in the Rue de Richelieu. Visconti designed numerous houses and hotels in Paris, chiefly in the suburbs of Saint-Germain and Saint-Honoré and in the quarters of the Michodière and the Chaussée-d'Antin. The fountains of Gaillon Square, Place Louvois and Place Saint-Sulpice, the monument to Molière in the Rue de Richelieu, and the tombs of numerous French marshals were also from his hands. But his two greatest works were the tomb of Napoleon the First, beneath the dome of the Invalides, and the plan for the completion of the junction of the Louvre and the Tuileries; the latter was begun in 1852, and everything had passed the foundation stage when Visconti died at the end of the following year. Visconti received the distinction of the Legion of Honour in 1846, was Architect to the Emperor in 1853, and became a member of the Institute and President of the Central Society of Architects during the same year.—Lefuel was born at Versailles in 1810 and died at Paris in 1880. He was a student of Huyot and secured the second Grand Prix of architecture in 1833 and the first Grand Prix in 1839. After a stay at Rome he came back to Paris and (in 1845) was nominated inspector of works of the Chamber of Deputies. He was architect of the Château de Meudon in 1848, of the Sèvres manufactory in 1852, and of the Château de Fontainebleau a year later. He had the fortune to fall into the good graces of Napoleon the Third, for whom he designed the new playhouse in the right wing of the Emperor's last residence. In 1845 Lefuel succeeded Visconti as architect in chief of the works of the new Louvre; the Grand Court was completed in 1857. Lefuel entirely restored the gallery at the edge of the water, joining the Pavillon de Lesdiguières with the Pavillon de Flore. This gallery was constructed between 1860 and 1870, and is remarkable for the three grand arcades which give access to the Place du Carrousel. During the same years Lefuel remodelled the Pavillon de Flore in the Tuileries from top to bottom, and built the new Salle des États leading on to the Place du Carrousel. A few years later he built the new Pavillon de Marsan. As his most successful works may be mentioned the grand hall and stair of the library in the Louvre. Lefuel also designed the hotels Fould and Nieuwerkerke, and the tomb of Auber.



SELJUKIAN ARCHITECTURE: ENTRANCE TO A MOSQUE IN THE CITY OF SIVAS, ASIA MINOR.

NOTES ON SELJUKIAN ARCHITECTURE.

By Rev. G. E. WHITE, of Marsovan, Turkey.

ABOUT the time that the Normans were stirring Western Europe a Turkish tribe called Seljuks rose out of the vast wilds of Turkestan, to turn and overturn in Western Asia. Toghrul Bey, Alp Arslan and Melek Shah were nearly contemporary with William the Conqueror and the leaders of the first Crusade. They rollicked not over the sea but the steppe, and they finally conquered and constructed for themselves a fair but short-lived kingdom in Asia Minor and the regions adjacent. The Seljuks belonged to the Mongol family of men, were first cousins to the Moguls of India, predecessors and distant relatives of Genghiz Khan and Tamerlane, and were the forerunners of the Ottoman Turks, into whose greater empire they were early merged.

The Seljuks soon lost their national identity, and few care anything for them now; but for two or three reasons their name deserves to be remembered. They were the ones who roused Christendom to that mighty upheaval known as the Crusades. The Holy City and the Holy Sepulchre had long been in the hands of Mohammedan Arabs, who treated their relatives the Jews and their rivals the Christians with comparatively good-natured contempt, kicking them occasionally lest they should forget the true feeling of a Mohammedan for a Christian. But when the Seljuks conquered the sacred shrines it was no good-nature with which they treated pilgrims, and a monk named Peter, of a small figure but a fiery soul, was roused by the indignities he saw heaped upon his fellow-pilgrims from Europe, and roused Pope Urban and all Christendom in turn, until they embarked upon the Crusades. Our purpose is served by noticing that this great movement was directed against Seljukian Turks.

As the Normans were early absorbed in greater empires than their own, so the Seljuks with their capital at Iconium soon gave way to the kindred kingdom of the Ottomans, with their capital, after 1453, at Constantinople. But even yet, when the accession of a new Sultan of Turkey calls for the ceremonial that corresponds with the coronation of a Western sovereign, the old Seljuk sheikh leaves his residence at Iconium and, journeying to the capital, performs the ceremony of girding upon the thigh of the new sovereign the sword of Othman.

The Seljuks also deserve a page in the history of architecture for their interesting public buildings of stone, vanishing remnants of which may be seen by the modern traveller almost anywhere in Asia Minor. As stated, the Seljuks were the near relatives of the Moguls—that is, Mongols who subsequently built the Taj Mahal at Agra, and worked so well in all manner of building with stone that some claim that their work in this line surpasses that of all other people.

The Seljuks left no single building worthy to be compared with the Taj Mahal, but Asia Minor is scattered over with mosques, gateways, fountains, Government buildings, religious colleges and other schools built from 400 to 800 years ago by the Seljuk Turks in a style which the Ottomans never emulated and no other people of this region ever imitated. The style is marked and its varieties are few. It is massive like the Hittite, though not so coarse. It lacks the delicacy and beauty of the Greek, though very beautiful in its own way. It has no sculptures of men or women, being Mohammedan and not Christian; and it has no representations of animals, being Mohammedan and not heathen. It seems to be connected with the architecture of Persia, the country to which all Turks look as the home of the fine arts. The best specimens all consist in the carving of the huge stones that form the front of some building. Rosettes, flower-work, wheels, rope-work, chain-work, squares, diamonds, and other geometric figures are traced with great beauty, variety and skill. Single buildings sometimes contain more than forty different patterns. One feature is the frequent use of tiles, which are arranged in patterns of different colours, and often give a fine effect to the minaret of some mosque.

Our illustrations show examples of Seljukian architecture in the ancient city of Sivas.

THE ARCHITECTURAL TREATMENT OF A GREAT UNIVERSITY.

THE architectural treatment of a great university is one of the most interesting and varied problems imaginable; and, by the natural conditions of change and growth, is a problem which is constantly presenting new phases, unforeseen combinations and unexpected possibilities. Each generation necessarily fails to meet the requirements of the next, and therefore unwittingly, with the best of intentions, places obstacles in the way of its successors which they in their turn, either from association or tradition, are loth to destroy, and which they try to utilise as best they may. There come therefore in the life of a university alternate periods of contented rest and of active change, as far as its buildings are concerned. The day of radical departures is postponed until they become inevitable, and are then undertaken with the haste of necessity. Oftentimes the architectural *ensemble* has gained in interest from the very diversity of the styles of different epochs, always provided these styles have intrinsic value in themselves.

"The universities of America," says the "Architectural Review" of Boston, Mass., "have been until recently comparatively poor in architectural merit, the University of Virginia alone being treated with distinct reference to effect as a whole. But within the last decade Columbia, Stanford, Princeton, the University of Pennsylvania, Washington University of St. Louis and California University have all received careful architectural study, both with reference to present needs and future growth. There are two very different styles of architecture adopted, one the monumental classic, formal in plan, vast in spaces; the other the more picturesque type, associated in our mind with the universities of England. Whatever differences there may be between these two types they agree in one particular, that is, that isolation of buildings is not productive of the best architectural effects. While the picturesque type has its masses bound together with walls and low buildings, the formal classic type attempts to arrive at similar results with pergolas, terraces, balustrades, &c. In fact, it is an open secret that the school study, the competitive plans and the first intention of most monumental classic schemes consists, on paper, more of accessories than of buildings themselves —accessories which are very apt to disappear under the stress of economy, as they have little or no claim to utility. On the other hand, the planning of the picturesque type is more compact, and its connecting units can be and are utilised.

"Apart from these considerations there is the element of material. The more highly organised architectural types, *i.e.*, styles of the perfected orders of architecture, demand the finest materials, otherwise they appear impoverished. There can be no rough work in connection with them. Each and every detail must be equally complete; and as a result it is the common fate of large classic *projets* to be pruned down to the most formal, dry and colourless results. This is not equally true of the picturesque type. It lends itself to changes, is adaptable to unexpected conditions, begins by demanding less and ends by giving more. A comparison between the écoles of France and the Scottish universities and the Halls of Oxford and Cambridge leaves little doubt as to which type is the more sympathetic with student life or with the later environment with the university Fellows. It is true that an academy in the ancient sense is imaginable, such a one as was to be formed at Syracuse, with its porticos, temples and halls, its stadium and theatre; but the elements of climate, of conditions of light, were those of a totally different character from the university of to-day; and, apart from this, the expenditure required to produce similar buildings to those in ancient Syracuse would be considered unjustifiable to-day, because the money could be used to better purpose in other directions.

"This preamble of general suggestion in regard to the two types, which are represented with us by the University of California and of Columbia and of Virginia on the one hand, and by those of St. Louis, Pennsylvania and Princeton on the other, is merely to explain certain remarks in regard to the present architectural activity at Harvard, the general schemes for the improvement of the College, and for bringing its buildings into harmony with each other as far as may be possible.

"Harvard was begun at a time when classic architecture was considered the only possible solution of any problem. We were essentially an English colony, and the architecture of the Georges was thoroughly established. It was as much a fashion as Victorian Gothic became later, and both these styles have this in common, that they were attempts, more or less successful, to imitate a fine architecture, of fine materials, a stone architecture of the Renaissance and the stone Gothic cathedrals, in poorer materials and with a minimum of detail. The impression of economy is only too evident in many cases. There appeared a series of buildings in brick and wood, which were not brick architecture nor wood architecture, but were an impoverished imitation of stone architecture. The classic forms were perpetuated, nothing more. When these buildings had simple walls with windows of good proportions, a cornice and a porch, they had the virtues of simplicity and scale, they adequately expressed the requirements and the possible expenditure of a small university in a young land. They set their seal upon Harvard, and it is now impossible to ignore them or to break away far from their suggestion, as is evidenced by Sever Hall and the Fogg Museum. Later there came a period of Victorian Gothic influence, in the 'seventies, when Weld and Matthews and Memorial Halls were built, and later still the Richardsonian touch in Sever Hall and the Law School. It is fairly conceded now that these departures were not successful, and their failure assisted the decision to return to the older Georgian type of Hollis, Holsworthy and University Hall. That type, however, is somewhat intractable. Its scale is small, both in masses and in openings. It ill brooks more than three storeys of height. It is best lying low and long, and any development means at once a reversion to classic courtyards, porches or porticos, terraces and balustrades. It is just on the border of the formally dignified.

"The original plan of the disposition of buildings at Harvard recognised this fact. They were placed around a large quadrangle, and there was evident intention to have a second quadrangle when the first was completed. But the buildings were isolated, and from that time to this all buildings at Harvard have been isolated, and the buildings outside the yard have been located with absolute disregard of mutual relationship. The problem of making these disconnected units into an organic whole is far from being a simple one, and several solutions have been offered. There is a unanimous opinion that some orderly arrangement of the buildings is necessary. The gates and wall around the grounds have gone far to give an impression of unity and seclusion, but the isolation of the buildings is still conspicuous. The integrity of the main quadrangle can be readily preserved. It would be a simple expedient to make low one-storey connecting links between Holworthy, Stoughton, Hollis and Harvard Halls, and a long arcade or colonnade at the back of University Hall, uniting Weld, University and Thayer Halls, and a similar colonnade in front of Grays, connecting Matthews, Grays and Weld. The second quadrangle, upon one side of which could be Sever Hall, was admirably suggested in Mr. Peabody's plan of some time ago; but this again could be united by connecting links of low buildings. Small quadrangles are by no means unattractive if the buildings about them are not too high, and a long low building from the south end of Thayer Hall to the north end of Sever Hall, with a corresponding mass back of the Library, would create a small quadrangle back of University Hall at right angles to the main quadrangle. In Jarvis and Holmes Fields, and in fact everywhere else in the University grounds, there are all sorts of possibilities; the only thing to be assumed is that order should be made out of the present chaos."

SELJUKIAN ARCHITECTURE IN THE CITY OF SIVAS, ASIA MINOR: THE GEOMETRICAL DECORATION.

ON ARCHITECTS.

By A COMMERCIAL TRAVELLER.

TEN years in architects' offices as pupil and assistant had taught me to look upon the commercial traveller as something very undesirable, a man to be got rid of as soon as possible, to be prevented at all hazards from penetrating into the inner sanctum of the principal. Of course there are individual exceptions, but I think it will be universally conceded that, generally speaking, the commercial traveller is not welcomed in an architect's office. There is perhaps, only too good reason why this is so, but in most cases commercial travellers have only themselves to blame if they are not treated with the courtesy that they desire.

But when one day I found myself in the position of the bagman—no longer inside the office but outside on the step seeking admittance from the very type of youth that once I myself had been—I saw the whole thing differently, or rather I felt the difference. Before, I may have sometimes had a mental sympathy for the traveller, but I don't think my feeling ever went beyond that. Now it was my duty to play the very part that before I had so often tried to spoil. But I am less concerned here with the troubles of the traveller than with the impressions that have been left on my mind, after two years of this life, concerning architects, and architects' assistants, and architects' offices.

If any architect is inclined to resent a traveller having "ideas" on the profession, I would ask him to remember that I was educated in the profession myself and that I have spent more years inside it than I have since spent on the road.

The remarks that follow will apply only to provincial architects, as my ground did not include the metropolis; but, outside London and certain other districts, I may claim to have been inside nearly all the architects' offices in England and Wales.

I commenced in the north, in a Yorkshire town. It was not many days before I was painfully aware that all architects who were not on the first floor of a building were either on the second or third. Rents, I suppose, are high—and so are architects' offices. Lifts are not yet universal, and even where you do find one you don't always find it working. Some sky-dwelling architects have speaking tubes from the entrance of the building up to their offices, which are no doubt a great convenience for clients but things to be avoided by commercial travellers. If you used them Mr. X. would invariably be out. In fact you soon come to learn, if you did not know it before, that you are not wanted. The office boy or the pupil you come to regard, after a short time, as a kind of natural enemy, a being standing between you and your victim. He, on the other hand, conceives it to be his duty to prevent you getting into that inner office which is the goal of your endeavours. The pupil, moreover, will not be slow to let you see that he is a professional man whilst you are only a "traveller." The airs that some of these youths assume would be amusing if at the time they were not so irritating. As a rule you receive far more courtesy from the principal than from the young gentlemen in the outer office. But these are small matters, and will be more or less familiar to all.

It was my duty to push the interests of a firm engaged in the production of a very high class of artistic work. I cannot, of course, state here the exact nature of that work. But it was of a quality that precluded its use in any but really good buildings. I soon found that my difficulties lay not so much with architects themselves as with the powers behind the architects—their clients. All over the country I have met with the same response: "Yes, we should very much like to be able to use such work, but we have no opportunity." And then would follow, in many cases, a recital of the trials of the architect wanting to do good work, but having to conform to the wishes of his clients in matters both of design and expense. It was not long before I had divided architects into three main classes. I find myself writing down in my diary, after little more than a month on the road, these words: "There are three types of architects: first, the good man who does good work; second, the little man who does filthy work; third, the good man who has to do poor work through lack of opportunity to do better. The first class you respect and possibly envy. The third class you pity, for theirs is a horrid position. The second class you despise; yet the second class resemble the first in this—their work gives them satisfaction, for it is the best they can do or can know. They may be happy in it. The third class can never be happy in their work, for they are always wanting to do something better."

These words were written merely to relieve my mind at the time, and some of the expressions are not such as one would put down deliberately. But there is always value in a red-hot impression, and after two years I find myself not very much altered in my views.

You can look at the matter from two entirely different aspects—from the point of view of the architect himself, or from the point of view of the public welfare. From the latter standpoint what I have called the "little men" (who really are not architects at all) are not far from being a real danger. Their existence justifies the agitation for registration. Yet it is difficult to see how registration would stop the evil. You could stop such men calling themselves architects, but you couldn't stop them drawing plans for willing clients.

But I am more concerned here with the personal aspect of the case. What inducement is there to young men to go into the profession when the chances of their ever getting any real satisfaction from their work are so small? Over and over again I have come across first-rate men doing violence to their natures in order to live. Men with high ideals, who recognise the influence of architecture in public life, and who wish to do their little towards raising the standard of taste, but who will go to their graves never having been allowed to put up a building in any way embodying their own ideas. When you begin to realise this thing, that it is the normal condition of a vast number of architects in this country, the situation of the profession strikes you as heart-breaking, and you feel glad to be outside it. And yet young men flock into these offices as pupils without any heed of the future!

Tragedy and comedy go side by side here as elsewhere. There are many tragedies in architects' offices. Young men with high hopes and aspirations, possessed of real ability, growing old as bald-headed assistants, or drawing plans of warehouses and shop-fronts in an office of their own. These things go on from day to day, whereas the comedies are things of a moment.

So the traveller finds out his ground. Many an office he passes by after the first visit. Many he will call at once or twice a year just to see if the luck has changed. The big offices he often finds doing more in quantity than in quality. And he not infrequently finds first-rate work proceeding from a dirty office up a dirty stair, the staff perhaps consisting of a pupil and an office boy.

If the traveller gets many snubs on the one hand, he also gets many confidences on the other. You must be prepared to talk to a man on his own ground as well as your own, and before this I have found myself discussing the character of James I. and the history of the French Revolution! Some architects will give you their no uncertain opinions of the work of their rivals. When half an hour afterwards, perhaps, you speak with the rival you hear another and quite a different tale. The temptation is to speak to one man of the weaknesses of another. You must, however, lock up all these things in your heart or, what is better, forget them. One architect in a large northern town told me that besides himself there were only two other firms in the same town that could design at all. I did not venture to ask the names of the other two, but I may say that this occurred in a town where the directories would yield a list of something like fifty or sixty architects' names.

Some architects will admiringly show you their own designs, inviting your praises. When you are able to give these honestly, well and good; but often you feel more inclined to criticise and suggest, and then your position is not happy. In fact, the poor traveller must ever be an actor and have no opinions of his own.

Architects will find all manner of excuses to express their inability to do business with you. But I am quite convinced that in the majority of cases the plea of lack of opportunity to do good work is a very legitimate one. Not once, but a score of times, has an architect shown me estimates that have been ruthlessly cut down, thereby doing away with anything but the very necessities of building. No man can have real interest in such work.

Up in the north I was always being met with the reply, "Yes, it is all very beautiful work, but we never get a chance of using it up here. You should go south; all the taste is in the south." Then I go south, and this is what I hear, "Yes, indeed, we should very much like to use such work, but we are too poor in the south; you should go north; all the money is in the north." And the worst of it is that both are right. The money is in the north and the taste is in the south, generally speaking, but it seems impossible that where the one is the other should be also. I have heard the most incredible stories of wealthy north-countrymen, men who will have the best of everything in their cellars, eliminating such items as plate glass from the estimates of their new residences so as to save expense.

The really good work is in the hands of a comparatively small number of men. And this should assuredly give pause to young men before entering the architectural profession as at present constituted. The big offices are not the best in many cases for a youth to pass his pupilage. In the majority of these offices things are managed in such a businesslike way, with so much regard for the division of labour, that a lad is apt to get into a groove from which, without he has a strong determination of his own, he will be unable to escape. These big offices are apt to give one a mental headache; you find yourself wondering what architecture is. Everything is done at high pressure, as in a factory, and you are not surprised when you are told by the architect himself, as I have been, that he could do with a month in gaol so as to be perfectly quiet and so regain his wits.

The President of the Institute in his address to students last February said: "There is nothing so prejudicial to artistic effort as worry. Therefore the architect whose soul is in his art should strive to render himself as impervious as possible to worry."

It is precisely this rush and worry that makes it impossible for so many men to design the fittings of a building themselves, and which has thrown them so much of late into the hands of the manufacturers. So much good work is turned out nowadays by manufacturers that it is no wonder that architects are content to choose from printed catalogues, or from samples, rather than to design anything themselves. In the case of door furniture and similar articles cost makes it almost a necessity in the majority of cases to adopt this course. But there are other things—take an ornamental iron gate or a leaded window, for instance—that have to be made specially to fit certain positions. These have to be designed, and there is no one who should know better than the architect what is wanted. But in more cases than I should like to name the architect does not know what he wants. He asks a manufacturer to send him a design, without, perhaps, being able to give him any real idea of the position or surroundings of the gate or window. He may give an indication of the "style" of the building or a traveller may be allowed to see the working drawings of the building. The traveller has to send on these particulars to his firm, who hand them over to their designer. This gentleman may be a real artist, but how is he to turn out really satisfactory work under such conditions? He is often working completely in the dark, besides which it is almost impossible that he should be in entire sympathy with all the styles that he is expected to design in. Who then is to blame if when the drawing goes to the architect he condemns the designs as unsuitable? Not the designer or the traveller, surely! It is the system which is to blame. It is a bad system, and involves an immense waste of energy and time. The usual course for an architect to adopt is to ask two or more firms to send drawings, and those he likes best or are cheapest he selects. Thus, to save the architect trouble and brains perhaps half a dozen firms are put to enormous expense in keeping drawing

SELJUKIAN ARCHITECTURE: A RUINED MOSQUE IN THE CITY OF SIVAS, ASIA MINOR.

offices with staffs of draughtsmen continually at work.

It is extraordinary to find how few architects have any idea of what they want in matters of this kind. They cannot tell you when you ask them, and they either cannot, or will not, sit down and think the matter out so that all firms can tender for the work on the same basis. No, it is a matter of simply knowing what they do not want; and you may take them a drawing which has taken hours, perhaps days, to produce and be met, not with a simple expression of disapproval, for which you must be prepared, but with an absolute inability on the part of the architect to say why he does not like it, or any capacity on his part to suggest where any amendment can be made.

I daresay manufacturers were quite as much to blame as architects in the first instance in making this system so easy. But I am not writing now from either the point of view of the manufacturer or the architect. I have no immediate interest with either. But there is the larger question of public taste, and it is impossible that the best results can be obtained in our buildings under the present system of architects relying on manufacturers for the designing of certain parts,

An architect is expected to do so much nowadays that he has very few hours of his time to devote to architecture. The profession does not lack in numbers and it does not want for recruits. But the right kind of recruits do not come. There should be room for all who have a natural ability for architecture, which at present there is not—room, I mean, to develop their gifts, not merely to exist. There should be no encouragement for those devoid of any natural ability to enter an architect's office. Parents and guardians should be made to understand that this is not a business that can be picked up in a year's time. The elements that make for success in the architect's profession are very various, and natural ability is only one of them. By itself it can do little. In many cases it lives as a Ghost, and the man who has had the advantages of money and social position goes to the top of the ladder. These things are too well known to need repeating. They are, however, impressed on the mind of a commercial traveller who before he trod the vestibules of so many architects' offices had worked behind the drawing-board in a few.

The Westminster County Court in St. Martin's Lane, W.C., is about to be removed from the site it has occupied almost since the date of the passing of the first County Courts Act. The Office of Works have approached the Westminster City Council with an enquiry as to whether any of the public offices which have come into their possession would be likely to be available. To that the General Purposes Committee have replied that the Westminster Town Hall in Caxton Street will be available after the completion of the alterations to the Town Hall in Charing Cross Road.

RECENT BUILDING IN MANCHESTER.

THOUGH it would be an exaggeration to say that Manchester is being rebuilt, an extraordinary amount of building is certainly going on—much of it of importance so far as size and cost go, much of it almost without any artistic value. In Winter's Buildings, on the east side of St. Ann's Churchyard, good use has been made by the architect of what is on the whole one of the best sites in the city for a building of the kind—shops (it is to be supposed) below and offices over them. Stone has been mainly used for the ground-floor work, and buff terra-cotta with a little red brick filling in the plain wall spaces above. On the west front the shops are treated with a series of arches, one to each shop, so that the superstructure stands upon something apparently able to carry it. On the north the architect would seem to have been prevented from carrying out the same idea, for here we have the aching void, and the great weight carried on nothing obvious, to which we are only too well accustomed. Lofty as the building is, it is somewhat overborne by the Conservative Club. Probably rights of light somewhat limited the height. The architectural treatment is at once dignified and picturesque, and there is a play of architectural form and treatment which avoids monotony and indicates true artistic feeling. Though the terra-cotta is of a uniform colour the tone is pleasant, and the treatment is such as not to beget a desire for more relief in colour than is obtained by the introduction of red brick for the plain wall surfaces. As the shields over the piers on the west are of stone, it is a pity that, if not all somewhat different in design, they were not at least alternated. The chimneys, which rise to a considerable height above the roof, give evidence of careful design. Their detail, however, is not nearly bold enough either for the building or for their own height from the ground. The windows in the roof are not equal in merit to most other parts of this really good design. In this situation the skyline is of specially great importance, but it does not seem to have received as much attention as it deserved.

Often, though not this year, there are to be seen in the Royal Academy excellent models of proposed buildings. By the use of such models, and at the cost at most of a few pounds, grievous blunders may be avoided which thousands of pounds would not wholly put right afterwards. Had such a model been made of the Whitworth Hall of the Owens College the upper part of the twin towers could hardly have been built as it is. This building is so good in general design and in fresh, vigorous, crisp and ingenious detail, that regret for this blemish is rendered all the deeper. Up to the springing of the fine south window the towers promised well. Then it is as if another hand, directed by some unlucky genius, continued the work. The idea of the finial to this gable would probably look better if employed in some other building. Had copper instead of lead been used for the covering of the spires the gain in effect would have been great to begin with; and then copper looks better as years go on. The carving of the arms has in places been given bolder relief. The improvement is so great that the sculptor should be encouraged to continue it.

St. Mary's Hospital, now nearing completion, fulfils its earlier promise as to outline, detail and colour. It exhibits very satisfactory terra-cotta colouring. The three or four dormer gables, south and east, are lumpy and awkward; here, too, a model would have assisted the architect to avoid this defect in a building which presents but few points for adverse criticism—and for some of these (for instance, the mean frontage to the canal) the architect is probably not responsible. Like those in most ancient buildings, the inscriptions and monograms are well designed, so as to say clearly what they have to say and yet to be effective as decorations. In the Technical Institute and Free Library in the Stretford Road the name and title appear in like manner in raised terra-cotta letters in the south front gable, but they are so ineffectively arranged and are in such slight relief that they do not tell their story clearly, and also fall short as a decoration. And yet the architectural merit of this building is not low. The treatment of it on the acute-angled site is so well devised that what may be in some hands a serious drawback here appears as a substantial advantage. The different purposes of the different parts of the building, too, are well expressed, whilst the whole presents due unity and harmony of design. There are some dormer gables of the same sort as at St. Mary's Hospital, but here the proportion is good; they do not seem too heavy or clumsy. This is a building of unrelieved red brick and terra-cotta—very red—and yet so handled as not to be offensively aggressive, words not too severe to be applied to the skeleton letters giving the names of firms and of their trades that disfigure the fronts of so many buildings. Look, for instance, round Albert Square. What an outrage on architecture are all these great ranges of letters which are placed over windows, on cornices, anywhere! Nothing is safe from the advertising demon.

One reason why there is so much building of a kind that makes one sorry for lost opportunities is that an inferior design usually looks much better on paper than in execution, whilst a design of real merit always looks much better in execution than as foreshadowed on paper. Few indeed of those who choose designs or employ architects have the qualifications necessary to enable them to distinguish between one and the other. It not infrequently happens that the inferior design, if the colour is laid on thickly or the lines made bold and telling, is preferred owing to the inexpertness of those who decide.

When we have our long-talked-of Chair of Architecture at the Owens College to instruct the public as well as architects we may do better all round. Not seldom the so-called architect provides little more than "the connection" and the money for conducting a practice. "Ghosts" are no more unknown in architecture than they are in literature or painting or sculpture; and thus the character of the work of a firm, instead of expressing the mind of the nominal architect, is apt to show from time to time sudden and violent changes, according to the "ghost" that may happen to be raised at the time.

Messrs. Goodall's great place in King Street is on the whole an effective building, and is obviously the work of a man who has knowledge and power behind his pencil. There is, however, the defect of the aching void—the heavy building "standing upon nothing." Nor can one help feeling that the special type of design here used is not the one most perfectly adapted to the special purpose, and that a severely plain building would have set off the furniture exhibited for sale better than this very pretty one.—(From the "Manchester Guardian.")

A Statue to General Dumas has just been finished, and will be erected in Place Malesherbes, Paris. The sculptor is Alphonse Moncel.

UNION STREET, ABERDEEN.

THE GRANITE CITY.

THE picturesqueness of the northern capital of Scotland, if the term may be used without offending the susceptibilities of Inverness, is second only to that of Edinburgh in this, that it affords several extremely interesting street vistas, the buildings of Aberdeen being various in form but singularly alike in their material. The accompanying photographs show the two best aspects of the city as seen from the central spot, which is undoubtedly the Palace Hotel of the Great North of Scotland Railway. Looking west, the thoroughfare known as Union Terrace is seen flanked on the right by the gardens, with the railway to the north in a deep cutting, and in the distance Schoolhill Bridge and various public buildings, among which the Library stands out prominently. Looking south from the angle of the hotel, Union Street, slightly rising away from the spectator, is a straight and solid street of buildings, best seen when the sun shines strongly upon the grey granite, but always pleasing, except perhaps on the winter mornings when powdered snow is driven along before a keen north wind, and then the prospect is bleak and depressing enough; but there is still evident the strong harmony between nature and the granite worked into architectural forms which must always strike the visitor. Our third illustration is taken from the top of the hotel, from which lofty vantage the whole city may be seen spread out at one's feet. The photographs were taken by Mr. F. J. Pape.

UNION TERRACE, ABERDEEN, FROM THE ROOF OF THE PALACE HOTEL.

Till 1800 Aberdeen had steep, narrow and crooked streets, but since the Improvement Act of that year the whole aspect of the place has been altered by the formation of Union Street (nearly a mile long and 70ft. wide) and King Street, and by the subsequent laying-out of many others, besides squares, terraces, &c. The city is built on sand, gravel and boulder clay, and the highest parts are from 90ft. to 170ft. above sea-level.

The chief building in Aberdeen is Marischal College or University Buildings, which stands on the site of a pre-Reformation Franciscan convent and was rebuilt during 1836 and 1841 at a cost of about £30,000. It forms three sides of a court which is 117ft. by 105ft. and has a tower 100ft. high.

STAINED-GLASS WINDOWS.

THE PROCESS OF MANUFACTURE.

WE take the liberty of reprinting the following article from the "Globe":—

Although everyone is familiar with stained-glass windows, the production of which is an art as old as ecclesiastical architecture itself, it is surprising how very few persons are acquainted with the process involved in the making of a stained-, or, to be more correct, a coloured-glass window. They look at a church window, note the figures, maybe of saints, depicted thereon, but rarely do they stop to enquire by what methods, either of the artist or the craftsman, this design in coloured glass has been effected. A brief account of the manufacture of a window may not, then, be lacking in interest, more particularly as few churches of any note fail to boast some examples, of very varying merit it is true, of the coloured-glass window.

Burne-Jones and William Morris.

In comparatively recent times a successful effort has been made to break away from the inartistic traditions which had grown up around this form of ecclesiastical decoration, and to revert to what is claimed to be the ancient, as it is certainly the better, practice of intimately associating the artist and the craftsman in the production of stained-glass windows. It is to the system of work as exemplified by the Burne-Jones and William Morris school that the following remarks particularly apply. As we have indicated, the window is more properly described as one of coloured glass, for it is on such glass that the artist paints—in monochrome it is true—his design, and the staining of the glass, if resorted to at all, plays but a very insignificant part in the decorative scheme.

The Most Important Part.

Perhaps one may be excused for describing the leading as the most important part of a stained-glass window, for the very good reason that without the leading it would be necessary to paint a window in one piece. It is the lead which renders it possible to make up a composition of any number of pieces of coloured glass, and thus gives the artist an almost unlimited range—there are certain reservations which need not be discussed here—in the production of his work of colour and design.

It is the lead, then, which gives strength to the picture both structurally and artistically; but in tracing a stained-glass window from its inception it should be stated that the artist first makes a small colour sketch to scale, and from this he produces a cartoon in black and white of the exact size of the window space to be filled. Here the contention that a knowledge of the craftsman side of the work helps so much in the production of appropriate design may be appreciated when it is stated that the cartoon is now given over to the workman, who produces what is called a "cut line" or tracing cloth; that is, he makes a tracing of the principal lines of the artist's picture, showing how the glass is to be cut to meet the needs of the colour scheme.

Glass.

Next it is the turn of the master glass-cutter, who, in association with the artist, chooses the glass to be used in reproducing his picture, and when the choice has been made—a by no means unimportant business, as can be well imagined considering the prominent part played by the coloured glass—the glazier's skill is brought to bear in cutting the glass according to the indications given by the tracing. Naturally the widest possible scope is offered in the choosing of the glass, and the firms engaged in the production of the material for windows are untiring in their efforts to produce the finest possible colours, from the most expensive form, that of gold-pink, down to the "sheet antique," as it is known. When a particularly fine colour is obtained the secret is carefully kept, and here again the artist and the craftsman work hand in hand in the attempt to produce the best possible result.

The glazier having completed his work, the pieces are put together in form on a sheet of plate glass placed over the cut line or tracing. Any portion of the coloured glass which has showing through it a principal part of the design, such as a head, a hand or a piece of drapery, has traced on it so much of the artist's work in the pigment—brown being the colour, made up of black, red and umber. The pieces of glass are so placed as to show between them the black lines of the tracing—the outlines of the figures, &c., and every part where different colours are to be arranged in juxtaposition—and it is where the black lines are revealed that the lead subsequently assumes its appointed position. Thus disposed in perfect scheme so far as colour is concerned, the "stained glass" is waxed into position on the slab of plate glass and then lifted on to an easel, where the task of painting is completed with all the care the artist can bestow on his work.

Sir Joshua's Windows.

It should be borne in mind that the painting is carried out solely in the monochrome already mentioned, and that it is the coloured glass showing through the brown pigment which produces such wonderful, and of course almost imperishable, effects. It was Sir Joshua Reynolds, if we remember rightly, who thought that brown pigment, tracing out the design over white glass, would alone suffice, and what result he obtained may be seen in a window in New College. It has been mentioned that coloured and not stained glass is the correct term to apply to the principal medium of "stained-glass" windows, and here it may be said that practically the only staining resorted to is in the production of gold colour. This is rendered possible by silver staining of white glass, a pretty effect very common nowadays in house decoration. It is really opalescent, but against the light a fine golden colour is shown.

With all the discoveries of modern times it is worth noting what little change has taken place in the production of coloured glass in this country, for the very good reason that the material to hand meets all possible requirements of the artist and the craftsman anxious to maintain the traditions of this beautiful form of ecclesiastical adornment. America has its own form of glass; and there is the Tiffany glass, with its wavy folds, which certainly renders possible certain effects otherwise unobtainable.

When the artist has finished his painting on the easel the pieces of glass are again separated and are fired in a kiln, being placed therein on iron trays. Heat having done its part in burning the pigment picture on to the glass the whole thing is waxed up again and retouching is resorted to, if necessary, with of course, in that event, refining. Finally comes the glazing with what are termed culms of lead—long strips, grooved on both sides, to carry the glass. All the joins are soldered, and when the window is placed in position iron bars from three-quarters to an inch in thickness are forced on to the mullion to support the picture, wire being soldered on to the lead, which holds all the portions of the colour scheme in position, and bound round the transversing iron. This, then, put in plain language, is the process involved in the production of a stained-glass window, such as the splendid "Jonah" window of Burne-Jones in Christ Church College Chapel, Oxford, the examples of the art of Mr. Lewis Davy in Stoke Pogis Church, or those which Mr. Christopher Wall is engaged upon in the lady chapel of Gloucester Cathedral. It is not in London that one expects to find the best examples of modern work, but mention may be made of the window of saints by Burne-Jones at Holy Trinity, Sloane Square, and of the work of Ford Madox Brown in the Chapel Royal, Savoy.

CARDIFF'S NEW MUSEUM.

THE site allocated by the corporation in Cathays Park, Cardiff, for the new National Museum of Wales consists of two acres lying between the new Town Hall and Park Place, so that the south facade of the new buildings will be in line with those of the Town Hall and the law courts.

The general plan of the proposed buildings was the subject of long consideration, and in the end the choice fell upon the so-called "gridiron" form, of which the British Museum of Natural History is a good example. The south range will form the chief front, and will contain the entrance-hall and main staircase, while stretching behind it will be a series of galleries crossing the space like the bars of a gridiron and ending in a north range. The art galleries will form the west front, while along the east will be certain semi-detached buildings, such as a lecture theatre, administrative rooms and porter's lodge.

A striking feature of the scheme will be the means adopted to accommodate the spaces to the collections. As the collections grow at irregular rates, it is impossible to anticipate the spaces they will require in even a few years. The result is that in most museums some rooms are under-filled and others are crowded. The remedy proposed is to avoid permanent rooms, and instead to divide the long galleries, which the "gridiron" form admirably supplies, into sections, which can be varied in length by movable wooden screens. These screens would each have a central arch, over which would be placed the designation of the section it opens into—Geology, Prehistoric, &c.—and would be so constructed as to allow them to be removed to another position with little trouble. It is not proposed, however, to apply the system to the art galleries and the natural history index-hall, as the requirements of their collections differ considerably from those of the ordinary galleries. Stone is the material proposed to be used, in order that the exterior should harmonise with the new Town Hall.

In addition to the £6,000 generously promised by the executors of the late Mr. J. Pyke Thompson, J.P., it is proposed to raise a loan of £14,000 on the security of the museum rate, and repayable in thirty years. Money for building purposes must come from somewhere, but the total of £20,000 is far from being sufficient. The new Victoria Art Gallery of Bath has cost £16,000, but it is obvious that for the combined purposes of museum and art gallery at Cardiff a building three times its size will be required. Bristol contemplates expending about £30,000 on an extension merely of the existing museum. £15,000 is the estimated cost of the first portions to be erected of the proposed museum and art gallery of Plymouth—a town half the size of Cardiff. At Preston the library and art gallery cost over £100,000, representing, say, £50,000 for the latter. The new Kelvingrove Gallery at Glasgow has already absorbed a quarter of a million. Yet these towns have only aspirations on a municipal plane, whereas Cardiff is looking for its recognition as the capital of a nation, and for its museum and art gallery to become a national institution. Will Cardiff sit down content with a second-rate municipal museum?

ABERDEEN FROM THE ROOF OF THE PALACE HOTEL.

AN EXPERIMENT IN HOUSING.

THE DUKE OF NORTHUMBERLAND'S experiment in working men's dwellings at Alnwick is made much clearer by a memorandum which, with the permission of the Duke, has been written for the Charity Organisation Society. It is by Mr. E. G. Wheler, who has been prominently connected with the movement from its start. It is one of the features of the system that it is based on sound commercial principles. Efforts of any other kind, however well intended, must be spasmodic and local, and therefore cannot be looked upon as a solution of the question. Mr. Wheler points out that one of the chief difficulties to be contended with is the present high price of labour. To this he adds the unfortunate standard of morality adopted by the men's unions that, no matter what wages are paid, the output of work must be restricted. By this means the present scarcity of labour becomes an additional and to a great extent unnecessary obstruction to the betterment of the condition of the men themselves. The Duke of Northumberland stipulated in connection with his scheme that the houses should be inhabited by bonâ-fide working men and women, who might at their option purchase their houses by instalments. As the financial basis of his scheme his Grace adopted the Government rate of interest for the repayment of public loans at 3 per cent. interest in thirty years, viz., £5 2s. 0½d. per cent. It was his special object that the scheme should be financially sound, and that philanthropy should go no further than providing the capital required and the voluntary services of an honorary committee who kindly undertook to give effect to his proposals. For his assistance the Duke appointed a committee, which has strictly maintained the economy of the working of the scheme. Among the members are a bank manager, who acts as treasurer, the clerk of the works at Alnwick Castle, who supervises and advises on all matters of construction and repairs, and a working man well acquainted with the views and wants of those for whom the houses are erected. No one is paid excepting the salaried manager and the collector of rents. A piece of flat land containing 5,820 sq. yds., and sufficient for the erection of thirty-one houses with the necessary out-offices, yards and streets, was placed at the disposal of the committee at the price of 2s. a yd., or £484 an acre. This price was considerably below its market value. The land was within five minutes' walk of Alnwick railway station, and therefore well in the centre of a town of 7,000 inhabitants.

It was proposed by his Grace to lay out the main streets in gardens with a footpath down the centre. This, however, could not be agreed to by the town authorities, as it was contrary to their by-laws. Had this plan been adopted, it is estimated that some saving would have been effected in the cost of each house, and that, whilst the same air-space would have been secured, a much prettier effect would have been produced as regards the appearance of the houses. As already indicated, the occupier can purchase his house in thirty years. In the case of the houses of which the purchase-money is £360 each the quarterly instalment is £3. It is specially provided that at the end of any year the occupier may purchase his house by the payment of a lump sum, and a full table of such payments due at the end of any one of the thirty years is placed on the back of the contract for sale. In the case of the houses valued at £345 each the quarterly instalment is £2 17s. 6d,

Engineering Notes.

The Primitive Methodist Church and Schools, Gloucester, are being ventilated by means of Shorland's patent exhaust roof ventilators and special inlet tubes, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Mr. John Colville, M.P., died last week at Motherwell from a severe attack of British cholera. Mr. Colville was born in Glasgow in 1852, and was educated at Hamilton and Gartsherrie Academies. He was an iron and steel manufacturer in business at Motherwell, where he was head of the firm of David Colville & Co.

A New Scottish Harbour.—The Lords Commissioners of the Treasury have agreed to grant £15,000 towards the sum required for the construction of a harbour at Craigenroan. The scheme entails the incorporation of Portessie and district by the burgh of Buckie. The estimated figures submitted embrace a total cost of £45,000, of which sum £10,000 is in hand, exclusive of the Treasury grant. A public meeting of the inhabitants will probably be held to deal with the scheme.

"Electrifying" the Underground.—Mr. Perks, M.P., who has succeeded Mr. J. Staats Forbes as the chairman of the Metropolitan District Railway Co., has stated in an interview with a representative of the Press that the change from steam to electrical traction is progressing steadily, and will be completed in about two years' time. He does not agree with Mr. Forbes that Mr. Yerkes will be satisfied that the Ganz system is preferable to the ordinary system used on the great American lines and on the Central London. It will of course be the duty of the tribunal appointed under the recent District Act to advise the Board of Trade which system is more suitable in the interests of the public, and having regard to the safety of passengers and employées. Mr. Yerkes, it is added, will give orders as far as possible for railway stock to British makers, if their prices compare favourably with those of the American makers and they can turn out the material in as short a time.

A New Bridge over the Swale.—According to information from Sittingbourne, the South Eastern and Chatham Railway Co. have made fresh proposals in reference to a new bridge over the Swale. They stated that they would undertake to go to Parliament next session with a proposal for a swing-bridge, provided among other things that the conservators would agree not to require any alteration in their existing powers as regards the opening of the bridge only for vessels that could not lower their masts. The conservators replied that they could not consent unless the bridge was to be opened to all vessels, whether having fixed masts or not. The company having demurred to this, the Milton Creek Conservators have, it is said, decided to commence an action to secure the opening of the existing bridge, which has been closed to vessels with fixed masts for the past two years. The Admiralty also, it is understood, think that the bridge should be restored as an opening one, both in the interests of H.M. Navy and in respect of ordinary commercial traffic.

Memorial to the late Peter von Tunner.—It has been decided to erect in Leoben, Austria, a statue of Peter Ritter von Tunner, Bessemer Gold Medallist of the Iron and Steel Institute, to commemorate his great services to the Metallurgy of Iron. An influential committee has been formed, with Mr. Ignaz Prandstetter (Leoben) as president, Professor J. G. von Ehrenwerth (Leoben) as vice-president, and Professor Carl Fritz (Leoben) as hon. secretary, to collect subscriptions. The committee includes the following members of the Iron and Steel Institute: R. Akerman (Stockholm), Bessemer Medallist; Sir Lowthian Bell, Bart. (Middlesbrough), past-president and Bessemer Medallist; A. Greiner (Seraing), member of council; Professor H. M. Howe (New York), Bessemer Medallist; C. Lueg (Düsseldorf), president of the society of German Ironmasters; Josef Massenez (Wiesbaden); E. Schrödter (Düsseldorf), and Professor H. Wedding (Berlin), Bessemer Medallist. At a recent meeting of council of the Iron and Steel Institute the matter was considered. As a contribution to the memorial could not be voted from the funds of the Institute, the members of council present decided to contribute two guineas each; and Mr. Bennett H. Brough, the secretary, now informs us that he has forwarded to the committee in Leoben contributions of that amount from Mr. William Whitwell (president), Sir David Dale, Bart., Sir Lowthian Bell, Bart., The Right Hon. Sir Bernhard Samuelson, Bart., Sir James Kitson, Bart, Sir Frederick Abel, Bart., Sir Benjamin Hingley, Bart, Mr. R. A. Hadfield, Mr. J. T. Smith, Mr. A. T. Tannett-Walker, Mr. J. E. Stead, Mr. William Evans, Mr. J. D. Ellis, Mr. Arthur Cooper, Mr. Arthur Keen, Mr. George Ainsworth, Mr. F. W. Webb, Mr. E. P. Martin, Mr. P. C. Gilchrist, Mr. Andrew Carnegie, Mr. William Beardmore, Mr. S. R. Platt, Mr. J. M. While, Mr. W. H. Bleckly, Mr. James Riley and Mr. David Evans. Peter von Tunner died on June 8th, 1897, and particulars of his career are given in an obituary notice published in the Journal of the Iron and Steel Institute, 1897, No. 1, page 314.

Builders' Notes.

Welbeck Abbey.—The contract for rebuilding the Oxford wing of Welbeck Abbey, which was destroyed by fire, has been let to Messrs. Trollope & Co., London. About 250 men will be employed for two years.

The Leeds Master Builders' Association held its annual meeting last week when Mr. John Pickard was elected president for the ensuing year; Mr. G. Wilson, vice-president; Mr. W. C. Ellisdon, secretary; and Messrs. J. T. Wright, W. H. Dews, W. Airey, C. Myers, W. Simpkiss, W. Oakes and G. W. Nettleton, committee.

Partnership Dissolved.—The partnership heretofore subsisting between Messrs. Samuel Mason & Arthur Waddington, carrying on business as builders and contractors at Glass Houghton and Castleford, York, under the style or firm of Mason & Waddington, has been dissolved by mutual consent as and from the 13th August, 1901. All debts due to and owing by the late firm will be received and paid by Mr. Samuel Mason.

Mr. James Cowle, builder of Douglas, died last Wednesday at the age of sixty-two years. He was in a large way of business, and held the positions of Government valuer, surveyor of ecclesiastical buildings, and surveyor of Government buildings. Many public buildings in the island were designed and erected by him, these including the Tynwald Court Chamber at Douglas, the Poor Asylum, the Rolls Office, and the Douglas Railway Station. The deceased was a native of Liverpool.

Fire at Builders' Workshops.—A serious outbreak of fire occurred last Friday morning at the extensive premises of Messrs. Holloway Bros., builders and contractors, Garfield Road, New Wandsworth. The premises first attacked were partly surrounded by a wall about 7ft. high, beyond which were private residences. The flames quickly cleared the slight obstacle, and set the upper part of the roofs of the houses on fire. Water was pumped on to the houses, and the flames extinguished, but the houses were much damaged by fire and water. The fire was at length got under. A range of buildings of one and two floors, covering an area of 140ft. and 100ft., used as saw-mills, workshops, offices and stores, was completely burned out, and the stock of timber in the yards was severely damaged. In addition, several houses have been partially destroyed. The loss as regards Messrs. Holloway is covered by insurance.

Building Extensions in North Cornwall.—In the development of North Cornwall as a resort for tourists, Port Gaverne, at present but little known, bids fair sooner or later to come into enviable prominence. Already by the rapid erection of good class houses in almost unbroken succession on the connecting road, it has stretched westwards on to Port Isaac. And now schemes are afloat for its expansion in an easterly direction by the fine cliffs overlooking Tintagel, and southwards on each side of the snug and beautiful valley ending at Pendoggett. The estate agents of Viscount Ebrington, who owns a large quantity of land in and around Port Gaverne, have marked out a considerable amount of the ground for building enterprise. The water supply from the high lands of Treore (one of the Viscount's estates a mile or so distant) promises to be all-sufficient; and the construction of the reservoir with the laying of the pipes is being pushed on. An analysis of the water has proved it to be excellent.

Rebuilding of Parkhurst Barracks.—The third contract in connection with the rebuilding of the Albany Barracks, Parkhurst, has just been accepted, Mr. H. I. Sanders, Government contractor, of Southampton, who has carried out many contracts in the island, being the successful tenderer. The work included in the new contract comprises the erection of commanding officer's residence, officers' quarters, quarter-master-sergeant's quarters and drill sheds, and these buildings will occupy the space now being cleared, between the highway and the new buildings nearing completion, on the guard-room side of the main entrance to the barracks. The commanding officer's residence will front the highway, and then will come the officers' quarters and other buildings; and the new buildings, of modern style, will be in striking contrast to the old rabbet tiled hutches which they will supplant. Even after the completion of this contract the central range of the old-fashioned barrack buildings will remain to be removed. The amount of this contract is nearly £20,000. Messrs. Armitage & Hodgson have nearly completed their work under the last contract. In addition to four large barrack blocks, corresponding to those on the upper part of the parade ground, they have erected a school and a considerable amount of shedding, &c.

Coins under Memorial Stones: Singular Thefts.—Details of two robberies surrounded by somewhat singular circumstances have just come to light in Bury. Amongst the schemes which the Bury Corporation have on hand at the present time is the erection of public abattoirs on the fair ground and of fever isolation hospitals at Elton, and the contractor for both sets of buildings is Mr. John Tinline. Recently memorial stones were laid in connection with the administrative block and the scarlet fever pavilion of the isolation hospital and in cavities underneath the stones there were placed bottles containing various documents and a number of coins of the realm. When work was resumed at the hospitals after the recent Bury holidays it was found that nearly all the bricks behind the memorial stone of the administrative block had been knocked away and the bottle abstracted and rifled of its contents. The papers were strewn about, but the money had been taken away. The memorial stone of the scarlet fever pavilion was not supported by bricks at the back, but was firmly cemented in position. The depredator or depredators, however, by using an iron crowbar removed the stone from its position and treated the contents of the bottle underneath in the same way as he or they had treated the other. About the same time the contractor's office and the clerk of the work's office in connection with the abattoirs were broken into, but nothing of value was taken away. Both affairs are now being investigated by the police.

Bricks and Mortar.

APHORISM FOR THE WEEK.

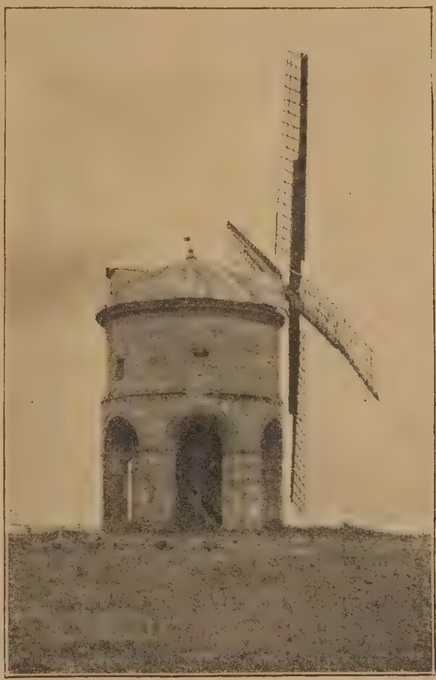
Better the rudest work that tells a story or records a fact, than the richest without meaning.—RUSKIN : "Lamp of Memory."

Our Plates. PARTICULARS of Magdalen College School, Wainfleet, Lincolnshire, will be found on page 31 of this issue.—Vienna proper, or the inner city, was formerly separated from the other districts by a circle of fortifications, consisting of a rampart, fosse and glacis. These were removed in 1858-60 and the place of the glacis has been taken by the Ring-Strasse, a handsome boulevard two miles long and of an average width of 150ft. Most of the important new buildings are found in or adjoining the Ring-Strasse, amongst them being the monument to the Empress Maria Thérésa and the imperial museums of art and natural history, two extensive Renaissance edifices designed by Semper, and matching one another in every particular. Adjoining the museums to the west are the Palace of Justice (1851) and the Houses of Parliament (1883), and beyond these the immense new Rathhaus (1873-83), the last designed by Friedrich Schmidt, who may be described as the chief exponent of Gothic as Hansen and Semper are the leaders of Classic and Renaissance architecture in that country.

Dr. Stein's Discoveries in India. WITH a view of conducting excavations which would settle the date and the origin of the ruins found buried in the sands of the Taklamakan Desert about Khotan, and the doubts as to the scripts which had been obtained there, Dr. M. A. Stein, of the Indian Education Service, applied in 1898 to the Indian Government for assistance towards exploring these sites. That Government readily agreeing to Dr. Stein's proposal, placed him on a year's special duty. In June, 1900, he set out. Weeks were spent in preliminary work, Dr. Stein employing his time in surveying the mountain range south of Khotan. Winter put an end to the work in the mountains, and he then turned his attention to the ancient sites and excavated a large series of Buddhist temples about ten miles to the north-east of Khotan. The finds comprised ancient manuscript in Sanskrit, Chinese and an unknown language, the last, however, being written in well-known Indian characters; Buddhist pictures on wooden boards, and stucco sculptures of Indian style. The site is known as Dandan-Vilik. From there Dr. Stein went to the Keryia district, where rich results attended the excavations. Amongst ruined dwellings was an abundant supply of epigraphical and other relics, and 500 documents written on wooden tablets in the Kharosthi script. Some of the latter bear the clay seal originally attached to them, and these show unmistakable traces of Greek art. After completing his excavations Dr. Stein marched back to Kashgar and arranged for the transport of the collection to England. The Doctor has now found a safe resting-place for his antiquities in the British Museum, where he is arranging them.

Chesterton Windmill, Warwickshire. FEW architects of the present day have the opportunity to design a windmill, and what the genius of Inigo Jones has erected comes as a very interesting architectural curiosity. Chesterton windmill is between six and seven miles from Warwick, east of the main Banbury road, and stands out prominently on its grassy hill. It bears the date 1632, and was erected at the expense of Sir Edward Peyto on the site of an earlier structure. Built of ashlar and circular in shape, the body is supported by six square circular-headed pillars with pilaster caps, the ascent to the interior being made by a wooden latter underneath. The domed roof is lead-covered, and revolves to suit the fliers' direction, according to the way of the wind; there are several windows in the upper half and one dormer in the roof. This windmill is said to have served as a model for one erected at Rhode Island in 1676. The remains of a Roman camp lie half a mile west, where Roman coins and pottery have been discovered. A magnificent prospect of "leafy Warwickshire" is obtained from the windmill—the castle at Warwick and tower of St. Mary's Church, the spires of Coventry, and on a clear day the suburbs of smoky Birmingham. This mill was worked until recently; a good view of it is seen from the Great Western railway soon after passing Harbury station. The accompanying photograph was taken by Mr. C. M. C. Armstrong.

A Discovery near Savernake Forest. A DISCOVERY of flint implements of much interest has lately been made on the estate of the Marquis of Ailesbury at Knowle Farm, on the borders of Savernake Forest. A gravel pit was opened a short time ago close to the farm buildings, and the implements have been found in this at various depths below the surface of the ground, some embedded in coarse gravel and silt, and others in dark red clay, and at a depth in some instances of 8ft. to 10ft. from the surface. The ground is at least 450ft. above sea-level, and it would seem that at the particular place where the gravel occurs two or three streams must have met which had had their courses through the forest and were making their way to the valley of the Kennet, some three or four miles to the south-east. There is now no stream of water in any part of the forest, and besides this there is nothing to indicate in the present configuration of the ground the source from whence the water by means of which the valleys were eroded could have come. It is only by imagining an entirely different face to the country (such as might have been if the valleys had been eroded before the formation of the Pewsey Valley, some three to four miles to the south-west) that we can conceive an origin for the streams in these forest valleys. Between 200 and 300 implements have already been found, many of them of beautiful workmanship, while others are very rude and apparently unfinished. Whether these latter belong to the earlier "Eolithic" period and have been washed out of their earlier beds of gravel and deposited with implements of a later date (as appears to have taken place on the plateaux in Kent) is a point to be decided hereafter; but it is very difficult to imagine these rude implements to have been manufactured by the same race of people as have made and finished with so much care those apparently lying by their side. Most of the implements are of very superior flint, extremely hard in texture; one or two may be of chert, and one appears to be of "Sarsen" stone, and they bear a marked similitude to those found at St. Acheul in the valley of the Somme. Some are very finely polished, as if from the constant rubbing of blown sand, and have an appearance as if coated with glass. They are of all sizes and shapes, some of 5in. to 6in. long, generally of a rough unfinished type; others 3in. to 4in. long, of the common spear-shaped form; others of the well-known ovoid form; and others pointed as if to be used as drills. One or two Palæolithic implements have been previously found in the locality; but the occurrence of them in such large numbers as these at Knowle is quite new to the district. No other remains have as yet been found; but considerable interest attaches to the working of these gravel pits, which will probably remain open for some time.



WINDMILL AT CHESTERTON, WARWICKSHIRE. INIGO JONES, ARCHITECT.

Extending a Building Line. A CASE recently arose which forms a typical example of the great need there is for local authorities to be given the power of supervision of the design of buildings and over advertisements in order to prevent the depreciation, wilful or otherwise, of neighbouring property. A petition signed by several residents in Upper Teddington Road, Hampton Wick, was recently received by the district council in respect of new buildings in course of erection on the other side of the road, the memorialists calling attention to the fact that when they last addressed the council on the subject there was some tacit understanding that the former frontage line of the buildings opposite their properties would be kept, but they found that the frontage line had now been infringed and that the houses being built were much nearer the road. They were of opinion that if the council passed the plans they ought to have had proper notice of it, so that they might have been heard on the subject and opposed it if necessary. In addition they found that the fence opposite them was plastered with advertisements and the space between the houses and the road was kept for storing timber, &c., which was a great annoyance to them and a great detriment to the value of the property in the neighbourhood. They therefore asked the council's assistance to have the advertisements removed, and that the council would give them notice if any further buildings were to be erected. The committee recommended the clerk be instructed to reply, pointing out that the council had secured after a great deal of trouble a frontage line of from 12ft. to 20ft., which was the utmost the law allowed. As regards the advertising and timber being stored, the council had no power to interfere, but had directed the clerk to communicate with the owners of the property asking them to discontinue the use of the fence for advertising purposes. As to the passage at the rear of the houses the committee advised the clerk to communicate with the owner of the premises and request that the passages be closed as not being in compliance with the by-laws. It was also stated that the council went out of their way to prevent the erection of the buildings spoken of, and they tried to get the building line kept to 40 feet, but found they had no power to enforce that. The recommendations of the committee were adopted.

New York and London. MISS ELIZABETH L. BANKS in "Cassell's Magazine" draws some points of similarity and difference between London and New York. There are probably, she says, no two cities in the world which are at the same time so like and so unlike as are New York and London. Regarding the points of similarity, the writer couples Wall Street with Lombard Street, Park Row with Fleet Street, the City Hall with the Mansion House, and so on. It will, however, be noticed that the imagination to move in this direction must be strongly encouraged by the similarity of the business carried on in these particular quarters of London and New York. Although Wall Street of New York is compared with Lombard Street, it is perhaps only in its architectural character that the similarity is observable, for as a business comparison Threadneedle Street would certainly take precedence. The Fleet Street of New York is Park Row, or Newspaper Row. From an architectural point of view the comparison is entirely misleading, but from the fact that the business carried on in both thoroughfares is the same, the likeness is easily established. The knowledge that the Mayor of New York works at the City Hall would naturally recall the Mansion House to the Londoner. As an interesting fact, it is noted that business in New York commences at a much earlier hour in the morning than in London.

Persian Carpets. The British Consul at Azerbaijan, in Turkey, says it is a most interesting sight at that town to see the carpet looms at work. Eight or nine boys, whose ages range from eight to twelve, sit in serried rows at the looms, and armed with the wool, which they pull from reels suspended above them in their left hands, and a flat knife, crooked at the point, in their right, dash, with three movements, the thread through the web-strings, hook it into the desired knot, and cut off the surplus ends, starting another knot before the spectator has realised what has been done. Having been shown the design and colouringof the carpet they are to work for the first two or three feet, these boys rely on their memories for the remainder of their task, for on only two or three looms is the design of the carpet to be seen affixed, and then only its plain pencilled drawing. When nearing complicated parts or medallions, a boy aged from twelve to fourteen, the foreman of the loom, who has the design seemingly imprinted in his mind, walks up and down calling out in a quaint sing-song manner the number of stitches and the colours of the thread to be used. A copy of the famous carpet from the Mosque of Ardabil, which is now at the South Kensington Museum, is being made by one firm. The design, flowering and colouring of the original are said to be unique, and here, although the boys were working without the design and at the rate of from 30 to 35 stitches a minute, a careful comparison of the hand-painted copy of the original showed the most minute attention in every detail. Nothing but hand-work is employed in the manufacture of Persian carpets and rugs, and none but natural or vegetable dyes are used, and it is to this latter fact that Persian carpets and rugs are supposed to owe their reputation and lasting colours, although it is said that the secret of the beautiful dark blue dye used in the older days has been lost.

Bad Public Taste. The "Morning Post" recently published the following clear and true statement with regard to the bad taste so general among the English public :—"Despite the fact that we in England are now paying great attention to art education, artistic taste is spreading at an astonishingly slow rate. The great mass of the people does not yet believe in the humanising influence of art, nor in its compatibility with comfort. The general public's idea of art is something garish or clumsy or gimcrack. The rooms are packed with articles of infinite variety ; there is no repose, everything tries to get in front of its neighbour ; there is no harmony, neither in colour nor in form. Space, freedom to move about a room, has no charm for most folks. They do not feel the beauty of artistic simplicity. With them there is no compromise between utility and beauty. And this lack of taste is unfortunately spreading to the country districts, where in days gone by one generally found a sense of order inside most houses, a simple scheme of decoration, furniture at once comfortable and charming to the eye. For instance, in one of the oldest and most picturesque villages in Buckinghamshire there is an old inn recently furnished with as garish and ugly furniture as Tottenham Court Road ever produced. Coming from the artistic breadth of the village green and the quaint simplicity of the cottages, those chairs, sofas, &c., have other than a pleasant effect on the nerves."

"L'Art Nouveau" Again. It has been the endeavour of several persons recently to foist the responsibility of starting the "art nouveau" movement on to the promoters of the "arts and crafts" movement, chief of whom have been Mr. William Morris and Mr. Walter Crane. A correspondent of the "Times" comes to the defence. He says : "We need not dim the reputation of these artists by ascribing the 'art nouveau' to them even remotely. It is the result of the example of a very different kind of artist. Those who went to see the Japanese troupe lately performing in London will remember that fully half the popularity of the entertainment was due to the dancing of Loie Fuller. This artist has for years been more widely known on the Continent than in this country. It is to the Continent undoubtedly that we owe the 'art nouveau,' and the idea sprang from the forms produced by the gyrations which Loie Fuller imparts to her garments as she twirls them in the lime-light. Anyone can verify the connection between the 'art noveau' of the Louie Fuller performance by going to see them. The Victoria Museum possesses ample specimens of the hitherto recognised styles of art, 'Jacobean,' 'Louis XIV.,' 'XV.,' and 'XVI.,' &c. I think that those who have some taste in art will feel that it was quite unnecessary to add specimens of the 'Loie Fuller style.' "

New Patents.

These patents are open to opposition until September 31st.

1900. — Timber Transporter. — 14,594. E. J. Cullis, 2, Midland Road, Gloucester, and A. Cullis, Woodville, Belgrave Road, Gloucester. The timber is placed by hand on inclined dogged chains, by which it is raised to an overhead platform, where its direction may be changed as desired. Delivery is effected at any point by switching the timber on to other dogged chains, or on to slides or rolls.

Door Stops.—14,820. F. J. J. Gibbons, St. John's Works, Church Lane, Wolverhampton. The object of this invention is to produce an adjustable dust-proof doorstop. It consists of a circular metal box (which is let into the floor or ceiling) having a screw-threaded sleeve which holds in place a dome-shaped stop pressed outwards by a spiral spring. The extent to which the stop projects can be varied by screwing the sleeve.

Glass Waste Bricks. — 17,120. W. W. Pilkington, The Hazles, Prescot, and W. R. Ormandy, 142, Windleshaw Road, St. Helens. Bricks for low temperatures such as flue linings are made of 80–90 parts of waste glassworks sand, 20-10 parts of common field sand, and 5 parts of alkaline silicate solution. Where waste glassworks sand cannot be obtained coarse-ground and finely-ground refractory rock is used. For use with the bricks a cement is employed having practically the same composition. The bricks are pressed and burnt.

The following specifications were published on Saturday last, and are open to opposition until October 8th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900. — 10,093, Meldrum & Meldrum Brothers, Ltd., destructor furnaces. 11,666, Fischer, instrument for setting-out circular curves. 13,602, Schudt, plastic decorations. 13,640, Denny, pantographic apparatus for producing copies of sculptures, carvings, &c. 13,711, Marten, refuse destructors. 13,923, Charlton, heat radiators. 14,083, Wilkinson, brick- and tile-making machines. 14,341, McCaul, cowls for chimneys. 14,847, Turner, fireproof flooring and roofing. 15,932, Mouchel, concrete piles. 15,966, Kowalsky, apparatus for testing gas-pipes. 16,330, Moseley, warming and ventilating apparatus for use with stoves, fireplaces, &c. 16,860, Jagger, apparatus for placing driving straps on their pulleys. 16,866, Simpson, swinging doors. 17,005, Ewing, stoppers for earthenware pipes and junctions. 17,338, Evans, self-flushing closets. 17,448, Brodie, wood paving blocks. 17,513, Provand, disinfecting appliances. 17,556, Hutchison, baths. 18,459, Alves, firegrates. 18,625, Long, vices.

1901.—2,412, Sutton, joint for metallic and earthenware pipes. 6,364, Falk (*Hildebrandt*), incandescent gas-burners. 7,000, MacCallum, domestic fireplaces for the prevention of smoke. 8,465, Ray, sash cords. 9,141, Innes, lavatory stands or basin frames. 9,222, Fischer, incandescent gas-burners. 9,552, Cooley, metal expanding channels for wood paving and wood-block floors. 9,923, Jackson & W. W. Whitehead Co., pipe wrenches. 10,726, Weber & Schön, appliances for adjusting windows or casements. 12,521, Law, gas-burners for use with incandescent mantles. 12,537, Hoshor & Platt, hoisting booms. 12,625, Hills & Southard, door checks. 13,282, Moessner, roller-blinds. 13,391, Höybÿe, Lyngbye & Thalbitzer, door locks. 13,401, Sutton, fans for ventilating ice safes. 13,556, Baxter, apparatus for breaking stone or bricks.

NEW SAVINGS BANK, NORWICH.

New premises have been erected in Red Lion Street, Norwich, for the Norfolk and Norwich Savings Bank. The elevation to the street is of white stone. Messrs. G. J. & F. W. Skipper are the architects, their design having been accepted in a competition restricted to the architects of the city and county. The architectural style adopted is that of the English Renaissance, freely treated and adapted to modern bank buildings. A feature of the exterior are the large plate-glass windows on the ground floor, and the plain plinth, heavily rusticated doorways and massive granite columns. On the first floor—where the boardroom is —the windows at either end are designed with rusticated columns and pedimented entablatures. The intervening space is divided by pilasters running up through two floors and capped with Ionic capitals, and the bays between these pilasters are filled with arched window openings, surmounted by carved swags of flowers and fruits suspended from lions' heads, giving a connecting idea at this level and a richness to the whole facade, especially as above these the second floor windows have their simplicity broken up by an ornamental stone baluster-mullion. A strongly marked entablature runs along the whole of this portion of the front carrying a solid stone parapet. At either end this entablature is stopped and the cornice alone continued through, which increases the wall surface and presents a greater solidity of treatment at each end, so as to give support and also a foil to the richness of the other part of the work. Over the main entrance the pediment is broken and carried up in curved lines, and a panel having the Arms of the City carved upon it is introduced. The whole is surmounted by three curved urn-shaped terminals. The other end has a segmental pediment with a simpler treatment above it. The vestibule to the bank has a curved inner stone wall pierced for a window and divided by stone columns, and filled with coloured lead glazing to light the secretary's room. From this vestibule, through glazed swing-doors, the banking hall is reached. This room is 33ft. 6in. long, 25ft. 6in. wide and 16ft. high. The walls are lined with marble to about two-thirds of their height, and the windows and doors are arched over with the same material. The skirting and the impost or cornice moulding are of a veined black marble called Bleu Belge ; the pilasters are of a rich yellow-veined marble called Imperial Pavonazzo ; the filling space between the pilasters is of a veined cream-grey marble called Piastraccia ; and the arches and keystones over the doors and windows are of the green marble Vert des Alpes. The glazing in the front windows is of plate glass, whilst that of the arched windows at the rear is of lead glazing in a floral pattern. The ceiling is coffered and the spandrels between the arches, &c., are occupied with consoles of a decorative character. The counter and the other woodwork fittings, which still remain to be completed, will be of mahogany. They are the work of Messrs. Chamberlin, Sons & Co. A prominent feature is the marble fireplace at the west end of the banking hall, where provision is also made for the clerks' entrance and for the main staircase to the boardroom and upper parts of the premises. The light is supplied by pendant electric lamps suspended from the ceiling, artistically executed in copper and brass, hand-wrought with enamel ornaments. On the first floor is a landing which leads to the boardroom, auditor's-room and cloakroom. The boardroom is 26ft. long, 23 feet wide and 12 feet high, and is well lighted by windows front and back. The panelled oak chimneypiece forms a mark of interest in this room. On the second floor are two storerooms for old books and papers, and the remaining accommodation is adapted for the caretaker's apartments. The heating of the whole premises is effected not only by open fires in certain rooms, but by radiators introduced in suitable places—in the banking hall, passages and the two large rooms on the second floor. Under a part of the building is the basement, which is used for the heating apparatus and storage of coals, &c. The general contractors for the work have been Messrs. Scarles Brothers, Queen's Road, Norwich ; the masonry has been carried out by Mr. J. G. Bush, St. Catherine's

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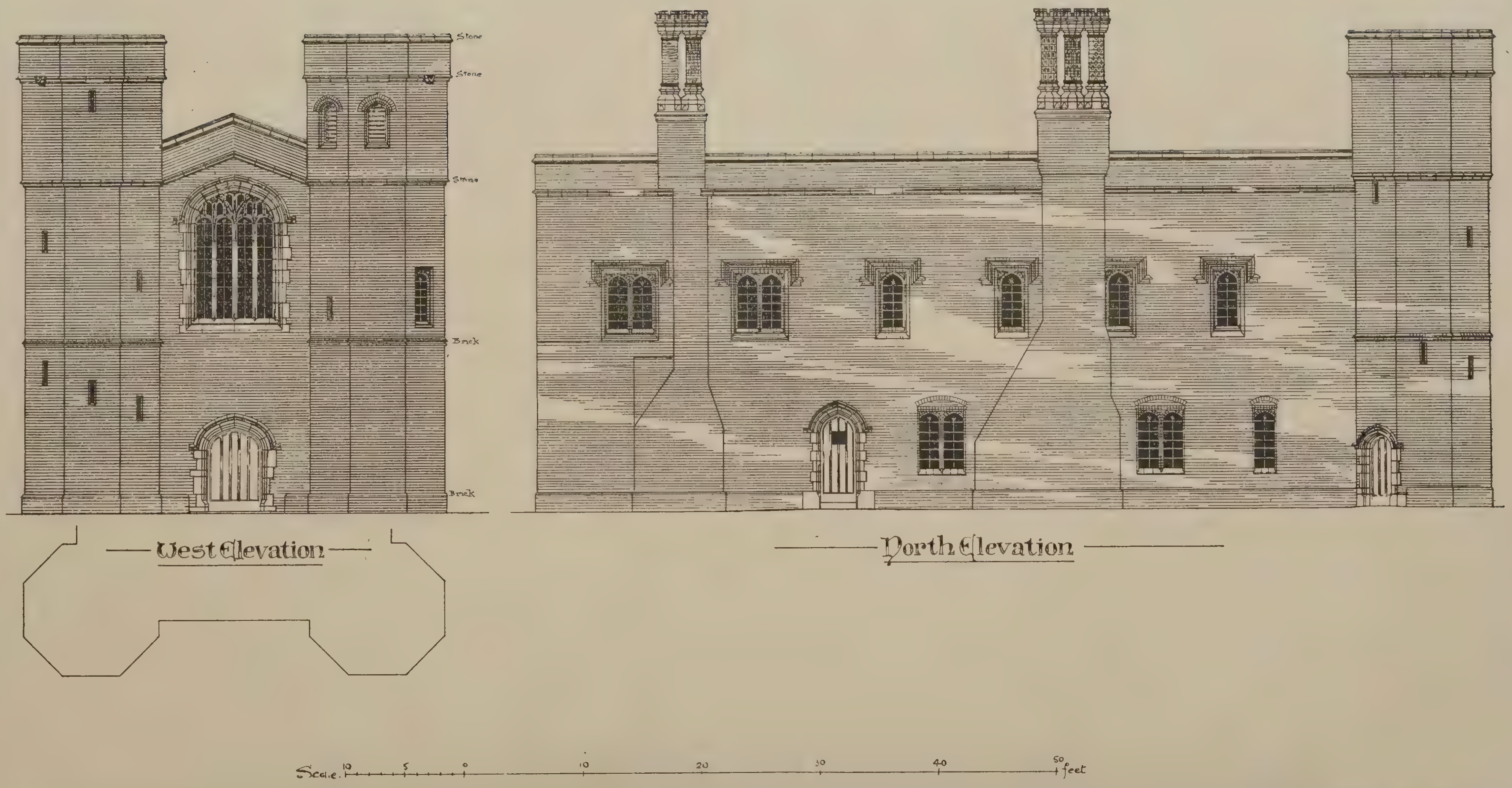

MAGDALEN COLLEGE SCHOOL, WAINFLEET, LINCOLNSHIRE. Measured and Drawn by FRANCIS P. HALSALL, A.R.I.B.A.

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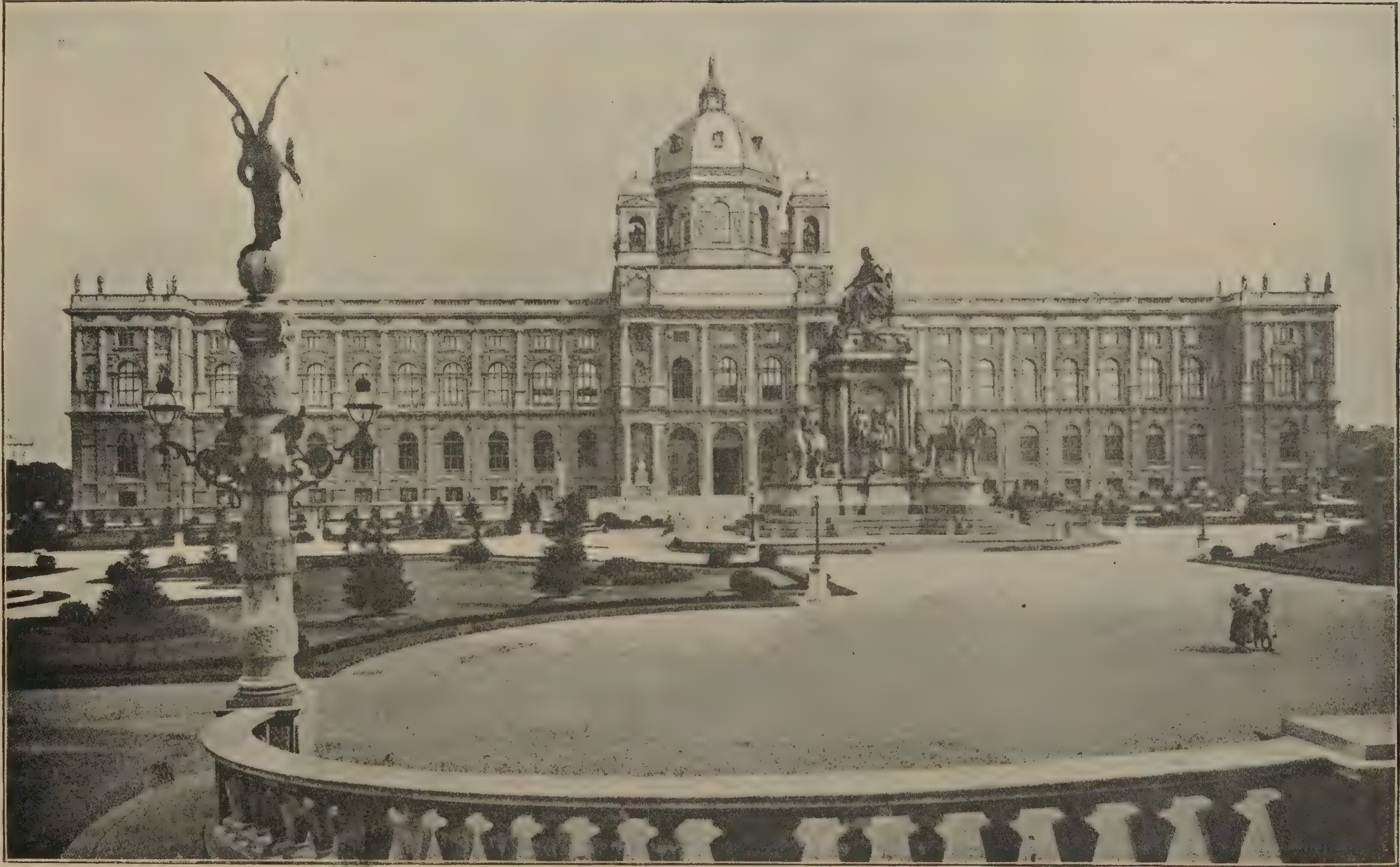

MUSEUM OF ART AND INDUSTRY, AND THE MONUMENT TO MARIA THERESA. VIENNA. Semper, Architect.

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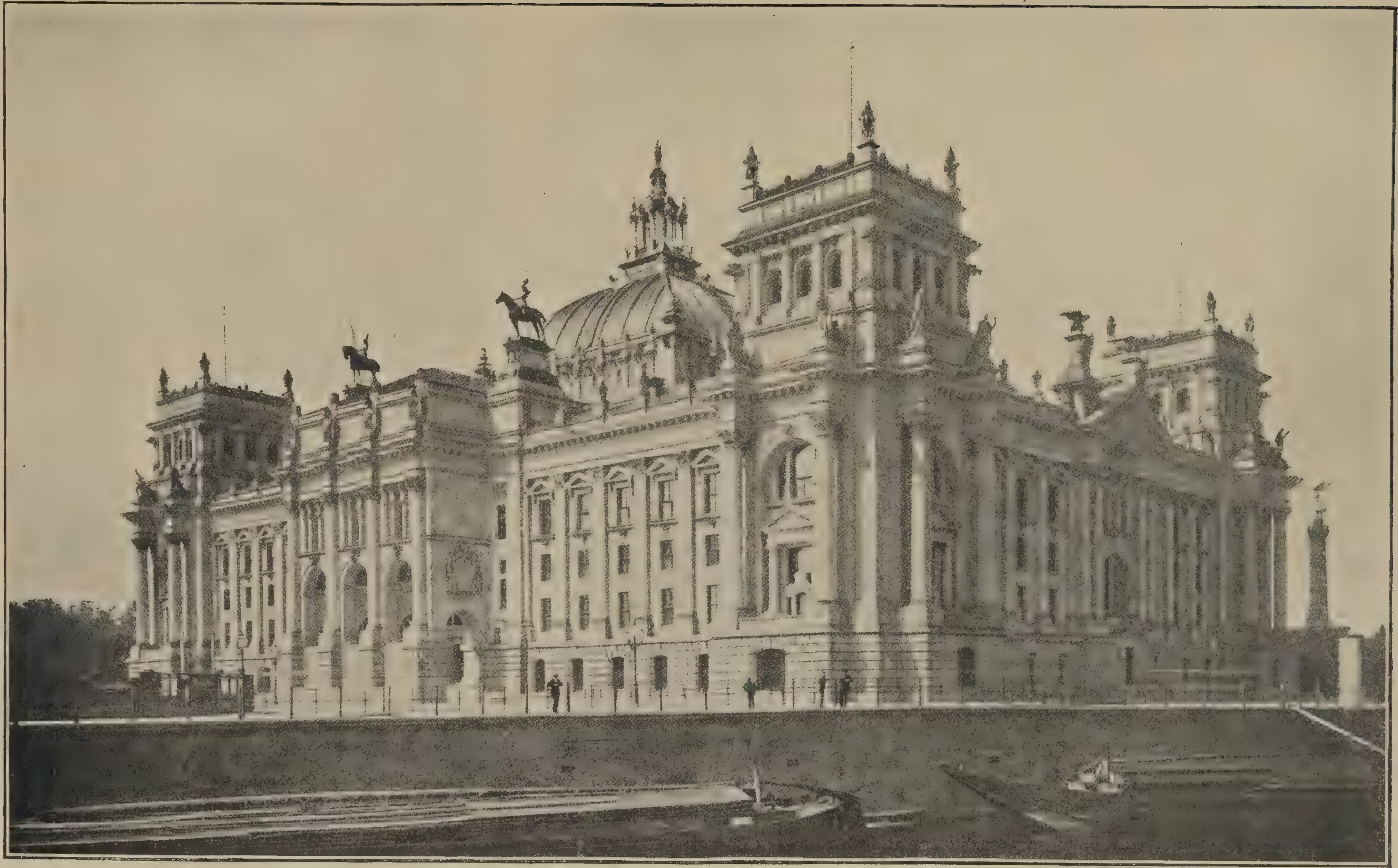

THE NEW PARLIAMENT BUILDING AT BERLIN. PAUL WALLOT, Architect.

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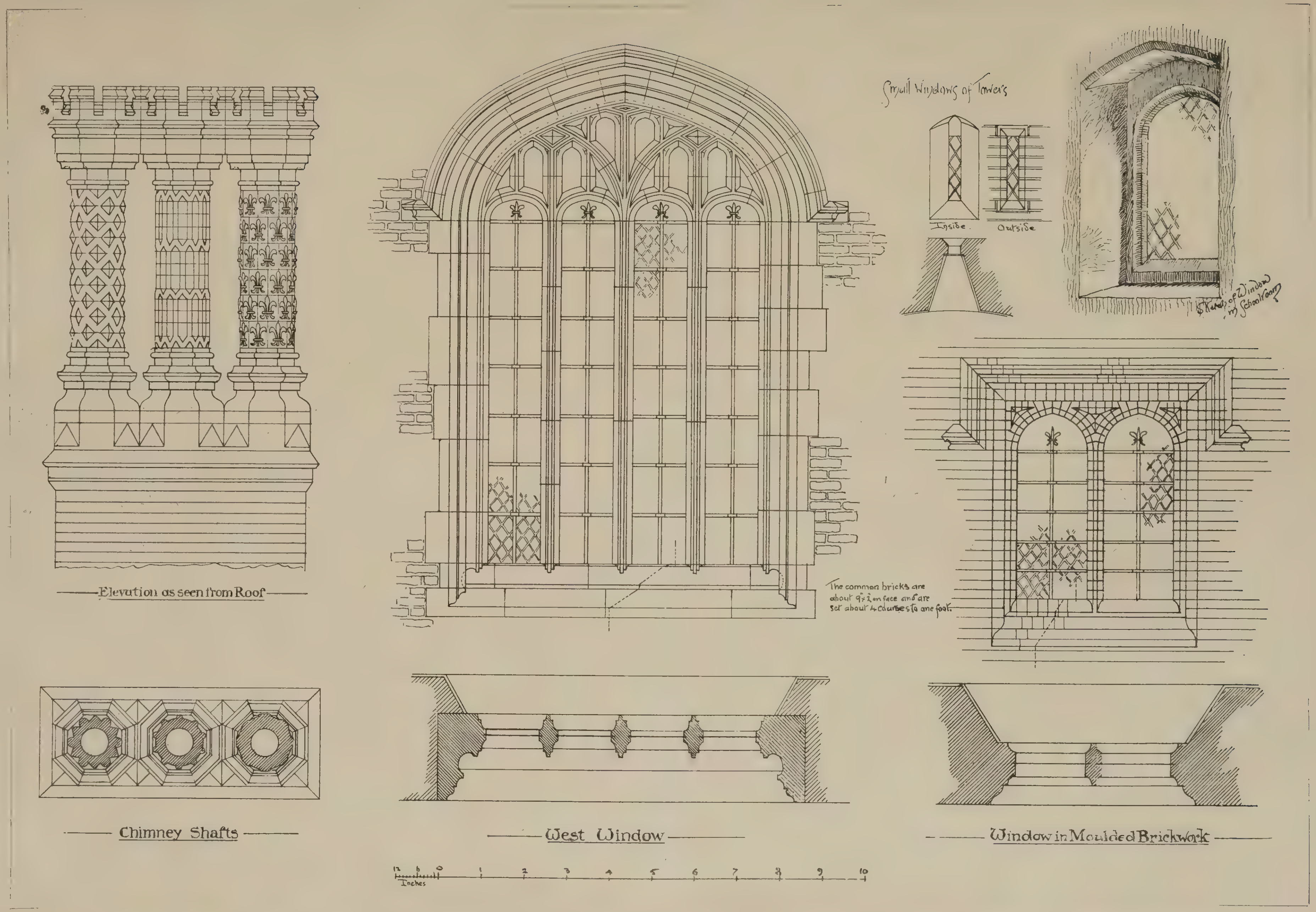
Elevation as seen from Roof
Chimney Shafts
West Window
Small Windows of Towers
Inside.
Outside
Sketch of Window in Schoolroom
The common bricks are about 9"×2" on face and are set about 4 courses to one foot.
Window in Moulded Brickwork
12 6 0 1 2 3 4 5 6 7 8 9 10
Inches

MAGDALEN COLLEGE SCHOOL, WAINFLEET, LINCOLNSHIRE · DETAILS. Measured and Drawn by FRANCIS P. HALSALL, A.R.I.B.A.

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Plain, Norwich; and the carving executed by Mr. Minns, of Norwich. The marble work has been done by the Art Pavements and Decorations, Ltd., London. The heating apparatus, fireplaces, &c., have been supplied by Messrs. Barnard, Bishop & Barnards, Norwich; the electric lighting, wiring and fittings by Messrs. Pank & Son, Norwich; and the electroliers in the banking hall by Messrs. Neatby, Evans & Co., London.

MAGDALEN COLLEGE SCHOOL, WAINFLEET.

By FRANCIS P. HALSALL, A.R.I.B.A.

THE following interesting account of this building (which is illustrated by two centre-plates in this issue) is transcribed from the "Life of William of Waynflete, by Tomas Chaloner" (Dr. Chandler, of Selbourn, Hants), written some years previous to 1755; the description of the "Schoolhouse" is by a former master of the school, "Master John Pickburn," dated 1755.

"The bishop possessed certain lands and tenements at Waynflete which William Aulekar and Richard Bennington had devised to him by will, 10th May, 1475 (15 Edw. IV.). He was desirous, by planting grammar learning in the place of his nativity, to extend it in the northern provinces of the kingdom, and resolved to erect there a school and a chapel as he had done near his college. He employed Master John Gigur, warden of Merton College, Oxford, and of the College at Tateshall in Lincolnshire, to procure a site and to contract with workmen for the building; and the indenture for the carpentry is dated the twenty-fifth of April 1484 (1 Ric. III.). He conveyed to the same person the property before mentioned to be made over by him to the President and scholars of Magdalen for the endowment. This amounted to ten pounds a year in land, as we are told by the antiquary Leland; the sum assigned by the head-master for his salary by Wykeham at Winchester, king Henry at Eton, Waynflete at Magdalen, and at St. Paul's, if I mistake not, by Dean Colet. In 1579 Robert Woolbie added to his will forty shillings a year for ever to the stipend."

The following is the description of the "Schoolhouse":—

"The edifice which stands on the south side of the town is handsomely constructed with brick. The length is seventy-six feet, the breadth twenty-six. It consists of two storeys; and appears to have been designed for only two rooms; unless a room twenty feet by eighteen, divided by a partition of solid brickwork towards the east end of the lower storey, belonged to the original plan. It has two towers which project at the west end. In the northern is the staircase; in the other a bell with the inscription round the crown in old capital letters 'Ave Maria Gra Sia Plena,' in which a mistake in one word may be imputed to inadvertency or ignorance. Perhaps the lower storey was intended for the school and an apartment for the master. It now affords a complete habitation to him and his family. The upper part is the present schoolroom, seventy feet long and twenty broad, with six windows on each side and two large ones in the ends. The former have been filled with lilies painted on single panes, of which more than a hundred remain irregularly scattered; some very clear, others obscure; inverted or upright, as they happened to be put together in repairing. All the windows have been strongly ironed; and those below have had massive shutters on the inside, as appears from the iron hooks left in the wall. The civil war and license of the barons had rendered precaution necessary. It was unsafe to abide in a dwelling not barricaded or fortified; a man's house was indeed his castle. What an age to live in!

"The painted glass of the two large windows of the upper storey was removed or destroyed before August, 1755. In 1629 the arms of the founder were extant in that at the west end in two places; in that at the east in one. His portrait was also visible in the latter with the following verse:

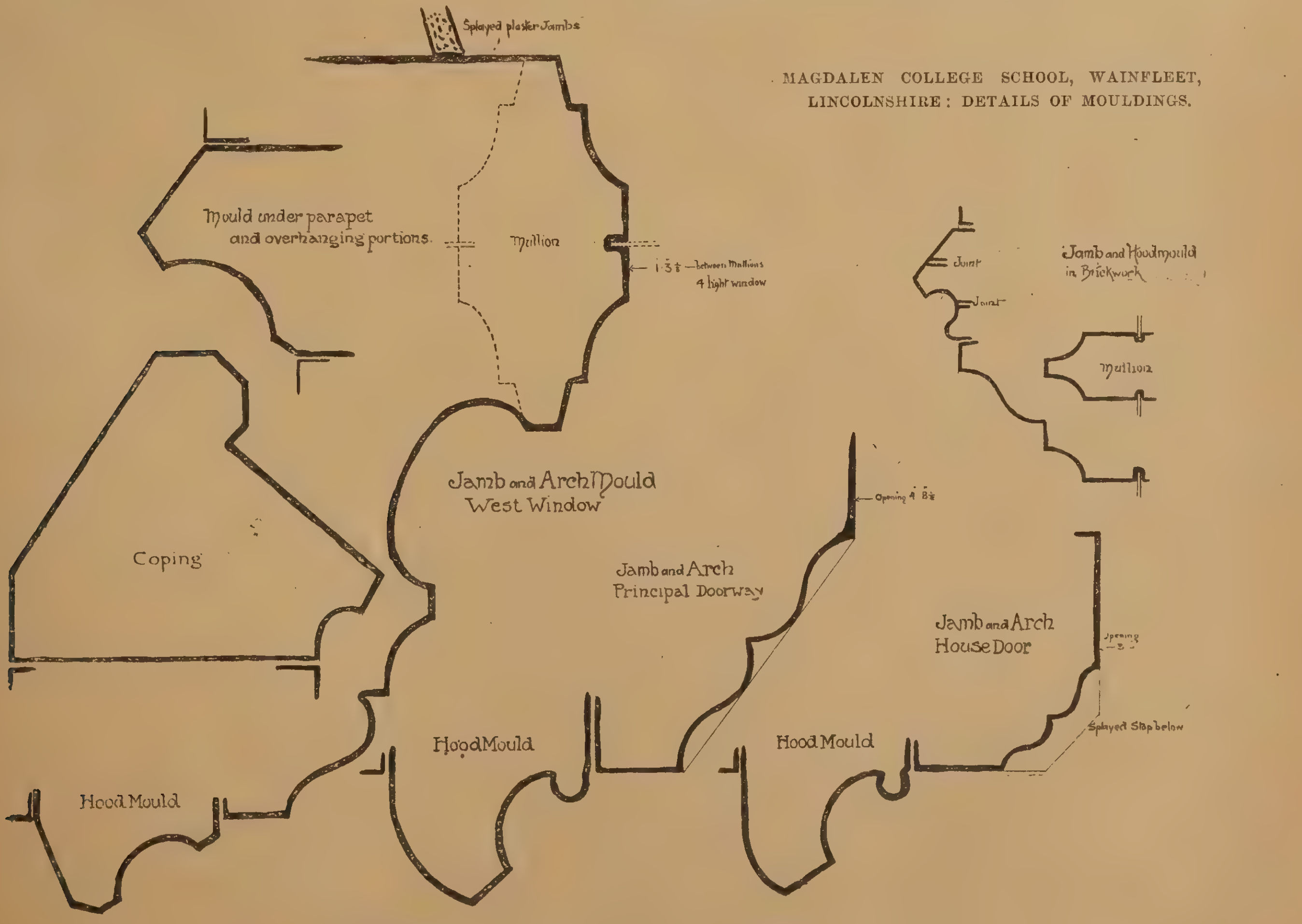
'Vulnera quinque Dei sint medicina mei,'

which it is likely had been preceded by an hexameter, likewise in monkish rhyme, making mention of the five joys of the Virgin Mary. The five wounds of Christ were of great celebrity in the Papal church. They were displayed with a chalice on the banner of the rebels who advanced from the north brandishing a cross before them in the time of Queen Elizabeth. The office of Mass to be celebrated in commemoration of them was, according to the rubric, delivered to Boniface Bishop of Rome by the Angel Raphael in person, who told him among other extraordinary things that if it were used for the dead as soon as it should be ended five times the soul should be freed from purgatory. Waynflete, who believed in its efficacy, ordered, as will be seen from his testament, that it should be said for him five thousand times. An altar after the Romish fashion, with an image probably of Mary Magdalen, adorned, I suppose, one end of the upper room which was the chapel and was removed at the time of the Reformation. A pulpit and reading desk remain, but fixed on the tops of two scholar seats and visibly of later construction. Though not intended for a place of general public worship, it is used instead of the church, which is about a mile distant from the town, every other Sunday during the winter season; and it has accommodation for as large a congregation as commonly assemble in the neighbourhood. This practice after being discontinued many years was resumed in 1785."

The building was restored in 1856 and became the middle-class school of the district. In 1877 it was reopened as a secondary school for boys and girls, and as such has been very successful. Boys of marked ability are affiliated to Magdalen College School, Oxford, and exhibitions of the annual value of £40 are given by the college for their education and maintenance.

The Rev. W. Gerrish, M.A., is the present master, and I am indebted to him for the above account of the building.

The common bricks used in the construction are about 9in. by 2¼in. on face, and are set with wide joints, ten courses measuring about 2ft. 5in. In various parts, notably on the lower part of the towers, vitrified bricks are set in various devices, said to be probably masons' marks. The two chimney stacks, which are very fine, were (I believe) carefully re-set by a local builder a few years ago.


Splayed plaster Jambs
Mould under parapet and overhanging portions.
Mullion
1·3⅛ — between Mullions 4 light window
Joint
Joint
Jamb and Hoodmould in Brickwork
Mullion
Jamb and Arch Mould West Window
Opening 4' 8½"
Jamb and Arch Principal Doorway
Coping
Jamb and Arch House Door
Opening 3'
Splayed Stop below
Hood Mould
Hood Mould
Hood Mould

MAGDALEN COLLEGE SCHOOL, WAINFLEET, LINCOLNSHIRE: DETAILS OF MOULDINGS.

MEASURED AND DRAWN BY FRANCIS P. HALSALL, A.R.I.B.A.

THE RESTORATION OF KARNAK.

NEVER since the old worshippers crowded the great hall of the Temple of Karnak has that ancient shrine seen so much activity as now prevails. Hundreds of Arab labourers are now at work there, and all the accessories of a great modern engineering enterprise lie contiguous to the grandest memorial of ancient Egypt. Undoubtedly the most important Egyptological work now in progress is the restoration of the Hypostyle Hall. The following description of the present state of the works is by M. Legrain, the inspector and designer for the Ghizeh Museum, who is directing the restoration. There are twenty-seven columns in all that are to be restored. Thirteen fell in ancient times; eleven came down on October 3rd, 1900; and three, which were shaken and threatened to fall, were taken down last year. All these twenty-seven columns will be reconstituted and replaced in their original positions. The first step that had to be taken after the fall of the eleven columns was to take down the three columns whose destruction appeared to be imminent and would have entailed further ruin. One column has also an architrave which threatened to come down, and this enormous piece of stone has also to be removed.

Owing to the impossibility of removing this huge block, which weighs 42 tons, it was necessary to resort to the original method whereby the old Egyptians erected the monuments which are the wonder and admiration of the modern world. Accordingly M. Legrain made a huge inclined plane which required 100,000 cubic metres of earth for its construction. The architrave was taken down by this means, and the enormous accumulation of soil which its removal necessitated is now being gradually removed. The following figures will give some idea of the immense labour involved. Each column has an abacus, 12½ tons, and 13 segments, 14 tons; or twenty-seven pieces altogether. There are, therefore, 729 pieces to be found from out of the mass of ruin which the Hypostyle Hall now presents, and to be numbered and taken away to the depot, and 472 still remain to be discovered and removed, without counting the architraves, which weigh 50 tons, or 25 tons each. On an average six of these blocks are removed every day.

It is an immense labour, for each block has to be methodically arranged and numbered, and placed in reserved space until the time comes for all to be pieced together. Many hundreds of workmen are employed. Each man receives 5d. a day and each boy 4¾d. After everything has been removed from the Hypostyle Hall a commission will come to Luxor to study the foundations and arrive at the necessary means of consolidating the whole. In the summer the hall will be left to dry, and work will be recommenced as soon as the Nile flood permits. By May, 1904, it is hoped that everything will be finished. As visitors enter the Hypostyle Hall they at once notice that the two pylons of the hall are shored-up. These pylons also threatened to fall at the same time as the columns collapsed, and provisional props have been made to avert the calamity. Nothing has yet been done, and the work of underpinning the foundations has to be commenced and, it is hoped, will be taken in hand shortly.

The foundations of this temple of the God of the Morning have been found to be bad, and the columns are being underpinned. Many blocks have fallen and will be pieced together and replaced. A grand find was made on December 28th last. M. Legrain came upon a most beautiful bust of the god Khonsu. Three other portions of the same statue have also been discovered, and it will, therefore, be possible to restore this fine statue in its entirety, with the exception of the small piece which is wanting to complete one of the legs. The statue belongs to the epoch of Hormhabi, nineteenth dynasty, *circa* 1900 B.C. The name of the god is inscribed on the pendant at the back of the collar, and the inscription runs: "Khonsu of Thebes, God of the Day." The expression of this deity is very fine, and it is an excellent example of ancient Egyptian sculpture at its best. The god is decked with the usual emblems, such as the Nilometer, the sceptre Ouas, the flagellum, the pedum, etc. On one side of the head is a long curl worn by young Egyptians in antiquity, a symbol of youth. It is still in use among the young fellaheen. The statue, when restored, will be placed *in situ* in the temple, and will form a magnificent addition to the treasures of Karnak.

Surveying and Sanitary Notes.

An Open Space for Wandsworth.—The local committee at Wandsworth who have in hand the proposal for providing Southfields, Wandsworth (which has a large working-class population), with a recreation ground have ascertained that the price of 16 acres of land in the vicinity is £24,000. The land, the committee report, is desirable and the price reasonable, seeing that £2,000 an acre is being realised for land in the immediate locality. It is hoped to raise half the money locally, and to secure the other half from the county council, this being in accordance with that body's usual practice.

The Society of Landed Estate Agents has just been inaugurated. The principal objects are: (1) to promote and protect the interests of the profession; (2) to advise by mutual conference on all matters of practice relating to the management of landed estates; (3) to disseminate information by means of publications, correspondence, &c.; (4) to watch legislation on matters affecting the interests of agriculture and land generally; and (5) to provide a centre in London for members. The provisional council consists of the following: Colonel Halifax Wyatt, for many years agent to the late Earl of Sefton, president *pro tem.*; Mr. E. F. Chamier, agent for the Rolle estates, North and South Devon; Mr. Dudley W. Drummond, agent for the estates of Earl Cawdor and others in South Wales; Mr. Reginald C. Glanville, agent for the Antony and other estates in Cornwall; Mr. Godfrey Lipscomb, agent for the Margam estates, South Wales; Mr. E. G. Wheler, chief commissioner to the Duke of Northumberland; and the secretary (*pro tem.*) is Mr. William Broomhall, 16, Cockspur Street, Pall Mall, S.W. Membership is restricted to landed estate agents, their pupils and assistants.

Wood-Paving.—Mr. H. B. Lefroy, Agent-General for Western Australia, recently wrote to the "Times" with reference to the decision of the council of the city of Westminster at its last meeting to proceed with paving to the extent of over 130,000 sq. yds., of which about 110,000yds. is to be laid down in wood, involving a cost to the ratepayers of over £70,000. The council decided to award the contract to American red gum and creosoted Swedish yellow deal. He says: "My Government has spent large sums of money in demonstrating the special merits of Australian hardwood for street-paving, and my predecessor, Sir Edward Wittenoom, K.C.M.G., published a pamphlet last year giving in a condensed form the opinions of competent surveyors and engineers in all parts of the United Kingdom, forming an overwhelming mass of testimony that 'Western Australian hardwood blocks, well cut, true to gauge, laid on an efficient system, and carefully supervised, both during and after laying, constitute for city and suburban thoroughfares the best paving known.' . . . . I would earnestly submit that the ratepayers of the city of Westminster should not rashly embark on an untried experiment with a foreign wood to such an extent while thoroughly tried material from another part of the British Empire can be put down at less ultimate expense." He suggests that before adopting what appears to be an undertaking of an experimental character a full statement of the reasons for abandoning what most surveyors consider the best-known paving be laid before the community at large.—Mr. Edward Alcott, of Sunderland Wharf, Millbank Street, Westminster, S.W., replying to this letter, says: "The Hon. H. B. Lefroy is evidently labouring under a great mistake when he asserts that red gum is an 'untried experiment. This wood was first laid as a test in the Strand, at Morley's Hotel by Mr. George Green, late of St. Martin's Vestry. A piece of jarrah, a piece of yellow deal, and a piece of red gum were laid at the same time. The jarrah and deal are both worn out and were removed five months ago; the red gum is there to-day and will last another two years. Before casting insinuations at my wood, would it not be as well to make an inspection of Regent Street, Piccadilly, Tottenham Court Road, Hammersmith High Road, Pall Mall, East Pall Mall, Panton Street, Oxenden Street and Green Street? Green Street was laid five years ago with West Australian hardwood, which has recently been replaced with creosoted yellow deal. The Rue de Lafayette, Paris, is also laid with West Australian hardwood, and will be taken up next month and laid with my red gum. If the Hon. H. B. Lefroy can show three engineers of prominence a street in the West End of London paved with either karri or jarrah that has been down six years under omnibus traffic and now in good condition, I will give £1,000 to any charitable institution you may name. Surely this is a matter for engineers to decide which is the best wood for street-paving, not timber merchants and others indirectly interested.'

SCHOOL BUILDINGS.

BOARD OF EDUCATION'S RULES.

THE Board of Education has issued the following rules as to the building of Higher Elementary Schools:—

1. Article 110 (6) of the code limits the numbers of a higher elementary school to about 300. For such a school ten classrooms will generally be required, since every class should have its own classroom. Of the ten classrooms at least four should be suitable for a class of forty scholars.

2. (*a*) A classroom for forty scholars should have an area of about 620 sq. ft.; a classroom for thirty scholars should have an area of about 480 sq. ft. (*b*) All classrooms must be furnished with single desks; the desks should be 2ft. long, arranged in pairs with intervals of 2in. and gangways of 2ft.

3. Every higher elementary school should be provided with suitable laboratories. (*a*) The laboratory accommodation must be sufficient to provide at one time for the largest class in the school. (*b*) There should generally be one laboratory for chemistry and one for physics. (*c*) A laboratory should afford 30 sq. ft. of floor space for each scholar; the minimum size will therefore be 600 sq. ft., but it is, as a rule, desirable that the laboratory should be somewhat larger. If, however, the laboratory accommodates more than twenty-five scholars, a second teacher would be required. (*d*) Laboratories must be fitted with suitable tables, which must be well lighted; they should be properly supplied with gas and water. For chemical laboratories, sinks, cupboards and the necessary fume closets must be provided. (*e*) A small balance-room may be provided if desired.

4. (*a*) In addition to the classrooms and laboratories, it is desirable that a higher elementary school should include at least one lecture-room, which should be fitted with (1) demonstration table furnished with a gas and water supply and a sink, and (2) a fume closet. A lecture-room should have an area of about 750 sq. ft. (*b*) A small preparation-room fitted with bench sink, cupboard and shelves, and proper supply of gas, should be provided in a convenient position for the lecture-room.

5. A drawing classroom for the more advanced drawing is desirable. It should provide 30 sq. ft. of floor space for each scholar; the best size will be a room with an area of 750 sq. ft. If suitably lighted the hall would answer for this purpose.

6. Other special rooms for cookery, laundry-work and manual instruction should be provided in accordance with the rules in Schedule VII. of the code.

7. A higher elementary school may be planned with a central hall, but no class (other than drawing) can be recognised in such a hall. Good dimensions for such a hall would be 50ft. by 25ft. As an alternative the hall might be adapted for use as a gymnasium when occasion requires. Such a gymnasium for a school of 300 children should have a floor space of 1,800 sq. ft. The gymnasium should not be adjacent to the laboratories.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Water Tower.

NEWCASTLE-ON-TYNE.—ENQUIRER writes: "A water tower is 38ft. high from ground to coping, the tank at the top being 14ft. by 13ft. by 6ft. high of water. The walls are good sound rubble, with a through stone every yard super., 2ft. thick and lined with Claridge's asphalt. The weight of water when full is 30⅓ tons. Will such a construction be strong enough without ties?"

The strength of a rubble wall depends so much upon the quality of the work that it is difficult to judge without seeing it. The lining of Claridge's asphalt is very peculiar. The same amount of material would have made a stronger building if the walls had been thinner at the top and thicker at the bottom. If the foundation is good the tower may be strong enough for the purpose, but there will not be much margin towards the bottom. Tie bolts should not be needed, but there can be no harm in placing 1¾in. bolts with 1½in. ends across the centre 10ft. apart vertically. If, however, the walls are already built it will be better not to disturb them by putting in bolts. HENRY ADAMS.

Rowton Houses.

CARDIFF.—ENQUIRER writes: "Where can I obtain information about the construction and cost of model dwellings erected according to Lord Rowton's principles?"

An article by Mr. H. B. Measures fully describing the Rowton houses was published in our issue for March 20th last.

American Architectural Papers.

HOVE.—HOVE writes: "Which is the best building paper (also being the best medium for advertisements for appointments) published at Boston, U.S.A.; also, what classes are held at the Boston Architectural School, day and evening, and the fee for attending them?"

"The American Architect and Building News" (weekly, 50 cents—eight dollars a year post free to this country; 211, Tremont Street, Boston, Mass.) is a good paper, though it contains little in addition to its plates. "The Architectural Review" (monthly, 50 cents—six dollars a year post free to this country; Bates & Guild Co., 42, Chauncy Street, Boston, Mass.) is a better class production, its plates being especially good. "Architecture" (monthly, 30 cents — four dollars a year post free to this country; Forbes & Co., Ltd., 160, Fifth Avenue, New York) is even better produced, though its plates are not so numerous. "The Brickbuilder" (monthly, 50 cents—six dollars a year post free to this country; Rogers & Manson, 85, Water Street, Boston, Mass.), as its names implies, is devoted to brick and similar buildings. For your purpose we think you will find the "American Architect" most suitable. Its charge for small advertisements is 15 cents a line (eight words to the line) each insertion, 50 cents being the least charge. In regard to your other question, a long article on the Department of Architecture of the Massachusetts Institute of Technology at Boston appeared in our issue for August 14th last. Full particulars of the courses are given in this article, but if you desire further information you should apply to the secretary, Mr. H. W. Tyler, 491, Boylston Street, Boston, Mass., who will send free a special descriptive circular of the institution. We do not know, however, whether the fees for admittance are stated in this circular.

"The Architectural Review."

W. W. writes: "I desire to take in another paper in addition to yours. Please recommend one something like the "Studio," but not so expensive."

Obtain the "Architectural Review," published monthly at these offices, price 6d. nett. (see advertisement on page vii of this issue).

London Buildings to Measure for R.I.B.A. Final Examination.

LONDON, W. C.—W. P. writes: "Please mention a building in or near London (Renaissance style preferably) suitable to measure for the R.I.B.A. Final Examination where permission can easily be obtained."

Measure one of Wren's churches. An article on "The City Churches: How to Obtain Permission to Sketch and Photograph in Them" appeared in our issue for September 26th, 1900.

Buildings Exempted under Model By-laws.

CARMARTHEN.—ENQUIRER writes: "I shall be glad to know whether workhouses, schools and colleges, the plans, &c., of which have been approved and sanctioned by the Local Government Board, the Board of Education, and the Charity Commissioners are exempted under the Model By-laws."

Workhouses, schools and colleges are not exempted buildings. Under clause 2 of the Model By-laws the following descriptions of buildings are exempt: All buildings in His Majesty's possession or used and employed for His Majesty's service, prisons, county or borough lunatic asylums, buildings connected with the navigation or the collection of tolls in respect of docks, harbours, rivers or canals; buildings connected with the working of the mines; buildings erected according to plans approved by the Land Commissioners or Board of Agriculture under the Improvement of Land Act, 1864, or other Acts for the improvement of land; any building erected from plans approved or directed in pursuance of any statutory provision by one of His Majesty's principal Secretaries of State; together with any building used for a plant house, summer house, poultry house, aviary, &c., under the conditions laid down in this clause.

T. E. C.

Architect's Charges.

ENQUIRER writes: "Will you be kind enough to inform me whether the enclosed account is reasonable? The architect refuses to give up the plans until the account is paid, so I cannot send them to you, but the £20 is for plans for the erection of property on a very small piece of land. I have offered £40 in settlement and the architect has offered to accept £50."

Upon the face of it the account bears evidence of having been inflated to the utmost. At the same time, if the item of £20 was agreed upon as is stated, the rest is worth more than another £20, and it would be well to pay the architect the sum which he says that he is willing to accept, and so settle the matter; but not until he has delivered up the plans. No man can charge for goods which he retains, not even an architect. G. A. T. M.

Architectural Training.

MERTHYR TYDFIL.—AMBITIOUS writes: "I am in an architect's office, and have a few hours after 6 p.m. to study at home. How can I best employ my time? Is there any book instructing beginners how to prepare plans, sections, &c., to colour and trace well?"

We should advise you to attend evening classes in building construction and in geometrical and freehand drawing. You should obtain Rivington's "Building Construction" (4 vols.) if possible, or, if not, Mitchell's "Building Construction (2 vols.), a cheaper and smaller work, and study them thoroughly. "Hints on Architectural Draughtsmanship," by G. W. Tuxford Hallatt (1s. 6d.), gives a few hints on architectural drawing and tracing, but the best way is to obtain experience by practice. If you consider that your present employment offers little opportunity of gaining more knowledge, enter a builder's office and thence go on the job, or obtain a post as time-keeper or under-foreman if you can get anyone willing to try you. Thus you could gain an insight into practical building. If you feel you have sufficient ability, you should study mathematics and mechanics (see answer on this subject on p. 122 of our issue for March 20th last), and draw from natural objects such as flowers, birds, animals, &c.; and when skill has been acquired in accurate delineation and harmonious colouring, trees and landscapes can be worked at. This is the finest education of taste you can have. Read Ruskin's "Elements of Drawing."

RUSHDEN.—O. R. writes: "I am twenty years of age, and have had about four years' general experience. I desire to sit for some examination, the 'working up' for which would take me through a good field of study, and which would afterwards be a sound qualification. I may say that the R.I.B.A., with its exhaustive demands, would, I fear, be too heavy a task for me to undertake."

The R.I.B.A. examinations are on the whole most excellent. Anyone who aspires to call himself an architect should know as much as is required to pass them, but of course the examination system is not suited to some persons. If you really do not feel capable of the R.I.B.A. examinations, the Society of Architects hold a single one which appeals to many; particulars can be obtained from p. 263 of our issue for December 6th, 1899. Then the South Kensington Examinations offer a graduated course in building construction.

Wrexham Parish Church.

LONDON, N.—S. M. M. writes: "Has St. Giles', the parish church of Wrexham, Denbighshire, been illustrated in your journal? If not, is it likely to appear shortly?"

No.

Situation and Soil for House.

HEYWOOD.—H. L. writes: "Which is the best position in which to build a house, and which is the best land? The land I have in view is facing south and, I believe, is sandy."

A sandy subsoil is a suitable one to build upon as it does not retain moisture, which clay does. The aspect of the house you have in view is a good one: the living room should face south, as it is most important that it should get the sun for a good part of the day. The kitchen should, if possible, always face north, for in the summer it needs to be as cool as possible, while in the winter the fire will warm it. A good steady light is always required for a kitchen; if possible it should fall on the range from the side, in order that a shadow may not be cast over it when a person is at work.

Obtaining a Situation in a Belgian Architect's Office.

SOMERSET.—SOMERSET writes: "What steps should I take to get into a Belgian architect's office? Would an English assistant be able to get a berth in a foreign office as tracer at a small salary? I wish to study old work in Belgium, but not having sufficient means to keep myself there for any length of time the above seems the only course open to me."

If you can speak French well and are a good tracer, with a knowledge of building construction, you would perhaps be able to obtain a situation in a Belgian architect's office, but the remuneration would be small. You had better apply to the British Consul at Antwerp or Brussels for advice as to where best to hear of situations vacant and apply to several architects. Of course you would be more likely to obtain a berth if you were over there first. But, after all, is it worth taking all this trouble to study Belgian architecture? Information of use in architectural work can be gathered as well from old and new buildings in this country, and perhaps better. You might go on a holiday tour, however.

Drawing Flutes on Columns.

PADIHAM.—H. H. writes: "In preparing the sheets of orders for the R.I.B.A. Intermediate Examination, is it necessary to show the flutes throughout the whole length of the columns? In the case of columns with entasis this would prove tedious, I think."

The entasis is so slight that it is not difficult to draw by carefully and regularly increasing or decreasing the distance at which the point of the drawing pen is kept from the edge of the T-square or straight edge, the positions of the flutes having been laid down in advance at several different positions along the height of the column. A little practice should be indulged in first, however, on a piece of tracing paper, and if the experimental efforts are not successful the flutes might be shown in pencil throughout, but inked in for a short distance only at top and bottom. G. A. T. M.

THE ERECTION OF TEMPORARY BUILDINGS.

IN an article on "Light Buildings, Locks and Safes" which recently appeared in the columns of the "Morning Post" Mr. W. E. Martin said:—

For the rapid erection of fireproof and weatherproof temporary buildings galvanised corrugated iron is indispensable. As a sanitary material it is perfect, being absolutely non-porous. In point of fact no other constructive material can replace it, where the security and comfort of a permanent building are required for a limited time at a proportionately moderate cost. One great objection to all other materials used for external wall facing and roofing is that they are more or less porous. Brick and stone, for example, absorb rainwater in large quantities, and this is transmitted into the inside of the building and gradually thrown off into the atmosphere, thus rendering it damp and uncomfortable for days together in the immediate vicinity of walls faced with these materials. The use of corrugated iron does not expose the occupants of a building to any such annoyance. It should be borne in mind, too, that in an ordinary wall of brickwork the mortar joints are more porous than the bricks, and act as efficient conductors of rainwater to the inside plastering. As a brick wall 12ft. high is made up of at least 1ft. of such mortar it is not surprising that after driving rain in exposed situations damp should show itself on the inside plastering.

"Galvanising."

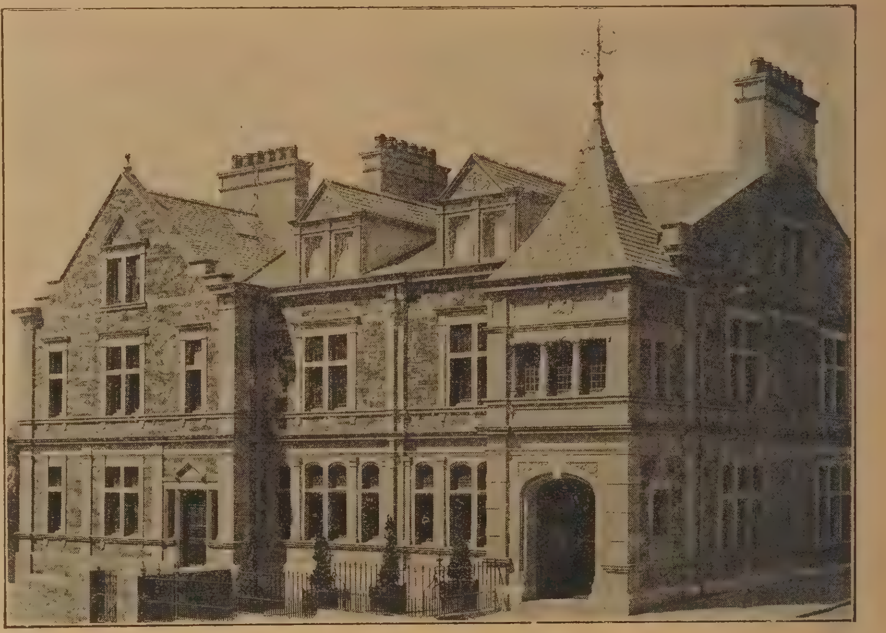
Galvanised iron sheets are always fixed overlapping horizontally as well as vertically; hence the joints are as watertight as the sheets themselves. The term "galvanised" as applied to the iron sheets under consideration is incorrect, in view of the fact that no galvanic action is necessary to coat iron with zinc. A sheet of iron, the surface of which has been chemically cleaned, will when dipped in molten zinc take up enough of that metal to afford an efficient protection against the weather for years. Hence the iron is really "zinced" and not "galvanised."

Rust.

In dry air at ordinary temperatures iron will not rust. When heated to redness, however, black scales of iron oxide are formed, and when at a white heat the whole metal is gradually converted into the same substance. Pure water, which is free from carbonic and free oxygen, will not tarnish polished iron, but if water contains these substances it attacks it vigorously, especially in presence of acid vapours of any kind. Zinc, which is used to coat the iron sheets, is also found in combination with carbon and oxygen, in which condition it is known as calamine, the ore from which it is extracted for commercial purposes. Exposed to the atmosphere, zinc oxidises slowly, and since it is insoluble in water a zinc coating affords an effectual protection to the underlying metal as long as it lasts. Acids will dissolve the zinc oxide as well as the zinc itself, however, so that buildings covered with zinced iron should not be exposed to the action of acid fumes or water holding any trace of acids in solution. It follows therefore that the life of a sheet of zinced iron is that of the zinc which covers it.

Different Metals in Contact.

Another point to be considered is that two metals placed in contact and exposed to atmospheric influences invariably give rise to some form of galvanic action, which facilitates their combination with carbon and oxygen, a process utterly destructive of their value as covering materials. Old wrought-iron railings leaded into stone are found eaten away where the lead and iron come in contact, and lead-lined cisterns or soldered sheet lead traps invariably fail at the junction of lead and solder. In every modern house iron, copper, lead, tin and zinc are found in the same circuit, forming circulating and other water systems; the leakage of taps and other parts of such plumbers' work, as well as the failure of iron railings and lead cisterns, can be traced to this galvanic action, which would seem to be never taken into account by builders or sanitary plumbers. This action, apart from ordinary oxidation by the atmosphere, has much to do with the premature destruction of the zinced iron sheets used in temporary buildings. Zinced (or "galvanised") corrugated iron is extensively used in the erection of churches, schools, hospitals, cottages, stables, workshops, sheds, barns and other buildings, and it will be found that for all such erections the employment of specialists in this class of work has an immense advantage in point of economy over that of ordinary skilled or unskilled workmen, who are not accustomed to handle and work in this material.



BANK AT WINDERMERE. ROBERT WALKER, F.R.I.B.A, ARCHITECT.

How to Build.

The gauge of iron generally used for this work is that known as "24": this when zinced runs to "22" on the Birmingham gauge, and should weigh 1⅖lb. to the super. ft. or 1cwt. 0qr. 8lb. to the square of 100ft. Seven-pound lead to cover the same area would weigh 7cwt. 1qr. 14lb., slate about 7cwt. 1qr. 24lb., plain tiles 11cwt. 1qr. 1lb., and stone tiles 17cwt. 2qr. 1½lb. For roofing, iron is therefore a comparatively light covering, and, unlike tiles or slates, needs only a mere skeleton framework of timber to support it. Corrugated sheets are of various lengths up to 12ft., which is the largest made. The corrugations are 3in. or 5in. in width and about 1½in. deep. In a one-storey building it is an advantage to have the sides covered with sheets each of which reaches from the ground to the eaves; hence they are always used the exact length required, without cutting or waste. The foundations of all iron buildings should be of concrete or brickwork, or of both combined. Starting with concrete, which should be not less than 18in. wide, a few courses of 14in. brickwork are laid on it, then a course of two of 9in. brickwork, followed by two courses of stretchers, or 4¼in. work. All the brickwork is carried up flush on the outside, and the "set off" from the 9in. to the 4½in. work takes a 4½in. by 3in. plate, on which the floor joists rest. The superstructure is wood framing, having uprights about 2ft. apart, which are tenoned into a sill; the upper ends carry a plate which takes the roof. Horizontal binders are fixed between the uprights, and the whole framing is stiffened with diagonal bracing—a plan which is necessary to resist wind pressure. The uprights are 2in. thick by 4½in., 5in., or 6in. deep, according to the height of the proposed building; the heads, sills and diagonal braces must be of the same depth. The roof consists of purlins and ridge only, which rest on principal rafters, these latter being tied in at the wall-plate level to prevent undue lateral thrust on the walls. Common rafters are not used for iron roofs. Iron sheets offer little resistance to the passage of heat or cold from the outside to the inside of any building. It is usual, therefore, to cover all the wood framing externally with a layer of thick hair-felt before fixing the sheets. A still better plan would be to cover the framing with rough boarding under the felt. The corrugated sheets are fixed with cone-headed "galvanised" nails and washers; the ridge, eave gutter and down pipes should all be of the same material. The framing inside is covered with boarding ploughed and tongued, and beaded or V-jointed as may be preferred. The flooring is also ploughed and tongued. An iron building should not be painted for twelve months after it is erected, and the painting should be renewed every three years.

Preservation.

As a pound of paint will go much farther on iron than on wood or brick, painting an iron building is a cheap way of adding to its durability. It is not wise to purchase a second-hand iron building for re-erection, because the sheets are always more or less damaged in taking down and removal, and when rusting once sets in it proceeds rapidly. Some local authorities refuse to allow wood framing in iron buildings, and it is then necessary to construct the framing of T- and angle-iron. Wooden temporary buildings are framed exactly like those already described, the outside of the walls being lined with weather boarding instead of iron sheets. Ordinary imported weather boards are of inferior quality. One-inch ploughed yellow boarding should be used instead, with properly fitted notched boards at the angles. These buildings are usually roofed with iron sheets or felt; the second named will last for years if it be kept properly tarred and sanded. All wood framing in the walls and roofs of temporary buildings should be well ventilated, and if linoleum or other non-porous floor covering is used it is absolutely necessary that air be freely admitted to the underside of the floor boards and joists. The heating of wood and iron buildings may be effected with stoves standing detached from the walls. Iron flues to carry off smoke should be supported at some distance from the woodwork, and pass to the outside through the iron roofing. Wherever, however, it can be conveniently done, all fireplaces and flues should be built in brickwork.

The Bank at Windermere illustrated on this page has just been completed for the Lancaster Banking Co. It is built of the local slate, stone, shoddy and freestone dressings. In the banking room all the doors are of oak, relieved with mahogany, and an oak dado runs round this room; the walls are broken up with pilasters having carved caps, &c. The work has been done by local men, except the lead glazing and the faïence dadoing; the former is by Messrs. Shrigley & Hunt, of Lancaster, and the latter by the Opalite Company, of Manchester. The architect was Mr. Robert Walker, F.R.I.B.A., of Windermere.

NEW YORK IMPROVEMENTS.

THE STUPENDOUS EXPENDITURE.

LONDON is undergoing such great changes at the present time that it is interesting to note what other cities are doing. According to the New York "Sun" no other city is improving itself at the rate of New York. Tunnels, bridges, reservoirs, public buildings, new drives and new parks are in hand the total cost of which is literally stupendous. Many of the largest projects are being rapidly pushed to completion.

The £7,000,000 rapid-transit subway from the post-office to Kingsbridge and Bronx Park has now been in process of construction for about a year, and one-fifth of the work on it is completed. The probabilities are that the entire subway will be finished by the autumn of 1903, and that trains will be running in it by the following Christmas, nearly a year ahead of the contract time. Next comes the £1,600,000 Brooklyn tunnel, which is to run from the post-office terminus in the subway to the Battery and under the East River to Flatbush Avenue. Plans are now being drawn and soundings are being made. The contract will probably be let before Christmas, and in less than three years the tunnel may be completed. Under the North River there is already a tunnel, more than half complete, on which millions have been spent. It runs from the foot of Morton Street to Fifteenth Street, Jersey City, and less than a quarter of a mile of it remains to be excavated. But several companies have gone into bankruptcy over the project, and it waits, its workings full of mud and water for the last ten years, for new hands to finish it. There is one other tunnel project, newer than all the rest, but one which the next five years is likely to see carried out. Long Island Railroad interests have just incorporated a £200,000 company to construct an underground railway four miles long, to pass under the East River and connect the Long Island terminus in Long Island City with a point in Manhattan south of Fiftieth Street and west of Broadway.

After tunnels, bridges. The new East River Bridge from Delancey Street to Brooklyn may be finished within a year or so. The towers on both sides are complete now, the preliminary cables are up, and the contractor is making the wire for the big cables. After that the approaches have to be built. It will be two years perhaps before these are in shape, and the city will have another great enterprise complete. The cost is about £3,000,000. Less than two miles above, soundings are being taken for the £1,600,000 cantilever bridge from Sixty-second Street to Blackwell's Island, and thence to Astoria. The plans have been drawn and are now awaiting the approval of the War Department. The bridge may be completed within five years. A third East River bridge, known as yet only as East River Bridge No. 3, is in contemplation. Like the present Brooklyn Bridge, it is to be of the suspension variety. The minimum cost will be £2,000,000. There are two bridges in contemplation across the North River, though both projects are somewhat in the air at present. Plans for the North River Bridge from Fifty-ninth Street to Weehawken have been drawn, and the War Department has approved them. The project is dormant because Governor Odell vetoed the Bill which gave over West Street as far south as the Battery to the bridge company for an approach. Whether the company will revive the plan in another form or will offer new terms it is not known: £12,000,000 has been estimated as the cost of this enterprise.

Nearest to completion of all the city's building projects is its new prison on the site of the old Tombs, on which work has been going on for nearly four years. The prison is being built in two wings, each wing as large as the old jail. The first is almost finished. A few cells in it are already occupied, in fact. It will be fully occupied in a few months, and then the old jail can be torn down and the second wing built on its site. £100,000 has been spent on the first part of the work.

The walls of the new Hall of Records, which the city is building on the ground bounded by Centre, Chambers and Duane Streets, are built up to the second storey. In the matter of new buildings this is the most costly improvement New York now has on its hands. It is to cost more than £845,000.

The foundations for the Public Library in Bryant Park, the city's other costly new building, are ready, and a short time ago the contract for the superstructure was accepted. The entire structure will cost £700,000. It will be built of marble throughout.

Up on Morningside Heights another new structure of a semi-public character is being constructed which at no very distant date will be one of the city's show-places. This is the Protestant Episcopal Cathedral of St. John the Divine. It is being built in sections, the chancel first; and the crypt and the great chancel arch only have been completed so far. No real estimate of the cost of it all has been made. Nearly £200,000 have already been expended, and much more will be required.

In the same district also many millions are being spent on new buildings. The new Columbia University, just off the heights, is only the first link in a remarkable chain of institutions of learning. The new college of the city of New York will come next. The Manhattan College is a little west of that. Across the river and the valley is the New York University, carrying the line along to Fordham, where the picturesque St. John's College ends it.

In the Bronx the city is spending its millions lavishly. On the site of old Jerome Park five thousand workmen have been toiling for the last three years on the new Jerome Park Reservoir, now more than half complete, which is to supply the entire upper half of the city with water. Nearly £3,000,000 are being spent there in the construction of a vast retaining-basin.

Thirty miles above, and forming part of the same water-system, more millions are being spent on the huge Cornell Dam. Years have been spent on this immense mass of masonry, which at the base is 100ft. wide, and it is now nearing completion. When it is built it will take five years more to fill the basin it encloses. Then, where now are farms and villages, there will be an immense inland sea of 4,000,000,000 gals. of water for the city's reserve-supply. Trees and green fields will be buried 50ft. below the surface.

That is outside the city line. Inside, a bridge costing more than £100,000 is nearly built, spanning the Harlem River from 145th Street, Manhattan, to 149th Street, The Bronx. Another, equally costly, is being erected from Willis to First Avenue. Both will be finished by winter.

In Bronx Park the city is helping to construct the most complete zoological garden in America. A space of more than 260 acres has been turned over to the New York Zoological Society, which has already a great collection there housed in the best buildings that can be devised for the purpose. A great court of honour, surrounded by fine buildings, is planned. The whole scheme is the most ambitious of its kind ever conceived.

The small-park system begun in Tweed's time is being carried into effect throughout the city at an enormous cost. Seward Park, one new breathing-place of this kind, is just open adjoining Rutgers Street on the east side and another park in Little Italy (costing £1,000,000), now the most crowded tenement quarter, is nearly ready. The park scheme contemplates a score more such gardens for the poor.

The great viaduct extending from Riverside Drive northward to the Boulevard Lafayette is complete. It spans the Manhattan Valley with great steel arches as high as Brooklyn Bridge. From it there is the finest view in the city. A dozen blocks below a smaller viaduct, nearly complete, levels the beautiful drive and carries it over Ninety-sixth Street, in order that heavy trucks going to the dock at the river-front may not interfere with the pleasure of those who ride or drive by.

Soon the Soldiers' and Sailors' Memorial, a monument which has cost £50,000, will beautify Riverside Drive at Eighty-ninth Street. Years have been spent in the attempt to find the best site for it. It is in the form of a temple. The inscriptions on it are about to be cut, and in the coming autumn it will probably be opened.

Another great drive, a £2,400,000 concourse, is planned for the Bronx. Surveys have been made for it, and its turn for construction will probably come next in the line of the northern improvements. So far it has been too expensive a luxury for the city to acquire.

The Museum of Natural History is still another great enterprise which time will develop. It is a handsome building now, though only that part of it forming the Seventy-seventh Street front has been completed. The plan in it entirety is for a great collection of buildings covering five city blocks. The cost will be £2,600,000 at least.

The city has so far spent only a few million dollars on its great dock improvement, and it has constructed six piers only, those between Bloomfield Street and West Eleventh Street on the North River. These new piers will be extended up to Twenty-third Street as soon as the city can afford it and the work can be done. The cost will be enormous, but the growing commerce of the port will pay for it.

At Bowling Green a site has been cleared for the new Custom-house, and the foundations are being dug. The cost will be nearly £400,000, and it will be finished in little more than a year.

The Chamber of Commerce is spending £300,000 on its new home in Liberty Street. That, too, will be a handsome addition to the financial district of the city. The site is now almost ready, and the building will be open in a year.

The improvements in asphalted streets, in street-car transportation, in small parks and in private buildings that are being made annually are enormous. There are still 100 miles of horse-car line within the city limits, but these will not remain long. It is all improving the metropolis on a scale and at a rapid pace not equalled anywhere else in the world. Ten years hence New York will be transformed.

A NEW LONDON PRINTING WORKS.

A LARGE building has just been erected, to be known as Norwich House, from the designs of Mr. Alfred Conder, F.R.I.B.A., of Palace Chambers, Westminster, on the south side of Norwich Street, near Fetter Lane. It is an extension of Messrs. W. Speaight & Sons' printing works, which have been carried on for many years at 98 and 99, Fetter Lane. The premises communicate by an opening in the party-wall on the lowest storey. The front of the building is of Portland stone relieved by red bricks, Burmantoft glazed bricks being used for the lower part. The lower ground floor is entirely devoted to the purposes of a machine-room, and has a fireproof floor over. It measures about 61ft. by 56ft., and is 16ft. 6in. in height. The walls are built of white glazed bricks, except at the lower part, where brown glazed bricks are used. The floor is of concrete, and finished with granolithic paving. The staircase, to meet the fire rules of the London County Council, is enclosed with brickwork, and the steps are of concrete, finished with granolithic paving and Doulton treads. The walls of the lavatories on all the floors are covered with white glass tiles. Motive power is provided by a tandem compound steam-engine, with the Cerliss gear of 95 h.p. A dynamo, erected on a platform above and driven by the engine, generates current for the motors, which propel nearly all the printing machinery and other plant in the building. Electric light is installed throughout the building, arc incandescent lamps being used for the lower floor and incandescent lamps for the remainder. On the ground floor is the publication department which is a large, spacious and well-lighted room, having offices cut off by glazed partitions, whilst it is approached by a wide entrance faced with glazed brickwork. Narrow maple flooring, secret nailed to allow for the even wearing of the surface, has been used throughout the building. The first three floors are arranged for the composing, reading and other departments. The stereotyping foundry occupies the whole of the top floor, electricity being the motive power for all the appliances. A lift communicates with all floors, from the machine-room to the stereotyping-room, and is propelled by electric current, the motor being placed in a separate room immediately over the well of the lift. Mr. Henry Young, of Junction Works, Herne Hill, is the builder; and the electrical work has been carried out by Messrs. George Forrest & Son, Messrs. Delby and Williamson being the consulting engineers.

TENDERING IN FRANCE.

"THE French law in regard to making tenders for contracts has some features which may afford useful hints to architects and others in this country," says the "American Architect." "As every architect and contractor knows, there is here no uniform practice whatever. Some years ago an unfortunate architect who had asked for competitive bids on behalf of a client was sued by one of the unsuccessful bidders for compensation for estimating, and through the medium of an intelligent jury was compelled to pay a round sum. Certain contractors saw in this occurrence a new source of profit, and allowed it to be understood that they would ask for payment for their time devoted to estimating in certain contingencies beyond the architect's control. As the effect of this announcement was to exclude permanently from architects' offices all the contractors who participated in it or sympathised with it, the others found it best to go on in the old way, notwithstanding the occasional disappointments which they suffered in consequence. Under the French law the contractor is much better protected than with us, while the architect instead of receiving, as with us, the blows which the owner and contractor aim at each other, is assigned his proper place as the arbitrator, not the principal, in their misunderstandings. In general, estimating is a more formal affair in France than here. The bids are really instead of nominally sealed, and are addresed, as they always should be, to the owner as one of the parties to the contract which is to be entered into. Of course, as with us, they are submitted to the architect to see whether the conditions required by the specification have been complied with in the bids, but the owner is always the one to whom they are consigned for final decision. Under the French law, if an owner either directly or through his architect invites bids for a construction without expressly reserving the right to reject any of the bids he must make a contract with one of the bidders or pay reasonable damages. The owner may, however, at any time before opening the bids give notice that his carrying out of the proposed work is conditional on his being able to contract for it at or under a given sum; and, in this case, if all the bids exceed the stipulated sum he is not bound to accept any of them or to pay damages to anyone."

A COVENTRY BRICKWORKS.

AMONGST the industries of Coventry brick-making occupies a more important position than is generally recognised. What was a small brickyard on the Stoney Stanton Road has developed during the past five years into one of the most extensive works of its kinds in the Midlands. From 170 to 180 hands are employed at Webster's Brickworks. The plant is of modern construction, and a railway three-quarters of a mile in length connects the works with the London and North Western line near Foleshill Station. This railway is in itself a considerable enterprise, and is apparently destined to largely effect the carrying of material to a wharf and sidings for which there is ample room for extension close to the Stoney Stanton Road. The raw material is brought up from the clay pits in trolleys running on metals and drawn by an endless chain to the mills where it is ground and mixed and prepared for the moulding machinery. Thus with very little interference from the time the crude clay is pitched into the mill, a constant stream of bricks ready for the kiln is produced. There is a great demand for pressed bricks. How different is the process of the easy running machinery to that of the old-fashioned toiler in the brickyard laboriously pounding away to get his material into plastic condition and to pass it through the mould, working in wet and discomfort, an object only distinguishable by movement from the clay he was handling! The introduction of machinery requiring careful attention and the rapid handling of the produced article has evolved a different type of workman. The popular notion that any man, provided he is strong enough, will do for a brickyard is like so many other general ideas, decidedly wrong. The amount of work that can be spoiled by unskilled handling is something appalling.

If great improvements have been made in the fashioning of the clay, still greater advances may be claimed for the method of drying or baking them. While the ancients sun-dried their bricks 4,000 years ago, the Romans when they came to this country brought with them the knowledge of the process of baking in kilns. The primitive form of kiln is still to be seen in operation in some parts of the country, but beside the immense patent kilns of the up-to-date brickworks they are very puny and laborious constructions. The modern kiln, with its catacomb-like chambers, is fired from the top with numerous channels. At one end the interior of the kiln is a mass of intense heat, gradually cooling down along its length, until at the other end the chambers can be opened and the finished goods taken out. The capacity of these kilns will take 17,000 bricks, and to work the chambers out from one end to the other occupies a month. There are five such kilns upon the works under notice. Bricks, chimneypots, ridges, quarries, and various kinds of plain and decorated productions of the ceramic art are all burnt in these kilns. The colour almost entirely depends upon the amount of iron contained in the clay; as the percentage of iron increases, so the colour deepens from cream or buff to yellowish and dark red.

LONDON TEN YEARS HENCE.

MR. HUGH B. PHILPOTT contributes an interesting article on "The London of Ten Years Hence" to the current number of the "Pall Mall Magazine," illustrated by several excellent sketches by Mr. Hedley Fitton. In the course of the article Mr. Philpott says:—

Let us imagine the case of a London citizen who knows his London fairly well, and is interested in it—a somewhat exceptional person, it must be admitted—and who, after an absence of about ten years, returns to town, say, in the spring of 1911. What are the most striking changes he is likely to observe in the streets and buildings? Imagine him arriving at Victoria Station and setting out on a journey eastwards through some of the principal streets. . . . Passing down Victoria Street, a thoroughfare which has not greatly altered its familiar and rather gloomy aspect, he first turns to the right into Ashley Gardens to see what progress has been made with the great Roman Catholic cathedral, the construction of which had already been well advanced before he left London. It is a curious site for so important a building as a cathedral, but it is characteristic of London that its great public buildings are often situated anywhere but where they might be expected to be found.

The Westminster Cathedral, so far from dominating the neighbourhood, has to be sought with some diligence by the wayfarer unfamiliar with the district. Nevertheless it is in truth not only one of the most important buildings in London, but one of the most interesting modern buildings in Europe. Apart from the interest that attaches to it as a splendid monument to the vitality of a great Church and the devotion of its adherents, it has a special and unique architectural interest as being one of the very few buildings that have been erected within recent years in the Byzantine style. There is, I believe, but one other modern church in Western Europe which is Byzantine in feeling—namely, St. Joseph's, at Antwerp. . . . The building is on a colossal scale: it is 380ft. long by 170ft. broad, and will hold a congregation of about 10,000 people. The campanile, when carried to its full height, will be 300ft. high, and the great arch over the west door is said to be the largest arch over any church door in the world; the tympanum of the arch, which is 27ft. across, will be filled with mosaic. The doors are to be executed in teak, and covered with bronze plates like the famous doors of St. Mark's, Venice. When we enter the building the impression of vastness is rather enhanced than diminished; the height inside in 120ft., and the building is so planned that a very large proportion of the congregation can have an uninterrupted view of the high altar. No stained glass is to be used, and the interior on a bright day, when the white light streams through the clear glass windows on the many-tinted marbles and mosaics, will be a spectacle of almost unexampled splendour. The marble columns which support the vaulting of the aisles and galleries on either side of the nave and the arches of the transept are a very beautiful feature. They are twenty-nine in number, and each is formed of a single block of marble, often of very beautiful colour and figure. Their bases are of Norwegian granite, and the capitals are of white Carrara marble, elaborately carved, and each differing in design from every other.

This vast undertaking, the greatest material creation of the Roman Catholic Church in England since the Reformation, was projected many years ago. It is now nearly thirty years since the first design was produced; this was by Henry Clutton, and was for a French Gothic cathedral. The architect of the present cathedral is Mr. J. F. Bentley, who has long been a close student of the architecture of the East, and has been impressed by the possibilities of the hitherto neglected Byzantine style for modern church buildings. . . . After inspecting the Westminster Cathedral our traveller continues his journey along Victoria Street, passes Westminster Abbey, and reaches the corner of Parliament Street. Here his attention will be at once arrested by a stately pile of buildings standing on what is now a cleared area, but was until recently occupied by a block of rather mean buildings and shops. The buildings in question are the new Government Offices, which are being erected from the designs of the late Mr. J. M. Brydon. When the scheme is fully carried out the block will extend from Parliament Street right back to St. James's Park. Dignified and imposing though it be, the building itself will not, perhaps, arouse very great interest. Its main elevations are, in truth, a trifle commonplace; perhaps the architect has been limited by the necessity of making his building harmonise with its next-door neighbour, the not very beautiful Home Office of Sir Gilbert Scott. But what is like to strike the observer very forcibly is the splendid improvement which the erection of this block makes in the general appearance of this historic corner of the Metropolis. . . . . Passing along Parliament Street into Whitehall, the visitor of a few years hence will notice that another great change has been made. Adjoining the famous Banqueting Hall of Inigo Jones, now used as the Royal United Service Museum, and facing the Horse Guards, will stand the new War Office—another stately and impressive pile. It was designed by Mr. William Young, an architect of rare ability and charming personality, who, unhappily, like Mr. Brydon, has not lived to see his plans carried out. It is a strangely irregular site on which the War Office is to be built . . . . but the observer of the completed structure is more likely to be impressed with the fine effect of the facade to Whitehall than with the fact that the four sides of the building are of unequal length and only one of its angles is a right angle.

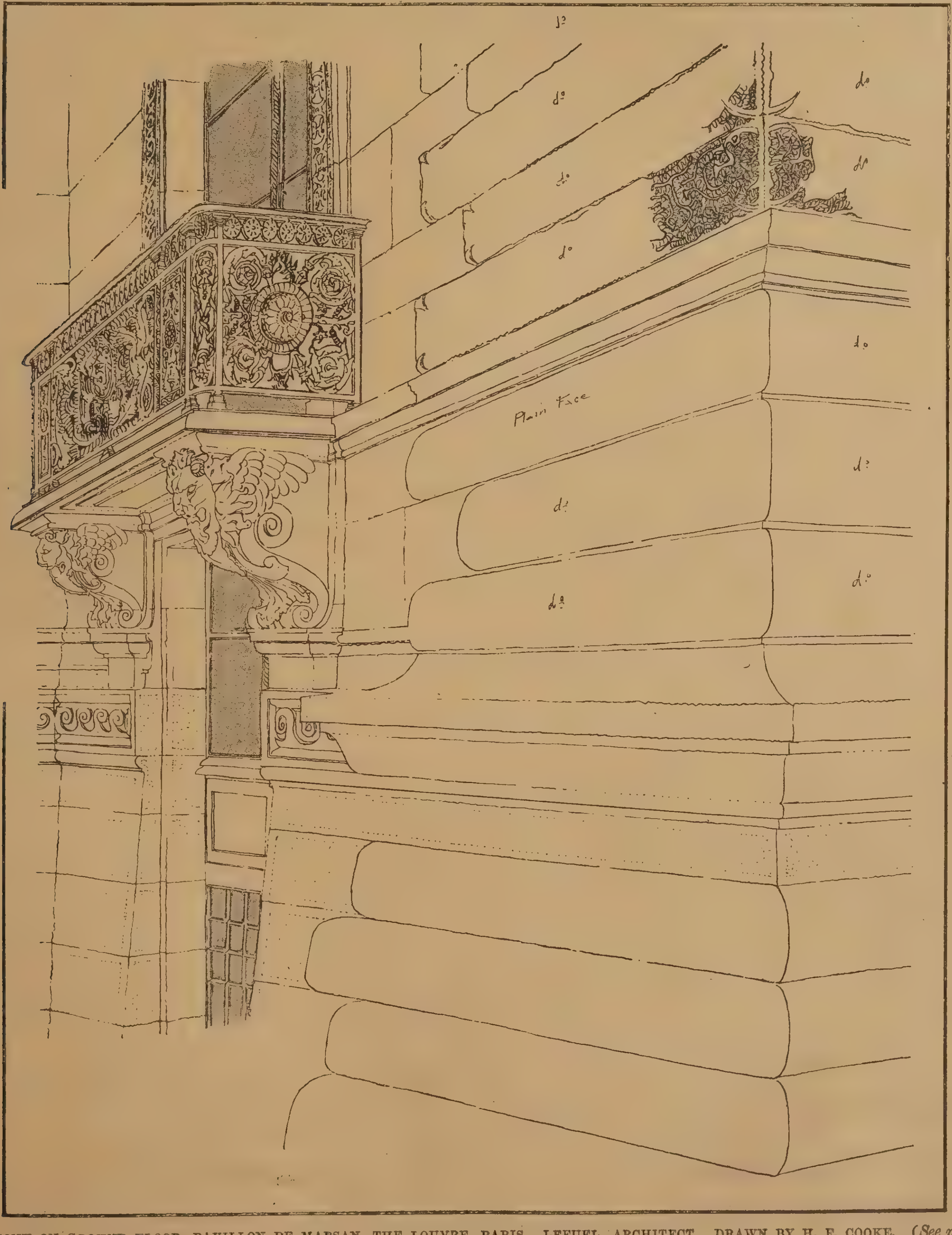
If the visitor now turns aside for a moment into St. James's Park, he will see that during his absence the buildings devoted to the Admiralty have undergone extensive enlargement; but as the new blocks have neither dignity nor beauty, being virtually reproductions of the unsightly red brick and stone structure at present standing, little time need be spent in their contemplation, and the visitor will do well to return to Whitehall and take another look at what will have become one of the finest thoroughfares in London—it would scarcely be an exaggeration to say one of the finest in Europe. . . . . Continuing his journey eastwards along the Strand, the visitor by the time he reaches Wellington Street finds himself face to face with an entirely unfamiliar prospect. . . . . He has now reached the outskirts of the greatest street improvement that has taken place in London since the rebuilding of the city after the Great Fire. Before him stretches a fine broad thoroughfare (nowhere between Wellington Street and St. Clement Danes Church is it less than 100ft. broad), flanked on the right by Somerset House and on the left by handsome new shops and offices and a new Gaiety Theatre and Restaurant. To the left stretches away a crescent-shaped street—an entirely new thoroughfare—which is also 100ft. broad, and is flanked by buildings of dignified and substantial appearance, arranged with a symmetry and order to which our London streets are too little accustomed. The beautiful church of St. Mary-le-Stand, no longer hemmed in by houses on its northern side, stands out in the middle of the widened Strand with a new grace and dignity; and in the distance beyond—more clearly seen than of yore—rise the beautiful tower of St. Clement Danes and the graceful *flèche* of the Law Courts.

Continuing his search for the chief objects of interest in the new London, the visitor of the future may leave the new street at the point where it enters High Holborn, just by the Holborn Restaurant, and proceed eastwards along Holborn to the corner of Newgate Street and Old Bailey. On his way he may note on his left hand the new buildings of the Prudential Insurance Company, a reddish brown mass standing out with striking effect amidst its drab and grey surroundings, and on his right the new Birkbeck Bank. . . . .

Arrived in Old Bailey, he will find himself in the presence of another of the great architectural transformations that will mark the opening years of this century. In place of the famous old prison of Newgate, which is to be pulled down, will stand a stately domed building—the new Sessions House of the City of London.

The decision to build the new Sessions House on this particular spot is one which may have been necessitated by circumstances, but it is nevertheless to be regretted. For it means the disappearance not only of an ancient and historic landmark, but of one of the few thoroughly characteristic and satisfactory buildings of the Metropolis. Newgate is not beautiful as a palace is beautiful; were it so, it would be an architectural failure. But its grim and rugged outline proclaims its purpose—it suggests a prison to the least imaginative observer; and it has stood for more than a century as a material embodiment of the sternness, strength and dignity that are characteristics of civilised law. There is also a serious practical objection to this site—namely, that on it the new building cannot possibly be displayed to advantage. Like another building devoted to the administration of justice, the Law Courts in the Strand, it will inevitably suffer in appearance from the lack of a commanding site.

To continue further eastwards, the search for new objects of architectural interest might, perhaps, result in some disappointment. For although it is possible that the changes in the city east of St. Paul's will be not less considerable than those in the west, they are not likely to be of the same monumental character.



BALCONY ON GROUND FLOOR, PAVILLON DE MARSAN, THE LOUVRE, PARIS. LEFUEL, ARCHITECT. DRAWN BY H. F. COOKE. (*See p.* 22.)

There is no locality in London which gives promise of experiencing a more striking development in an architectural sense during the next few years than South Kensington, and a visit there in 1911 cannot but be an interesting experience. The character of the neighbourhood has for a considerable time been undergoing a change; and Thackeray, who lived in Young Street about the middle of last century, would hardly recognise in the Kensington of to-day, with its innumerable blocks of "mansion flats," the quiet old Court suburb that he knew. The visitor of the future, however, is less likely to be impressed by the increasing number of these Babel-like structures than by the fact that three more have been added to the already considerable number of fine public buildings in this favoured locality. Two of these, the Victoria and Albert Museum and the Royal College of Science, are buildings of the first importance, and in both cases the work of preparing the foundations is now proceeding vigorously. The third, the Royal School of Art Needlework, a building of some pretensions in the Imperial Institute Read, is much further advanced towards completion.

The observer of the changes which the first decade of the new century has wrought on the face of the city will not fail to take note of the greatest of all London's highways, the Thames. . . . . A new bridge at Vauxhall is now in process of construction, and another is to be built at Lambeth. The Vauxhall Bridge has been designed by Sir A. Binnie, late chief engineer to the London County Council, and is to be built of concrete, all the exposed surfaces except under the arches being faced with the whitest granite obtainable. From Lambeth Bridge to the Houses of Parliament the journey will be made by a broad new thoroughfare so planned as to give a fine approach to the Houses of Parliament. The Victoria Tower Gardens are to be extended right away to the foot of Lambeth Bridge, and the river embankment is to be continued, thus practically completing it from Blackfriars to Chelsea. The whole of the space now occupied by wharfage, and even some part over which the river now flows, will be added to the gardens, as the new embankment wall will be set out to the level of the existing one. . . . .

A little higher up the river, at Kew, a third new bridge will span the Thames. It has been designed by Sir J. Wolfe Barry, and is to be built of granite. It replaces a very picturesque, but very narrow and unserviceable, structure which has stood for more than a hundred years. The old bridge was only 24ft. between the parapets; the new one will be 55ft. There is a probability also that at some future time yet another bridge will be built in the city, somewhere between Blackfriars and Waterloo Bridges, to carry on the line of the Holborn-Strand street to the south of London. That, however, is an improvement which probably belongs to a more distant future than the time with which we are now concerned.

Masters and Men.

A Strike of Masons at Bridgend has occurred for an increase of ½d. per hour and acceptance by the masters of a code of regulations issued by the Masons' Society. As there are very few society men in the town, the masters feel confident that they will have no difficulty in filling the places left vacant by the action of the Masons' Union, and are determined to maintain their resistance.

The Hull Slaters and Tilers have come out on strike against the determination of the masters to employ labourers to do slaters' work. The employers have issued a statement to the effect that labourers are not employed by Hull slaters, and that the masters had no intention at any time to employ unskilled labour on slaters' work. It has been decided to close all the yards for a week for the purpose of receiving applications from old hands, and if the latter do not apply the employers will consider themselves free to fill up vacancies.

The Strike of Swansea Builders' Labourers is still going on. A conference was held recently, when the men offered to return to work at the old rate providing they receive a farthing advance per hour in November next and another farthing in May. The meeting stood adjourned, the masters promising to consider the offer. The masters now fully believe that resistance is only a question of time, and are advertising for men to fill the vacant places. The men do not see their way to concede everything after a seventeen weeks' strike, and the deadlock is thus being prolonged. So far as can be seen, however, it can only end in one way, as the men have been deserted by the skilled workers.

Dundee Masons.—An important agreement, affording a promise of industrial harmony in the Dundee building trade has been entered into between the masters and operative masons of the city. This section of the building trade has within recent times suffered from strikes and petty disputes involving a good deal of friction between employers and employees. The agreement referred to—the terms of which have now been accepted by both parties—provides that for a year, that is to say as from June last, no reduction will be made in wages. Having regard to the present position and prospects of the trade this provision has proved specially acceptable to the operatives. The interests of the masters are safe-guarded by a clause which will have the effect of prohibiting the calling out of men from the jobs of employers whose policy and actions do not coincide with the views of the union officials. Probably the most important feature of the agreement is a proviso for the appointment of an arbiter mutually chosen, whose decision in all matters of dispute will be binding on the signatories to the agreement.

The Dispute in the Bradford Building Trades has now extended over sixteen weeks, and the prospects of any settlement appear to be as remote as they were when matters were brought to a crisis on May 1st. Both employers and workmen are as firm in their attitude as ever, and to this extent the position of affairs may be said to remain unchanged, but in another aspect the situation can scarcely be described as so acute as it was in the earlier stages of the difficulty, from the point of view of either side. For some time past there has been a steady importation of non-society labour, until now, so far from building operations in the city being practically at a standstill, as was the case for some months, workmen officially stated yesterday to number two or three hundreds are engaged on several of the largest building undertakings. These include the Cartwright Memorial Hall, the Green Lane Board schools, the electricity extension works and the new Conditioning House. Mr. W. A. Forshaw, who has charge of the new labour bureau, reports that day by day a satisfactory number of applications are received, and that the new workmen are started as soon as their credentials are verified. He hazards the opinion that if the present rate of applications is continued the places of the trade unionists will have been entirely filled up in the course of another month or so. On May 1st the number of carpenters and joiners thrown out of employment was about 400, and the policy pursued has reduced the number on the books to 200. Similarly as to the masons the number on the books of the Bradford branch has diminished from about 500 to just over 300. It is stated that there is considerable activity in the building trade generally, and that in the great majority of cases the men have no difficulty in obtaining as much as 10½d. an hour, which of course is a penny an hour higher than the rate of wages upon which issue has been joined in Bradford. Some indignation has been aroused in the union by an assertion that its members are receiving a larger weekly allowance than their wages would ordinarily average in the course of a year. The allowance at the commencement of the dispute was 14s.; afterwards it was increased to 15s., and now so much support is forthcoming from other branches in sympathy with the Bradford men that the pay has been increased to 24s. a week, beyond which it is not likely to advance, however large the funds at disposal.

Street Improvements at Aigburth formed the subject of a Local Government Board enquiry into an application by the Garston Urban District Council for sanction to borrow £1,785.

Law Cases.

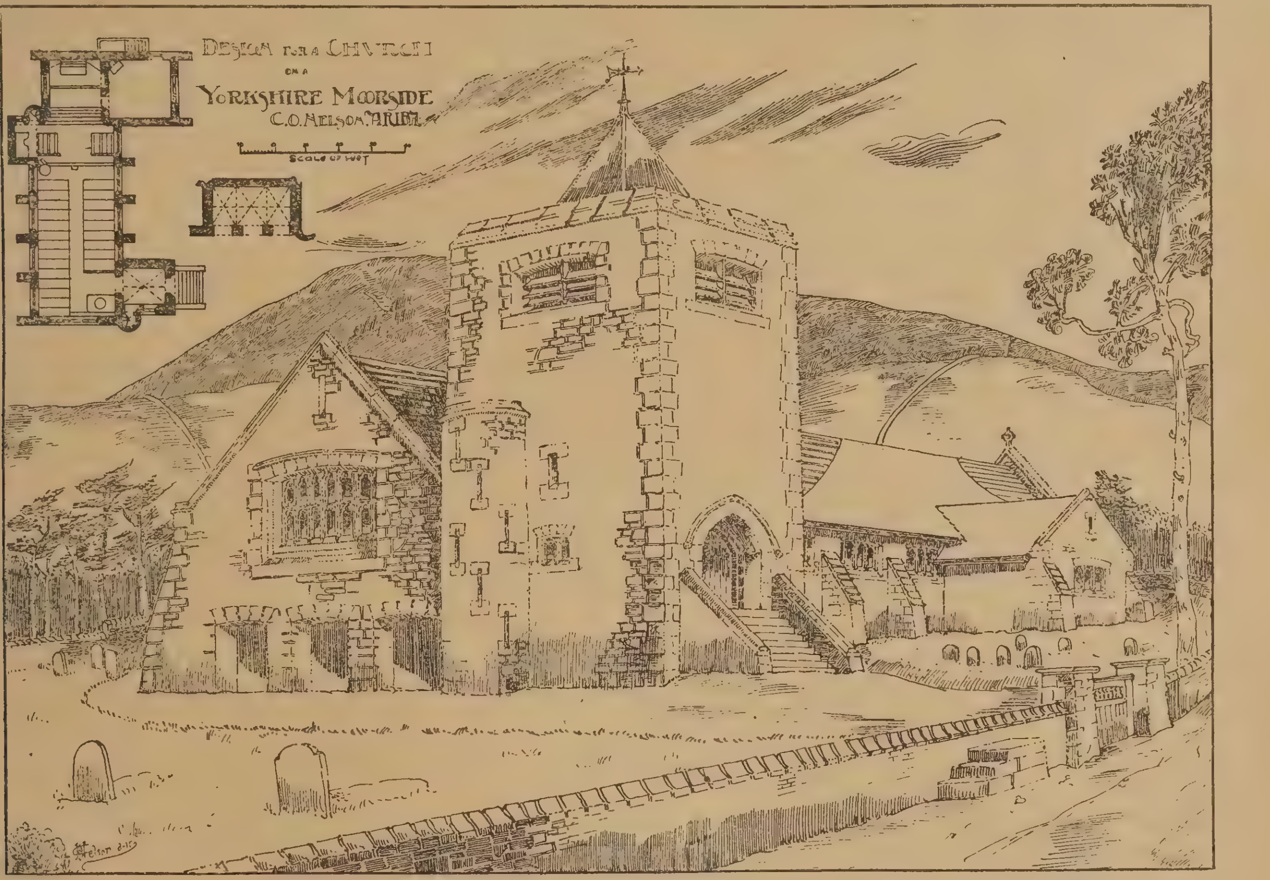
The Woking Drainage Scheme.—Mr. Herbert Weldon, public works contractor, of Birmingham, has just concluded a big drainage scheme at Woking, Surrey. The contract price for the work was £44,365, but before the scheme was finished the cost had run up to nearly £90,000. After concluding the contract Mr. Weldon made a claim of £10,000 against the Woking Urban Council for extra works performed, and the matter was referred to arbitration before Messrs. Taylor, Sons & Santo Crimp, of Great George Street, Westminster, the engineers. Mr. Weldon gave evidence in support of his claim. He said he had held an appointment under the Indian Government, and had had large experience in managing contracts for other people, finally starting for himself in 1892. During the three years he was working for other people he superintended £50,000 worth of work for the North-Western Railway Company, while since he had been on his own account he had done work of all classes amounting to nearly £500,000. Mr. Clement B. Ferry, who was Mr. Weldon's resident engineer at Woking, also gave evidence, and was subjected to cross-examination by Mr. Bray, K.C. The proceedings stood adjourned over the Long Vacation, but at a recent meeting of the Woking Urban Council a letter was read from Mr. Weldon's counsel suggesting a compromise for £2,275 18s. 9d., made up of £1,025 18s. 9d. which the arbitrator stated was due on certificates, and £1,250 which Mr. Weldon agreed to accept in settlement of his claim. The Council accepted the compromise. It was stated that the costs of the arbitration on both sides amounted to £100 a day.

The Building of a Cottage.—At the Chepstow County Court recently Judge Owen had before him an action remitted from the High Court brought by George Howell, a builder, of Woolaston, against George Robson, of Lydney. Plaintiff sought to recover £65 15s. 5d., balance of an account for building a cottage. Defendant counter-claimed £95, alleging that plaintiff deviated from the plans and also that some of the work was defective. It seemed that certain of the rooms should have been 8ft. 6in. high, but instead of that they were 4in. or 5in. lower; that the floor sloped an inch or two out of the horizontal; that some of the doors were warped and did not fit; and that there were faults with the roof and other parts. After a lengthy hearing his Honour gave judgment for the plaintiff for the amount claimed with costs. On the counter-claim he awarded defendant £10 in respect of the defective work (the estimated cost of making it good) and £25 cost for depreciation of the value of the cottage by reason of the rooms being made so low, with costs on £25.

Embezzlement by a Surveyor.—At the Northampton Divisional Police Court recently George Alfred Norton, until recently surveyor to the Hardingstone Rural District Council, was sent to prison for three months with hard labour for embezzling a small sum of money belonging to the council. The prisoner, who pleaded guilty, said he had been drinking heavily and had lost his wife. He had lost his situation and his character, and had tramped all over the country.

A Result of Speculative Building.—On Thursday last a meeting of creditors was held under the failure of J. J. Weibking, builder and contractor, of St. John's Works, Southgate, and elsewhere. It appears that the debtor, who filed his own petition, had large contracts on hand, one of which was for the erection of properties on the old Wood Green cycle track. The gross liabilities amount to between £40,000 and £50,000, of which £15,000 is unsecured, the assets being estimated to realise a surplus. The debtor attributed his failure to excessive building on insufficient capital, heavy interest on borrowed money, and inability to sell property owing to the war. The chairman pointed out that betting losses also had something to do with it. A committee of three creditors was appointed to investigate the debtor's affairs and report at the meeting to be held on August 30th.

Compensation Claim against the L.C.C. for Compulsory Purchase of Land in Westminster.—At the Westminster Guildhall on Wednesday last Mr. John Troutbeck and a special jury had before them the case of *Adams' Trustees* v. *The London County Council*, which was a claim for compensation for the compulsory acquisition of land in St. Anne's Street, Westminster, required for the extension of the council's gas-meter testing station. Mr. Freeman (for the claimants) said the premises had a total area of 6,100ft., and what was an important point was the fact that the site was not dominated by any ancient lights. The lease had 21½ years to run, and the jury would have to ascertain what was the present value of that unexpired term. Worked out on the usual scale, it would yield £699, and then they would have to take into account the value of the reversion. Several experts who had been consulted valued the 6,100ft. area at £5,970, to which should be added the 10 per cent. allowed for compulsory sale. Mr. William Henry Southon, a surveyor, of Cockspur Street, Charing Cross, said he considered the claimants were entitled to £7,336. Mr. Boyle (for the council) submitted, however, that the land was worth only £2,500 or £2,600. Mr. Samuel Walker, of Moorgate Street, a surveyor, said he considered the land and buildings on reversion were worth £250 per annum, of which he would give seven years' purchase. That would produce £1,750, to which had to be added £663, the present rental value, and 10 per cent. for compulsory sale, which would give them a total of £2,654. He considered that the full value. Mr. James Frederick Field, another surveyor, agreed with Mr. Walker's figures, which worked out at 10d. per ft. for the land and buildings. The jury awarded claimants £5,500, including everything.



Examination of St. Bride's Steeple.—The steeple of St. Bride's Church, Fleet Street, was recently examined by a steeplejack, on whose report the parish authorities decided that a thorough investigation should be made; its present condition is, however, in no way due to tubular excavation, but to the wear of time. The steeple is one of Wren's most graceful achievements. Originally it rose to the height of 234ft. In 1764 it was struck by lightning, with the consequence that the "soaring pile" had to be rebuilt to the extent of 83ft. Now it is about 5ft. higher than the famous steeple of St. Mary-le-Bow. The height of the tower to the top of the parapet is 120ft., and the spire rises in four octagonal storeys, of which the two towers are Tuscan, the third Ionic and the fourth Composite, the masonry culminating in an obelisk and vane.

A NOTTINGHAM FOUNDRY.

On the stretch of meadow land bounded by Meadow Lane, Nottingham, and the two Midland lines to Melton and Lincoln a new foundry works are being erected for the Midland Engineering Co., in consequence of their old works in Queen's Road being wanted by the Midland Railway Co. The building of the new establishment in Meadow Lane commenced last October. Three out of the eight acres of land which the company have at their disposal are to be built upon, the plans of Mr. W. B. Starr, the architect, providing for two main and several minor buildings. One of these big buildings—what is known as the large foundry—is now practically completed and is 200yds. long, 43yds. wide and 50ft. in height. Electrical cranes run along the huge girders near the roof; casting pits have been hollowed out the floor. Flanking this long foundry and in the same block of buildings are fitting shops, a gully foundry, an engine-room with two engines of 45 h.p. and 20 h.p. respectively, and a room containing the dynamos for the electric light. Light is obtained from expansive windows in the roof. Across the line of rails which connects the works with the Midland Railway, in the direction of Colwick, will be an even larger foundry than this. The contractor is Mr. James Wright, of Wilford Grove, Nottingham. This foundry will be utilised entirely for railway work, such as making plates and chairs and stops and all the other requisites of railway line-laying. The machine shop will be no less than 130ft. sq., though there is to be only one storey. The other departments will include forge shops and a boiler- and engine-house, while there is to be a chimney stack 50ft. high. On the opposite side—the London Road side—of the works will be erected stables and fitting and pattern shops, the total length of the building containing them being 280ft. The entrance gates will of course be on Meadow Lane, and here a frontage to the works 500ft. long will—though nothing has as yet been done with regard to this—contain the offices, the caretaker's house, and also mess- and cooking-rooms for the men engaged in the works. Before Mr. Wright could commence building in earnest the whole ground surface had to be raised by between 4ft. and 5ft.

Keystones.

The Parish Church of Llandenny will be opened, after extensive restoration, early in September.

A New Bridge at Paris similar to the splendid Pont Alexandre is to be erected across the Seine from the Louvre to the foot of Rue Bonaparte. The name proposed is "Pont du Louvre."

Hughenden Manor has been enlarged, the work having occupied between two and three years. Architecturally the mansion is of the Jacobean style, and the added portion has been executed in accordance with the existing fabric.

Harrogate Kursaal.—On page 18 of our last issue it was stated that Mr. Robert J. Beale, A.R.I.B.A., of Westminster, the architect of the new kursaal now being erected at Harrogate, will be responsible for the interior decoration and furnishing of the building. It is Mr. Frank Matcham (the assessor) who will undertake this portion of the work.

A Stained-Glass Window, erected in the collegiate church of Stratford-on-Avon, was unveiled recently. The window commemorates the heroism and sad death of Lieutenant Richard Fordham Flower, who was killed in South Africa.

Brighton's New Market.—The first of the new buildings with which the Markets Committee of the Brighton Town Council intend to replace the old market was opened last week. This is to be known as the Floral Hall, and is intended for the exhibition and sale of flowers and fruit. It is large, lofty and well lighted, and adjoins the present flower and fruit market. It is 145ft. long by 30ft. wide. The entrances are from Market Street and Black Lion Street, and the exterior elevation is in Ruabon terra-cotta, with ornamental curved-glass fronts. The walls are substantially built of red brick, and the glass roof rests upon arched girders resting upon decorated stanchions. The roof is glazed with patent glazing, shaded, and is surmounted with louvres with top lights. The floor is of red tiles. The ironwork is decorated in shades of French grey and the walls in salmon. At the south-east end suitable lavatory accommodation has been provided. The builders of the hall were Messrs. Rowland Brothers, of Horsham, whose tender was for £10,237. The architect was the borough engineer and surveyor, Mr. Francis J. C. May.

New Children's Home at Huddersfield have been erected on a site at Outlane. Mr. J. W. Cocking, of Cloth Hall Street, Huddersfield, was the architect. The cost has been about £2,100.

A New Connexion Church at Bridgtown, Cannock, is being erected on land adjoining the old chapel built in 1865. It will accommodate 500 worshippers, and will cost upwards of £3,000. The architect is Mr. Arthur Harrison, of Birmingham.

Fremiet, the distinguished sculptor, has just finished the model for his magnificent Eagle of Waterloo. He has also finished a fine statue of the Constable du Guesclin, which shows the conqueror of Montford on horseback, laurel-crowned, proud, thick-set, almost brutal-looking, such as history has painted him. This monument in bronze will be erected in Dinan this autumn.

The Buddhist Pagoda at the Paris Exposition and the marvellous subterranean grotto which had so great a success in the Indo-China section of the international show is ordered to be demolished. Artists and admirers of Eastern art had asked that these magnificent specimens of Oriental work should remain as a souvenir and as a manifestation of the artistic work of the men of the Extreme Orient which is daily penetrating into our civilisation.

Carrara Marble.—At Grognano, in the north of Carrara, has been discovered marble of various shades of red, black and gold which will make excellent decorations for hotels or public buildings. It seems that the method of extracting the stone from the quarries of Carrara is most primitive, not a single steam crane being in use. This system is commendable in so far as it means employment for many men, but it tends to keep up the price of marble, which is regretted by the struggling sculptor.

The Roman Camp at Gelligaer: Funds Needed.—Funds are in request to carry on the excavation of the remains of the small Roman camp at Gelligaer, Glamorganshire. The expense has been found greater than was at first anticipated, owing to the site having been crowded with buildings the foundations of which it is desired to explore thoroughly. The work has hitherto been carried out by the archæological section of the Cardiff Naturalists' Society. Contributions may be forwarded to Mr. John Stuart Corbett, president of the section, Castle Street, Cardiff.

A New Lunatic Asylum for Middlesex.—A Local Government Board enquiry was held recently into the application of the Middlesex County Council for the power to borrow the sum of £250,000 for the purposes of the new lunatic asylum which they propose to erect at Napsbury, St. Albans, Herts. The architect is Mr. Rowland Plumbe. There was no opposition to the scheme. Evidence was given to the effect that the asylum, which would be constructed to accommodate a total of 1,150 inmates, was estimated to cost £350,000. The loan of £250,000 for which consent was now asked was on account only of the general building. The site had been already purchased at a cost of about £50,000, and the foundations for the main building were rapidly approaching completion.

Proposed Museum for Fulham.—The Fulham Borough Council are to be asked immediately on reassembling to take into consideration the pressing need of providing a local museum. In consequence of the extensive building operations which are going on in the borough most of the historic buildings have been demolished or are threatened with demolition. From such buildings much might be saved which would form valuable links with the past, and much has already been secured by private enterprise. It is felt, however, that Fulham should follow the example of Chelsea and other boroughs, and secure either by purchase or loan as much as possible in one well ordered museum under municipal control. The matter is made urgent by the fact that the Free Library Committee have now the option of purchase at a mere nominal price of a unique collection of nearly 1,000 prints, drawings, maps, plans, deeds, pamphlets and other miscellanea relating to the parish. This would form an interesting nucleus, and the opportunity to acquire it intact is never likely to occur again.

At Port of Spain, Trinidad, a new church is proposed to be erected by the Roman Catholics.

St. Martin's Lane, W.C.—Some of the houses still standing on the east side are of considerable antiquity. One stated to have been built by Inigo Jones, in which he resided, is now used as a branch of the National Penny Bank.

A New Board School at Cleethorpes is being erected in Bursar Street at a cost of about £10,000. The new school will be a plain building, and is to give accommodation to 950 children—360 boys, 360 girls and 230 infants—while the premises will be capable of extension so as to accommodate 120 more infants if necessary. The architect is Mr. Croft, of Cleethorpes.

Improved Housing in St. Pancras.—Plans have been adopted by the St. Pancras Borough Council for the erection of blocks of industrial dwellings on cleared sites in Brantome Place, Euston Road, and Prospect Place, Gray's Inn Road respectively, providing accommodation for 584 persons, allowing two persons to each room. The total estimated cost of building is £32,367.

A Permanent Ruskin Museum is to be opened at Coniston, Lancs, on the 31st inst. as the result of a successful Ruskin Exhibition held there last summer. It consists of a large well-lighted room in connection with the Coniston Institute, and has been specially built and furnished for the purpose. The contents include numerous interesting and valuable articles contributed by Mr. and Mrs. Arthur Severn, of Brantwood, and by W. G. Collingwood, of Coniston; and the work of getting together and arranging these is being carried out by the latter gentleman, to whose efforts the successful organisation of last year's Ruskin Exhibition was mainly due.

The Northampton General Infirmary is to be practically reconstructed throughout the interior at a cost of £30,000. This was sanctioned at a recent meeting of the governors, when Sir Henry Burdett, the eminent hospital expert, in conjunction with Mr. F. W. Dorman, A.R.I.B.A., drew up a report in which two schemes were submitted. One scheme involved an expenditure of £21,000, and comprised the erection of a new home for nurses apart from the building, and certain additions and alterations. The other scheme which has been adopted is estimated to cost £29,500, and comprises the erection of two new pavilions, the conversion of the present infirmary into a home for nurses, and a rearrangement of some of the officers' quarters—practically a new hospital.

Mr. James Hutton, aged forty-nine years, a well-known Dundee architect, met his death recently at Montrose from drowning while out swimming. The deceased gentleman was born and brought up in Dundee, and served his apprenticeship as an architect in the office of Mr. William Mackison, burgh engineer, to whom he afterwards acted as assistant. About eighteen years ago he, however, commenced business on his own account, and had since established a wide and prosperous connection. Mr. Hutton was the architect for a number of public buildings in the city and elsewhere, including St. John's United Free Church and the People's Palace. Deceased took little or no interest in public affairs, although he was an enthusiastic member of the Dundee Institute of Architecture, of which body he was for a term president. For some years Mr. Hutton had resided in Invergowrie.

Mr. Robert I. Bennett, architect, of Manchester, died last Wednesday. For many years in partnership with Mr. W. A. Royle, he had been actively engaged in professional work. Thirty-five years ago the firm took over the business of the late Mr. Philip Nunn, an architect who, although young in years, had at the date of his death made a considerable reputation. Both members of the firm were pupils of Mr. Nunn. Mr. Bennett was held in high respect in his profession, and the members of the Manchester Society of Architects some years ago elected him as president. The firm of Royle & Bennett have during their long period of partnership carried out many important buildings in the city and neighbourhood, particularly schools, having erected for the Manchester School Board no less than ten buildings, amongst them the Higher Grade Schools at Cheetham. They also designed the School Board offices in Deansgate.

The Alfred Bevan Memorial Convalescent Home for men, women and children at Sandgate was opened last week. Mr. G. D. Stevenson, A.R.I.B.A., was the architect.

A Large New Residence at Frensham Hill, Rowledge, has been erected by Messrs. A. Estcourt & Son, of Gloucester, from designs from Messrs. Waller & Sons, architects, of the same city.

The Turners at the National Gallery have been rehung, and with good effect. The one or two great pictures which Turner himself hung, so to say, remain in the old position. They are in the French room, just to show, said Turner, how artificial a Claude, for instance, appears in comparison. But the greater number of the Turners have gained in every way by their new setting, and they are seen to more advantage than ever by their now magnified marginal spaces.

Municipal Schemes at Sunderland.—A Local Government Board enquiry was held recently into an application from the Sunderland Corporation to borrow a total sum of £34,920, this being required for three purposes, namely, £20,000 for the purchase of the Victoria Hall and some land adjoining, for the renovation and alteration of the hall and the erection of additional buildings; £3,920 for purposes of electric lighting in various parts of the town; and £11,000 for the reconstruction and extension of the public baths and washhouses in Hendon Road.

New Co-operative Stores are being erected in Durham Road, Birtley, by Mr. John Jopling, of Birtley, from designs prepared by Messrs. Liddle & Browne, of Prudential Buildings, Newcastle. The front of the building is to be of Ruabon red-facing bricks with stone facings, and it will have a frontage of 265ft. and a depth of 133ft. There will be eight shops on the ground floor, and on the first floor a large hall to seat about 900 people. Provision will also be made for club- and committee-rooms, with secretary's and cashier's offices, &c. The whole is to be lighted by electricity, and plant will be laid down for that purpose. The total cost of the new premises is estimated at £20,000.

St. Gregory, Weare, Somersetshire, has been undergoing restoration. Many interesting features have been brought to light in the process, though not so many remains of the Norman period as might have been expected. So far the old font and some zigzag moulding are the only traces of the architecture of that era which had been noted. The removal of the plaster from the walls of the sanctuary brought to light the ancient aumbry and piscina; and on the west side of the chancel arch was found the old doorway to the staircase leading to the rood-loft. Weare Church has suffered greatly in past times through injudicious renovations, and the east window, which is entirely out of character with the prevailing architecture, is to be replaced by one more suitable. Elsewhere arches originally of stone have been patched with brick, and these are being restored. The old oak seats are being remodelled, it is to be hoped in a conservative spirit.

The Century Theatre, which occupies the site of the old Adelphi, has been almost entirely rebuilt for Mr. George Edwardes, who holds a long lease of the house. The auditorium is entirely new, there is plenty of space between the seats, and as the circles are built on the cantilever principle there are no pillars to obstruct the line of sight. The stalls, numbering upwards of 200, are approached direct from the entrance hall. The dress circle has been brought forward, considerably enlarged and seats 170; the upper circle has also been extended and seats 250. The pit and gallery are very commodious, and all seats in these parts of the house have been upholstered. The prevailing scheme of the decorations is ivory white, yellow and old gold developed in silk velvet, with electric blue mural coverings and paintings. An asbestos fireproof curtain has been fitted, the theatre is heated on the low-pressure system and the ventilation has been carefully attended to. There is a complete installation of electric light, with gas as a stand-by. The exits are numerous and symmetrically placed, leading into wide and spacious corridors. The whole scheme of reconstruction has been designed and carried out by Messrs. Ernest Runtz & Co., architects, Mr. Frank Kirk being the contractor.

Mr. William Youings, the well-known statuary, of Bear Street, Barnstaple, died recently at the age of eighty years. He successfully carried on his business for half a century.

The Victoria Memorial Designs will be exhibited to the public in October. The plans were privately exhibited at the Foreign Office some weeks ago. During the interval the sketch model for the monumental group and fountains will be elaborated by Mr. Brock, the sculptor, and Mr. Aston Webb's architectural plans for laying-out the site, so far only seen in drawings, will be reproduced in plaster. If a model of Buckingham Palace and the proposed new roadway circling the garden is added, the public will have a good opportunity of judging what the great memorial will be like when completed.

The Chancel Arch of the Parish Church of Clopton, Suffolk, has until recently had its two stone corbels left in the rough state awaiting the sculptor's chisel. They have now been carved as a memorial to Miss Effie Garrod, youngest daughter of Sir Alfred Garrod. The corbel on the north side represents the Good Shepherd with the traditional lamb and crook and a setting of floriated carving. That on the south side depicts the Good Samaritan ministering to the wounded traveller. The cost of the work has been borne by Sir Alfred Garrod, Physician Extraordinary to Queen Victoria. Some improvements have recently been effected in the interior of the church at the expense of the parishioners.

The New Hospital at Newport (Mon.).—In our issue for August 14th last it was stated that this new hospital was designed by Mr. W. Tanner, and was built by Messrs. D. Richards, Ltd. We now learn that this is inaccurate. The hospital buildings were designed by Mr. Richard J. Lovell, architect, of 47, Queen Victoria Street, E.C., but he resigned in 1898, and his work was continued by Messrs. Pennington & Son, architects, of Hastings House, Norfolk Street, W.C. The building was erected by Messrs. A. S. Morgan & Co., builders and contractors, of 1, Godfrey Road, Newport, Mon., the work having occupied four years. The foundation-stone was laid on August Bank Holiday, 1897, and the buildings were formally opened on August 5th last. The total cost has been about £33,000. Lack of funds very much delayed the completion of the work.

The Memorial to the late Duke of Westminster in the Abbey.—At the present time Messrs. Burlison & Grill's workmen are removing the stained glass from the south end of the transept of Westminster Abbey to make way for the memorial to the late Duke of Westminster. The old work known as the marigold window dates from 1847, and is remarkable for the brilliancy of its colouring. The Duke's memorial will fill all the windows in the south wall of the transept. The design, which was recently exhibited in the Academy, has been supervised by Mr. G. F. Bodley, A.R.A. Great efforts will, if necessary, be made to finish the work before the Coronation. The process is a very tedious one, requiring great care in order to preserve the glass intact. Ordinary clear glass is being substituted, so that the work of putting in the new memorial window may ultimately be undertaken as a whole, and not done piecemeal as the old one is removed.

The Glasgow School Board Classes in Building Construction will open on Monday September 2nd, at the High School, under the direction of Mr. D. Bennet Dobson, architect. An additional feature of these evening classes this season is that students will have the opportunity of studying workshop practice in Kent Road School, as a branch department of the High School, the two classes working in conjunction with one another. The practical department is held on Mondays (advanced) and Tuesdays (elementary), and theoretical instruction is given at the High School, 30, Elmbank Street, Glasgow, on Tuesdays, Wednesdays and Thursdays. The fee for the theoretical is 7s. 6d. for a session of seven months and for the practical 1s. (inclusive of tools and woods) for eight months. Visits of inspection will be arranged to buildings in course of erection and works in progress showing the manufacture of material. Full particulars can be obtained from Mr. G. W. Alexander, 129, Bath Street, Glasgow.

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	11	3		—	
Clover, best	per load	4	5	0	5	10	0
Hay, best	do.	5	0	0	5	10	0
Sainfoin mixture	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	8	7	1	9	9
Colza Oil, English	do.	1	8	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	6	0		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	$4\frac{1}{2}$		—	
Linseed Oil, barrels	do.	1	11	$10\frac{1}{2}$		—	
Petroleum, American	per gal.	0	0	$5\frac{5}{8}$	0	0	$5\frac{3}{4}$
Do. Russian	do.	0	0	$4\frac{7}{8}$		—	
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	16	0	3	18	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	5	6	1	6	0
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	6	6		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	83	0	0		—	
Iron, Staffs., bar	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0	11	10	0
Lead, pig, Spanish	do.	11	12	6		—	
Do. do. English common brands	do.	11	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	15	0
Do. Mild Bars	do.	6	15	0	7	1	0
Tin, Foreign	do.	116	5	0	116	15	0
Do. English ingots	do.	119	0	0		—	
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	17	6	17	5	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	$10\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P.Std.	13	15	0	14	15	0
Do. do. 4th & 3rd	do.	11	0	0	11	15	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd "	do.	19	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	13	0	0	18	0	0
Do. White Sea	do.	11	15	0	13	15	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	do.	18	5	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	5	15	0	10	0	0
Flooring Boards, 1in. prepared, 1st	per square	0	11	6	0	13	6
Do. 2nd	do.	0	8	6		—	
Do. 3rd &c.	do.	0	7	9		—	

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	$4\frac{5}{32}$		—	
Do. Honduras	do.	0	0	$3\frac{3}{4}$		—	
Do. Tobasco	do.	0	0	$3\frac{3}{4}$		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	$3\frac{3}{4}$		—	
Do. African	do.	0	0	$3\frac{1}{8}$		—	
Do. St. Domingo	do.	0	0	$6\frac{3}{8}$		—	
Do. Tobasco	do.	0	0	$3\frac{29}{32}$		—	
Do. Cuba	do.	0	0	$4\frac{29}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American	per cub. ft.	0	3	1		—	

COMING EVENTS.

Thursday, August 29.

SANITARY INSPECTORS' ASSOCIATION.—Autumn Meeting and Dinner, Holborn Restaurant, 9.30 p.m.

Monday, September 2.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. E. J. Steegmann, M.B., on "Mechanical Physics; Laws of Motion, Hydraulics, &c." 7 p.m.

Tuesday, September 3.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow (First day).

INTERNATIONAL ENGINEERING CONGRESS.—Opens in Glasgow.

QUERIES ANSWERED

RESPECTING

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Aug. 30	Denbigh—Additions to Asylum	Committee of Visitors	T. M. Lockwood & Sons, Foregate Street, Chester.
„ 30	Tynemouth—Alterations	School Board	F. R. N. Haswell, Tyne Street, North Shields.
„ 30	Guildford—Covered Way	Guardians	Peak & Lunn, 36 High Street, Guildford.
„ 30	Kidwelly, Llanelly, Wales—Alterations, &c.	School Board	Gwendraeth Stores, Kidwelly.
„ 30	Langley Park, Durham—Cottages	Consett Iron Co., Ltd.	C. E. Oliver, General Offices, Consett.
„ 30	Rodley, Leeds—Shop Property	Mr. Samson Fox	T. Winn & Sons, 92 Albion Street, Leeds.
„ 30	Treherbert, Wales—Villa	—	Raglan Hotel, Treherbert.
„ 30	Eccles—Shelter Sheds	School Board	A. P. Stevenson, Solicitor, Kelso.
„ 30	Lewisham—Shed	Council	Surveyor's Office, Town Hall, Catford.
„ 31	Whitley, Northumberland—Police Station, &c.	—	J. Cresswell, County Architect, Moothall, Newcastle-on-Tyne.
„ 31	Belmullet, Ireland—Rectory	—	R. Carson, Belmullet.
„ 31	Ballygilbert, Ireland	—	Rev. W. Dickson, Helen's Bay.
„ 31	Cwmpark, Wales—Houses	Greenfield Building Club	Park Hotel, Cwmpark.
„ 31	Great Thurlow, Suffolk—House	—	A. J. Simpson, Haverhill, Suffolk.
„ 31	London, N.—Repairs, &c.	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Embankment, E.C.
„ 31	London, S.E.—Alterations, &c.	Metropolitan Asylums Board	Board Offices, Embankment, E.C.
„ 31	Moville, Yorks—Residence	—	J. A. Jamieson, Moville.
„ 31	Wombwell, Yorks—Houses	Mr. A. Gibbon	J. Robinson, Architect and Surveyor, Wombwell.
„ 31	Truro—Enlarging School	Trustees	E. Beard, The Cemetery, St. Clement's Hill, Truro.
Sept. 2	Middlesbrough—Asylum Extensions	Visiting Committee	A. Sockett, Clerk to the Committee, Municipal Bldgs., Middlesbrough.
„ 2	Doune, Scotland—Station Buildings	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
„ 2	Ballintuim, Scotland—Additions, &c.	—	Ballintuim School, Ballintuim.
„ 2	Cliviger, Burnley—Houses	—	T. H. Mitchell, Architect, Strand, Todmorden.
„ 2	Coventry—Residences, &c.	H. Hewitt & F. J. Hibbell	Harrison & Hattrell, 28 Hertford Street, Coventry.
„ 2	Darlington—Wall, &c.	Streets Committee	Borough Surveyor, Town Hall, Darlington.
„ 2	Dunmow, Essex—Bathrooms, &c.	Guardians of Workhouse	S. Giffard, High Street, Great Dunmow.
„ 2	Ilkley—Hall	Congregational Church Trustees	Adkin & Hill, Architects, Prudential Buildings, Bradford.
„ 2	Merthyr Tydfil—Public Reading Room	Urban District Council	Surveyor to the Council, Town Hall, Merthyr.
„ 3	Boston, Lincs—Cookery Centre, &c.	School Board	J. Rowell, Borough Surveyor's Office, Market Place, Boston.
„ 3	Enfield—School	School Board	G. E. T. Laurence, 22 Buchanan Street, Adelphi, W.C.
„ 3	Knightstown, Ireland—Coastguard Station	—	Public Works Office, Dublin.
„ 3	Leeds—Buildings	Committee of Institute of Science, &c.	Bedford & Kitson, Greek Street Chambers, Leeds.
„ 3	Bridlington—Extension of School	—	Botterill, Son & Bilson, 23 Parliament Street, Hull.
„ 3	Dawlish—Bricks	Urban District Council	Engineer and Surveyor's Office, Dawlish, Devon.
„ 4	Leeds—Hospital Extensions	Sanitary Committee	Clerk of Works Office, Seacroft Hospital.
„ 4	Walmer—Council Offices	Urban District Council	R. A. Wilson, Surveyor to the Council, Walmer.
„ 5	Patterdale—Police Station	—	J. Bintley, 7 Lowther Street, Kendal.
„ 5	Holyhead—School	—	J. Owen, Menai Bridge.
„ 7	Banbridge, Ireland—Schoolhouse, &c.	Select Vestry of Seapatrick Parish	T. Larmour, Dromore Street, Banbridge.
„ 7	Edinburgh—Washhouses	Corporation	Public Works Office, City Chambers, Edinburgh.
„ 7	Rugby—Public Slaughterhouses, &c.	District Council	D. G. Macdonald, Surveyor to the Council, Rugby.
„ 9	War Department Contracts (Aldershot)—Repairs and Materials.	—	Sub-District Commanding Engineer, South Aldershot, R.E. Office.
	ENGINEERING:		
Aug. 30	Walthamstow—House Wiring	Urban District Council	J. Enright, 47 Victoria Street, S.W.
„ 30	Barton Regis, Bristol—Heating	Board of Guardians	A. P. J. Cotterell, 28 Baldwin Street, Bristol.
„ 30	Glasgow—Tramway Works	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 30	Sunderland—Wiring	Corporation	J. F. C. Snell, Dunning Street, Sunderland.
„ 31	Pickering, Yorks—Steam Road Roller, &c.	Rural District Council	R. Kitching, Eastgate, Pickering.
„ 31	Glasgow—Pumping Engine	Corporation Water Department	J. M. Gale, 45 John Street.
„ 31	Burnley—Reservoir	Rural District Council	S. Edmondson, 18 Nicholas Street, Burnley.
„ 31	Bournemouth—Water Cooler and Crane	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
„ 31	Cairo—Sleeping Car Service	—	Financial Secretary, Khartoum.
„ 31	Ilford—Tramways	Urban District Council	J. W. Benton, Clerk, Council Offices, Ilford.
Sept. 2	Amsterdam—Electrical Tram Carriages and Rails	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No. 164, Amsterdam.
„ 2	Leith, Scotland—Bridge	Town Council	Burgh Surveyor, Town Hall, Leith.
„ 2	London, E.C.—Engines	Bengal-Nagpur Railway Co., Ltd.	Company's Offices, 132 Gresham House, Old Broad Street, E.C.
„ 2	Halifax—Water Tower, &c.	Waterworks Committee	J. A. Paskin, 22 George Street, Halifax.
„ 2	Nuneaton—River Wall, &c.	Urban District Council	J. S. Pickering, Engineer, Council Offices, Nuneaton.
„ 3	Middlesbrough—Coal-Handling Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 4	Ellesmere, Salop—Retort Bench	Urban District Council	R. E. Lloyd, 1 Willow Street, Ellesmere.
„ 4	Aston, Birmingham—Plant	Urban District Council	R. P. Wilson, Consulting Engineer, Aston Manor.
„ 5	Macduff, Scotland—Harbour Improvement	Town Council	J. Barron, 1 Bon Accord Street, Aberdeen.
„ 5	Mansfield—Refuse Destructors	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
	IRON AND STEEL:		
Aug. 30	Huddersfield—Girders	Corporation	General Tramways Manager, Great Northern Depôt, Huddersfield.
„ 30	Belfast—Cast Iron Frames, &c.	Gas and Electric Committee	V. A. H. M'Cowen, City Electrical Engineer, Belfast.
Sept. 2	Burton-upon-Trent—Iron and Steel	Corporation	G. T. Lynam, Borough Engineer and Surveyor, Town Hall, Burton-upon-Trent.
„ 3	Dawlish—Ironmongery	Urban District Council	Engineer and Surveyor's Office, Dawlish, Devon.
„ 6	Valetta, Malta—Pipes, &c.	—	Superintendent of Public Works in Malta.
„ 9	Aberdare—Railings	Urban District Council	Surveyor, Town Hall, Aberdare.
„ 10	Barking, Essex—Wrought iron Railings	Urban District Council	C. F. Dawson, Public Offices, Barking.

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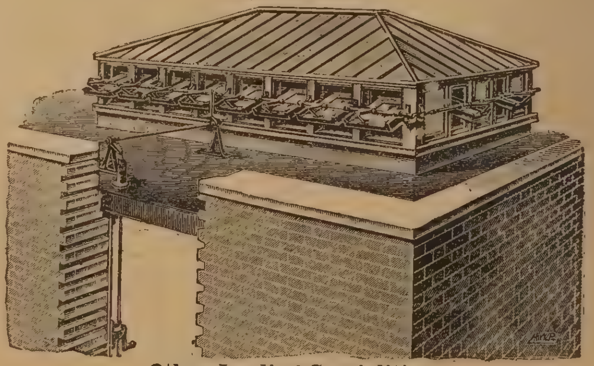

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		PAINTING AND PLUMBING:		
Aug.	31	Christchurch—Painting, &c.	Guardians	Workhouse, Christchurch, Hants.
Sept.	9	Jarrow—Repairing, &c. Lamps	Urban Sanitary Authority	Borough Surveyor's Office, Grange Road, Jarrow.
		ROADS AND CARTAGE:		
Aug.	30	Walthamstow—Private Street Works	Urban District Council	G. W. Holmes, Engineer to the Council, Town Hall, Walthamstow.
„	31	Bromley, Kent—Materials	Rural District Council	E. Hazlehurst, 98 High Street, Bromley, Kent.
„	31	Halifax—Streets	——	G. Buckley & Sons, Architects, Tower Chambers, Halifax.
„	31	Wakefield—Street Works	——	City Surveyor, Town Hall, Wakefield.
Sept.	3	Carshalton—Granite, &c.	Urban District Council	W. W. Gale, Surveyor, Carshalton.
„	3	Uckfield, Sussex—Paving	Urban District Council	Offices of the Council, Uckfield.
„	3	Dawlish, Devon—Granite, &c.	Urban District Council	Engineer and Surveyor's Office, Dawlish.
„	3	Ulverston—Widening of Road	Rural District Council	W. F. Y. Moleneux, 3 Bedson Street, Ulverston.
„	4	Hove, Sussex—Kerbing, &c.	Town Council	H. H. Scott, Town Hall, Hove.
„	4	Middleton, Lancs—Paving, &c.	Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton.
„	4	Clacton-on-Sea—Tar Paving	Urban District Council	A. R. Robinson, Surveyor to the Council, Town Hall, Clacton-on-Sea.
„	5	Chatham—Wood Paving	Corporation	Borough Surveyor's Offices, Town Hall, Chatham.
„	5	St. Austell, Cornwall—Steam Rolling	Rural District Council	J. Stephens, Cross Lane, St. Austell.
„	6	Shrewsbury—Steam Roller, &c.	Atcham Rural District Council	J. Everest, St. John's Hill, Shrewsbury.
„	9	Epping, Essex—Carting	Urban District Council	G. J. Creed, Epping, Essex.
„	9	Romford—Granite Spalls	Guardians of Union	W. Smith, 24 North Street, Romford.
„	9	London, E.—Vans	Stepney Borough Council	M. W. Jamieson, 15 Great Alie Street, Whitechapel, E.
„	9	Nottingham—Forming, &c.	Guardians	A. Marshall, Architect, King Street, Nottingham.
„	10	Barking, Essex—Street Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
„	10	Blackwell—Making-up Streets	Rural District Council	H. Silcock, 31b West Gate, Mansfield.

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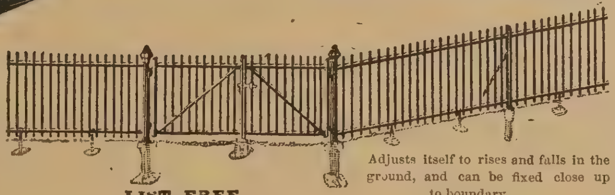

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		SANITARY;		
Aug.	30	Keighley—Drains	Rural District Council	H. M. Butterfield, East Morton, near Bingley.
„	30	Selby, Yorks—Cleansing, &c., Drains	Dam Drainage Commissioners	Commissioner's Offices, Abbey Yard, Selby.
„	30	Valletta, Malta—Pipes, &c.	—	Superintendent of Public Works, Malta.
„	31	Thornton Hough, Cheshire—Cleansing Ashpits, &c. ..	Wirral Rural District Council	J. E. C. Ollice, 54 Hamilton Street, Birkenhead.
Sept.	2	Cleland and Omoa, Scotland—Sewer Works	District Committee of Middle Ward ..	W. L. Douglass, 3 Clydesdale Street, Hamilton.
„	2	Dunfermline—Sewers, &c.	District Council	W. A. Baird Laing, 13 George Street, Edinburgh.
„	2	London, N.—Dust Collection	Urban District Council	R. J. Rutland, Sanitary Inspector, Town Hall, Edmonton.
„	2	Burton-upon-Trent—Lime for Sewage	Corporation	G. T. Lynam, Borgh. Engr. & Surveyor, Town Hall, Burton-on-Trent.
	3	Dawlish, Devon—Drain Pipes and Connections ..	Urban District Council	Engineer and Surveyor's Offices, Dawlish.
„	3	Pembury, Kent—Sewers, &c.	Rural District Council	W. Vaux Graham, 5 Queen Anne's Gate, London, S.W.
„	12	Lewisham—Concrete Sewers	Council	Surveyor's Office, Town Hall, Catford.
Oct.	8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
		TIMBER:		
Sept.	3	Cristiania—Wood	—	Arms Factory, Kongsberg.
„	9	London, E. Timber	Stepney Borough Council	M. W. Jamieson, 15 Great Alie Street, Whitechapel, E.
„	30	London, E.C.—Telegraph Poles, &c.	—	C. E. Stuart, Controller of Stores, General Post Office, E.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug.	31	Sheffield—Alteration of Ecclesall Church	—	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Sept.	16	Blackpool—Laying-out Land	£30, £15 and £5	Borough Surveyor, Town Hall, Blackpool.
Oct.	1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
„	29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
„	31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov.	15	London, N.W.—New Offices in Euston Road	£100, £75 and £50.	S. R. J. Smith, 14 York Buildings, Adelphi, London, W.C.

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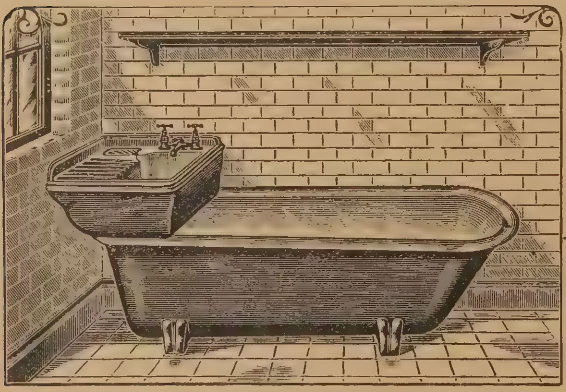

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

SEPT. 4, 1901.
No. CCCXLIII.

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Building as an Amenity.

WE have a proverb to prove that necessity is a very genuine mother. The good people at Christ Church, Northampton, who built their own school and parish room, when gentlemen well-known in local business circles might have been seen strutting about with hods on their backs; the Cumberland clergyman and his daughters who built their rectory from bottom to top; and the other vicar who, finding money short, painted the schools himself—all these testify to that proverb: and it is rather singular also that this amateur workmanship should be associated with churches, calling to mind those well-meant though most prosy speeches made by divines who are invited to the dinners of architectural societies—poor William of Wykeham to wit! And speaking of this matter reminds us of the visitor to an old church who, on examining the pews, remarked that they seemed to contain a lot of dry rot. "Ah!" said the verger, "but it's nothing to what we have in the pulpit." Nevertheless, whatever may have been their powers for or against somnolence when in their pulpits, the builder-clergymen to whom we first referred certainly deserved credit for the practical way in which they met their difficulties. But all the foregoing concerns men; now we have an instance of boy builders, of which full particulars will be found on page 53 of this issue. Some readers may recollect the case reported in these columns a year or so ago of two boys who occupied most of their spare time in dropping pieces of brick and stone into the lime (and damaging the other material) which was to be used in the repair of their father's house. Being a typical Englishman, the father said that "boys would be boys," and the judge, being a typical English judge, fined him ten guineas. Those boys were the raw material. But at Felixstowe you can see boys under control working on their new institute, of which a room 40ft. by 24ft. is being erected for the present. There is a village club and reading-room in Old Felixstowe, but the adult members cleared the place of boys, who roamed here and there till some ladies lent a helping hand. The use of the local Board school was secured, and here the numerous classes (including carpentry, building construction and carving) were conducted till space became too limited. It was then that the present scheme received its inception. In a short time the land, the plans, the materials, the scaffolding, the roof work, the carting, and even the installation of the electric light had all been promised, and now many busy hands are at work. Most of the boys have stuck well to their self-imposed task; their friends, including one member of the district council at least, have from time to time dropped in to lend a helping hand; one of the ladies even has been seen on top of the scaffolding engaged in the rough task of laying bricks; and it is said that a visiting clergyman — now indisposed, unfortunately — evinced such an active interest in the work that he went through a brief apprenticeship to the business, starting right from the elementary task of learning how to mix mortar (is not this another instance of the unity between the Church and building?). The work is necessarily not without flaw, but it is solid enough to withstand the weather, and that is all that can be expected. One hears so much talk nowadays—even among architects—that a little practice comes quite as a relief. Amateur building as a fad is not to be encouraged; but when it becomes the only means of solving a difficulty we think that those who practise it under technical guidance certainly deserve praise, and none more so than these boys of Felixstowe and those several gentlemen who are directing their labours.

Mr. Alfred Waterhouse.

WE are glad to be able to announce an improvement in the general condition of Mr. Alfred Waterhouse, who for some time past has been lying ill of paralysis at Yattendon Court, his country house in Berkshire; and we trust that he will now speedily recover. Mr. Waterhouse is one of the few members of his profession who practises painting. In last year's Academy he exhibited a large study in oil of a Berkshire country road, painted near Yattendon. Mr. Waterhouse is the holder of one of the highest offices in the Royal Academy, that of treasurer, a post he has filled since it was resigned by Mr. Horsley in 1898. At Yattendon Mrs. Waterhouse, who shares her husband's artistic sympathies, directs, in connection with the Arts and Industries Association, a large class of amateur workers in brass, pewter and copper *repoussé*, some excellent examples of which were shown at the May Exhibition in the Royal Albert Hall.

LOUGHBOROUGH CHURCH

DRAWN BY E. STANLEY MITTON.

IN AND ABOUT WENSLEYDALE.

BY J. TARNEY.

IN a little village called Carperby, in the centre of a Yorkshire dale, we spent a fortnight of fine days. In these days a particular breed of sheep and a noted make of cheese are the products chiefly associated with Wensleydale, and curiously enough this celebrity for cheese-making is quite a survival of the Middle Ages, as we read that "the monks of Jervaulx (Abbey) at the eastern extremity of the dale were in the olden days noted for their breed of white horses, their singing and the making of cheeses." Wensleydale, however, possesses examples of ecclesiastical, monastic and military architecture which though unable to compete in grandeur with other portions of the county—at any rate as regards the first two—yet are well worthy of examination; added to this the great beauty and variety of its scenery, which the great Turner found worthy of his pencil, combines to render Wensleydale a desirable and happy "hunting ground."

Approached from Hawes Junction at the west of the dale, Carperby, our headquarters, is situated about a mile from Aysgarth Station. It consists of one long straggling street with a rude sort of cross in the midst, dated 1675, standing elevated upon seven steps about 9ft. from the ground; there is nothing else of interest about the village, but it forms a good centre. From there we visited Askrigg and Nappa, Redmire and Castle Bolton, Wensley, Middleham and Coverham, Jervaulx and Spennithorne.

The beauty of Aysgarth is exquisite, with its waterfalls and acres of wooded expanse, in the summer redolent with the perfume of the wild rose, which grows in luxuriant profusion; and in the autumn one glowing mass of russet and gold, thrown up against the dark background of Penhill, with the tower of the church forming a dominant point in the landscape.

With the exception of the lower portion of the tower, the church has been entirely rebuilt. The chief object of interest here is the fine rood screen said to have been brought from Jervaulx Abbey, in an undivided state, by twenty men shoulder-high—a not inconsiderable feat considering the distance is fourteen miles. This, occupies the south side of the choir; it is of oak with elaborate carving and groined cove, and has been painted and regilded. On it is cut the following inscription: A.S. ABBAS. ANNO D'NI 1536.

The initials are supposed to be those of Adam Sedburgh, abbot of Jervaulx, who was hanged in the same year that the "old" church was restored for the part which he took in the rebellion. The elbows to the prayer desk are very fine and richly carved with heraldic devices, &c.; they evidently form part of the set of stalls from St. Agatha's Abbey at Easby, the remainder of which are at Wensley Church. They are cut out of solid oak 5in. thick, with battlemented buttresses surmounted by animal figures and fine poppy heads. On one elbow, surmounted by a crocketed canopy, are the mitre and crozier, underneath which is a shield bearing the initials H. M., probably a former abbot. Aysgarth village is about a mile away, of no special interest except for the fine views from its elevated street.

Four miles west from Carperby is the quaint market town of Askrigg, and within one mile you discover Nappa Hall, snugly ensconced under the lee of the wooded scar, where the ground falls away so rapidly that the roofs and chimneys are on a level with the high road. You enter through a gateway in the stable wing into a courtyard grass-grown and quiet. On the left is the main building, consisting of two embattled towers of unequal height, connected by an intermediate building which was formerly the great hall, and which is lit by mullioned windows with cusped heads. The building is in good preservation, though the old panelling and furniture have all been removed. The parlour, now used as the farm kitchen, still retains its fine oak moulded beams and joists forming the ceiling. Nappa Hall, according to Leland, was built by one Thomas Metcalfe, who was "yn those quarters a great officer, as steward survien of receyvor of Richmont landes, whereby he waxed riche and able to build and purchase." In the first year of Richard III. he was made Chancellor of the Duchy of Lancaster and a Privy Councillor, and lived through the reigns of Henry VI., Edwards IV. and V., Richard III. and Henry VII. From an historical point of view Nappa is also interesting from the fact of its having entertained Queen Mary of Scots when she paid a visit to Sir Christopher Metcalfe and passed two nights there in 1569. Here also King James I. was entertained by Sir Thomas Metcalfe, known as "the Black Knight of Nappa," when he visited this and the adjoining dale (Raydale) for the purpose of stalking deer.

There is a quaintness and picturesqueness about the quiet grass-grown streets of Askrigg which is very pleasing: "Drunken Barnaby" in his "Journal of Adventures" thus describes the place:—

> "Thence to Askrigg market noted,
> With no handsomeness about it;
> Neither magistrate nor mayor
> Ever was elected there," &c.

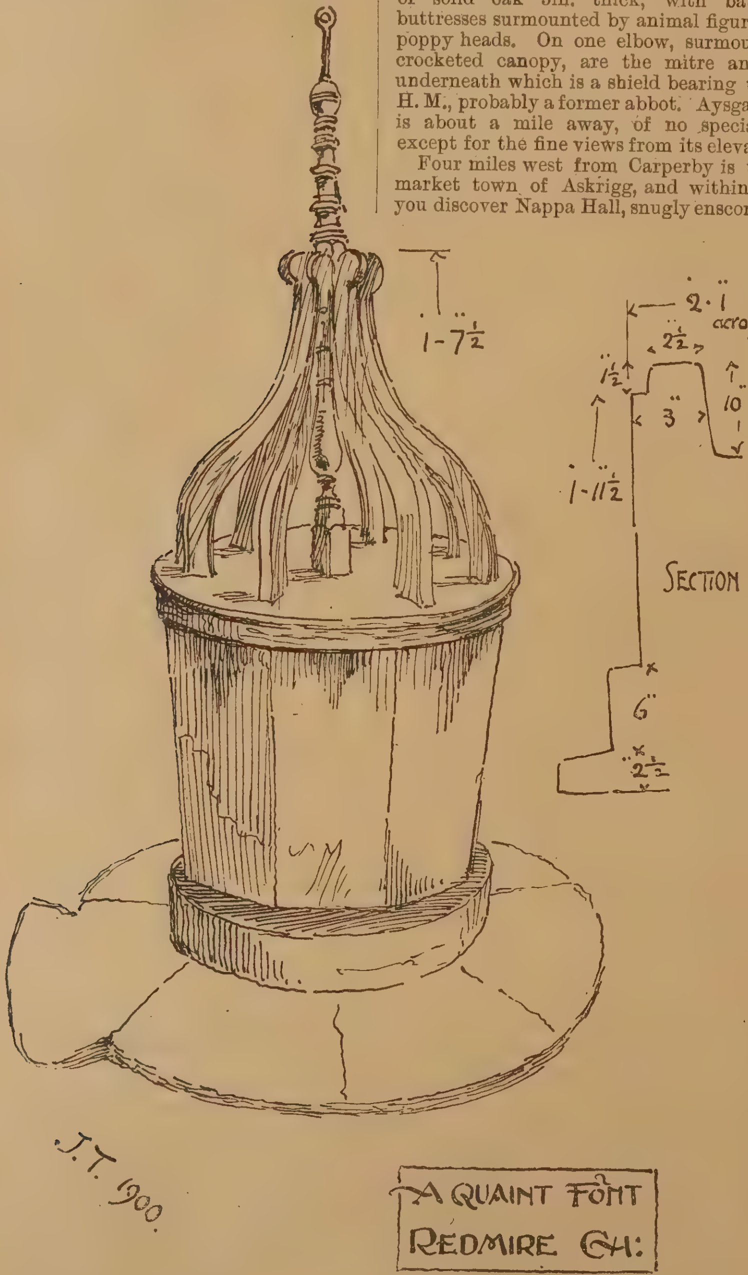
"Drunken Barnaby" was evidently no judge of architecture, for facing the stone Market Cross stands a fine-gabled and many-mullioned house, known as the house of the Thorntons, rising straight out of the street, with its gardens lying behind. This house forms the chief centre in Miss Jessie Fothergill's novel "Kith and Kin," where it is faithfully delineated. It has two doorways, with heads of the type peculiar to North Lancashire and the Yorkshire borders, and the following inscription is cut over one of them:—

"Gulielmus Thornton posuit hanc Domum MDCLXXVIII omnie enim domus A. P. paratur. Agliopiam ru vero contraluit haec omnia est Deus. Heb. 3, 4."

The ruined castle of Bolton soon becomes visible after leaving Aysgarth to the east—standing four square, with its grey towers against the russet and purple of the moors behind. A nearer view shows the almost complete aspect of the exterior of the castle, which Parker in his "Domestic Architecture" describes as "one of the most perfect baronial residences remaining in England." It would be difficult to imagine a more pleasant day than one spent in rambling about its walls and the little hamlet which nestles under them. The houses, with their thatched and stone-slabbed roofs, are clustered round a green which is enclosed on the west by the castle and diminutive church.

The castle consists on plan of four lofty towers, each connected by a curtain, forming a quadrangle or courtyard. The sides vary in length, the north measuring 187ft., the south 184ft., the east 125ft. and the west 131ft.; and this singular irregularity is carried out in the towers, the north and south sides measuring 47ft. 6in. and the east and west 6ft. to 7ft. less in the square. The walls, 7ft. thick, are 96ft. high. The gateway—narrow, tall and plain—is in the east curtain close to the south-east tower, and has been defended by a portcullis. It gives access to a courtyard, from which four doors, each formerly strongly defended by double portcullises, communicated with the castle. The grand hall was on the south, the chapel on the north side.

The castle was built by Richard, Lord Scrope, Chancellor of England and Keeper of the Great Seal, in 1379. According to Leyland it took eighteen years to build, and cost £12,000. Of it he also says: "Most part of the timber that was used in building this castle was felled in the forest of Engleby in Cumberland, and Richard, Lord Scrope, for the conveyance of it, had laid by the way divers draughts of oxen to



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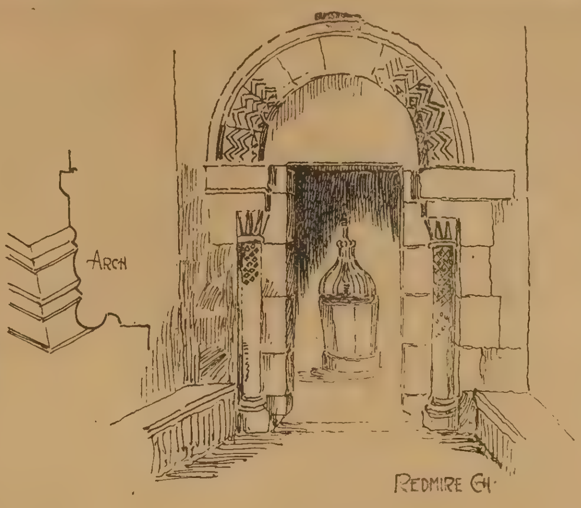
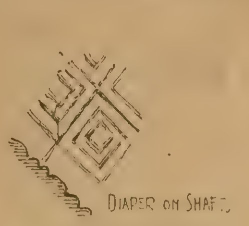
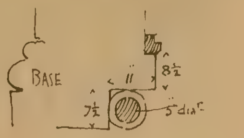






carry it from place to place until it came to Bolton."

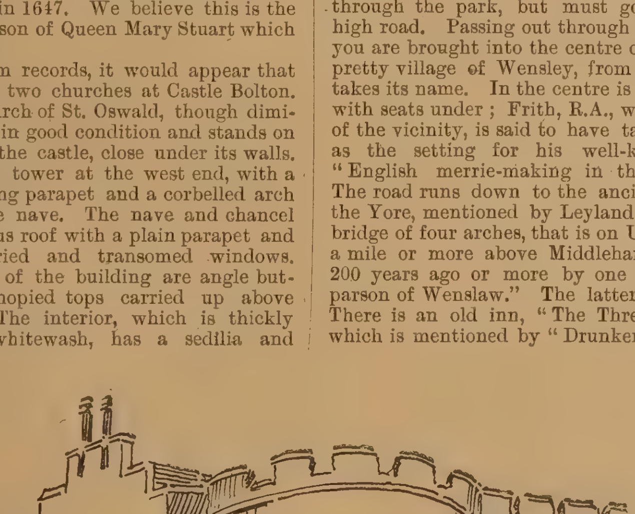
One is led to wonder, when looking at the massive masonry of the walls and the area of the building, what the cost might have been if erected in these modern days of rising prices and trades unions, &c. The historical associations of Bolton throw a halo of romance about it, which makes it doubly interesting; for here, in the early autumn of 1568, Queen Mary Stuart was brought by Lord Scrope, to whom she had surrendered at Carlisle, and by the order of Elizabeth kept a prisoner until the time that Fotheringhay looked its last upon her. Mary was confined in the south-west tower, and the window is still shown in the west front from which she is said to have escaped previous to her re-capture on "Leyburn Shawl," a beautifully wooded natural terrace near Leyburn, which still retains the name of "the Queen's Gap."

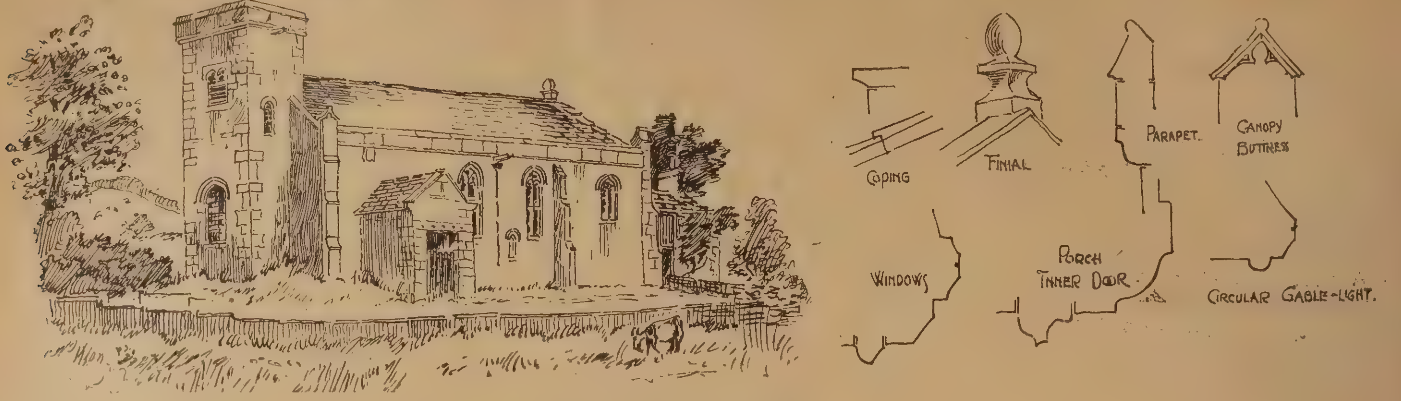
The castle was defended against Cromwell by Richmondshire Militia under Colonel Scrope, and afterwards under Colonel Chaytor, until, like the gallant defenders of Ladysmith and Mafeking, the garrison was reduced to eating its own horses. By order of the Parliament it was dismantled in 1647. We believe this is the only English prison of Queen Mary Stuart which is still standing.

Formerly, from records, it would appear that there have been two churches at Castle Bolton. The existing church of St. Oswald, though diminutive in size, is in good condition and stands on the west side of the castle, close under its walls. It has a Norman tower at the west end, with a plain overhanging parapet and a corbelled arch opening into the nave. The nave and chancel have a continuous roof with a plain parapet and curiously traceried and transomed windows. At each corner of the building are angle buttresses with canopied tops carried up above the parapets. The interior, which is thickly coated with whitewash, has a sedilia and credence and two niches, one on each side of the east window. On the south side is a porch, the outer doorway of which is a plain square opening lintelled over by an oak beam having square pateræ sunk on the face.

Redmire, the next village to Bolton, is not architecturally interesting. The church, which is dedicated to the Blessed Virgin, stands some way off at the entrance to the park of Bolton Hall, the seat of Lord Bolton. It is a small Norman edifice with Early English and Decorated additions, and still retains its old oak roof, but the church has been fitted with commonplace pitch-pine fittings which are entirely out of keeping, and the quaint old font with its painted wooden cover seems to stand as a silent protest against them. The south doorway is a good example of Norman work, and also the bell gable which, however, is minus its cross. Leaving the church, we continue through the park under beautiful old trees with the river near winding along through the charming woods until the front of Bolton Hall is reached. Built in 1678 after the castle became untenable, it consists of a centre and two wings of no particular interest. It may be as well to warn cyclists that they are not allowed to cycle through the park, but must go round by the high road. Passing out through the lodge gates you are brought into the centre of the prim but pretty village of Wensley, from which the dale takes its name. In the centre is a huge elm tree with seats under; Frith, R.A., who was a native of the vicinity, is said to have taken this green as the setting for his well-known picture, "English merrie-making in the olden time." The road runs down to the ancient bridge over the Yore, mentioned by Leyland as "the fayre bridge of four arches, that is on Ure, at Wensley, a mile or more above Middleham, made about 200 years ago or more by one called Alwine, parson of Wenslaw." The latter died in 1430. There is an old inn, "The Three Horseshoes," which is mentioned by "Drunken Barnaby" in his "Journal of Wanderings." The church, dedicated to the Holy Trinity, is perhaps the most interesting in the dale, and is rich in heraldry. The church dates from the twelfth century (about 1190), with additions and alterations in the fifteenth. On plan it consists of a west tower, nave and aisles, chancel, vestry on the north side with a room above, and north and south porches. The tower, which is massive and dated 1719, is in the debased style of that period, as also are the west windows of the aisles. The south porch has a sundial above the doorway with the inscription: "It's a shadow, so is life." Along the outside of the east wall of the chancel is a stone seat, which is somewhat curious. All the buttresses are carried up above the parapets and terminated by battlemented square tops; in the face of the buttresses are shallow square niches with ogee heads with drip stone and heads for terminations The niches are filled with shields of arms as follows: (1) Scrope, (2) Fitzhugh, (3) Scrope of Masham, (4) Nevile, (5) De Ros, (6) Scrope of Masham impaling Montacute, (8) De Ros, (9) Scrope, (10) A fess between three roses, (11) De la Pole. The nave is lofty and without a clearstory, the arcade measuring 12ft. 4in. to top of cap and the piers 16ft. 5½in. apart. The chancel is Early English. On the south side are three sediliæ and three windows (the first blocked up), all ornamented on the inside with the dog tooth in the jambs and arch. The second window is curtailed to receive the priest's door, and the third is the lychnoscope, transomed and carried down below the sill of the other windows. The stalls in the choir are superb in design and execution, and are said to have been brought from St. Agatha's Abbey at Easby, probably by John, tenth Lord Scrope of Bolton. They stand before the chancel screen and along the north and south walls of the choir, and have richly-decorated elbows with poppy-heads of very spirited design. The fronts are divided into panels, each bearing a shield with a portion of the following inscription cut in letters of good character: "Hen ri cus Ri che rd son huic Rec tor hos fe cit Sup tus Dñi M° CCCCC° XX° VII° So li Dei Ho nor et glo ri a." In front of the poppy-heads are figures of animals chiefly heraldic. Commencing at the south-east: (1) a wyvern, (2) bear, (3) lion, (4) griffin, (5) hare, (6) unicorn, chained. The execution of the hare especially is very spirited and life-like. Two bench ends have achievements: (1) The arms of Scrope and Tiptoft, with helm with open bars, and two Cornish choughs as supporters, (2) Scrope and Tiptoft, quarterly impaling Dacre and Warren; beneath, the initials H. R. The woodwork at the east end of the north aisle is a portion of the parclose of the Scrope chantry from Easby Abbey, and is crowded with heraldic bearings giving the alliances of the house of Scrope. The Perpendicular work is, however, set behind some poor Renaissance work, the whole forming the Bolton family pew.

There is a fine marble slab in the north aisle bearing the effigies of a male and female of the Scrope family and dated 1525. In the nave pavement is a stone with an inscription round it of the exaggerated size of 8ft. 2in. by 6ft. 2in. The most remarkable of the monuments in the church, however, is the magnificent full-length


SPENNITHORNE HALL.

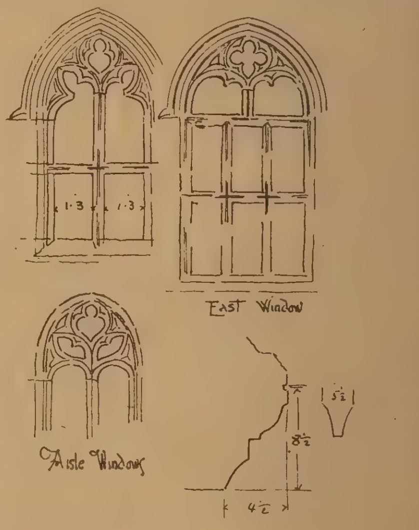


CASTLE BOLTON CHURCH.

brass of a Catholic rector or warden in complete vestments, with the veiled chalice above his crossed hands. The inscription is removed, but the name is known to be that of Sir Simon de Wenslagh, rector 1390, from the will of Oswald Dykes, rector in 1607, who desired to be buried under this stone, and an inscription concerning whom is let in at the head of the brass, to its injury. This economical form of perpetuating their memory seems to have been frequently practised by our ancestors, as one has often heard of brasses found to have been turned over and re-used, but the above is a very glaring example, possibly more one of religious zeal than of miserliness, the memorial being to a Catholic rector. The east window contains some old glass chiefly heraldic. Evidence of the former existence of a Saxon church is given by a stone built in the north aisle wall, which shows a cross with two birds in the top corners and two dragons in the lower. Beneath, in Saxon characters, is the name DOMFRID. The nave and chancel have their old oak roofs, but the aisles are ceiled in plaster, and the whole church is coated inside with whitewash and paint and is badly in need of careful restoration; the fact, however, that the old oak altar-rails had recently been newly painted and grained augurs ill for any intelligence in this direction. There is a quaint double-decked pulpit and desk of late character and old pews and benches in the nave and aisles of oak; also a font of sixteenth-century workmanship.

Middleham, one mile from Wensley, is a curious mixture of large village and small country town, and was once the "capital" of the dale, a charter for a weekly market having been granted by Richard II. in 1388. Two market crosses still remaining attest this fact—one, comparatively modern, and the other, which is known as the Boar Cross, having a rude representation of a boar standing on the north side, the cognisance of Richard III. The town is dominated by the ancient castle, under whose ruined walls the houses are closely crowded. The ruins are very extensive, occupying a space of 210ft. by 178ft. and flanked by a square tower at each angle. In the centre of the grass-grown enclosure is the Norman keep built by Robert Fitz Ralph about 1190, around which are grouped the buildings of the Nevilles, erected to accommodate their vast train and to support their princely habits; for when residing at Middleham the Nevilles were at the zenith of their power, and the castle became renowned throughout the land for its hospitality and vast entertainments. To give an account of the historical associations of the castle would take up too much space; suffice it to say that here was brought a prisoner, Edward IV., by the great baron, the last of the Nevilles in the male line, and also the greatest—Richard, Earl of Warwick and Salisbury, known as the king-maker, Lytton's "last of the Barons." Middleham was also the favourite residence of Richard III., the son-in-law of Warwick.

The parish church has been restored. Dedicated to the Blessed Virgin and St. Alkelda, its general character is Decorated, with later insertions: the plan is made up of a nave, aisles and chancel, west tower, south porch and vestry. On the south side of the tower is a window which looks towards the castle, and the arrangement of the interior of the tower in the storey to which it belongs leads to a suspicion that this was at least a watch tower, if not a chamber of defence, connected with the military works of the castle; for it is obviously intended at least as a temporary residence, being furnished with a fireplace. Richard III. made the church collegiate, with a dean and six canons. One of the canons of modern times was the Rev. Charles Kingsley. The tower arch is lofty and the west window good Perpendicular. On the north wall inside the tower is the sepulchral stone that once covered the coffin of Robert Thornton, twenty-second Abbot of Jervaulx and Dean of Middleham, and is remarkable for his rebus elaborately and beautifully carved upon it. At the foot of the stone is a "Tun," out of which issues a thorn tree, forming the rebus Thorn-ton, which fills the stone with its innate ramifications; surmounting the Tun is a mitre and crozier, and at the sides are the initials R.T. Two shields at the top bear the sacred monogram. Round the border of the stone runs this legend, each word divided by a thorn leaf: "Orate · Pro · a'i'a Dompni · Roberti · Thorneton · Abbat · Sc'di." In the west window of the north aisle are some fragments of old glass. This aisle, which retains its old oak roof in good preservation, is, however, greatly disfigured by the wretched gallery which blocks up the arches. Passing through the town and mounting the rising ground, you presently emerge upon the wide moorland, well-known as a training ground for racehorses. From here the Vale of the Cover is spread out before you. On the opposite side is Braithwaite Hall, an early seventeenth-century structure, now a farm. One room is panelled to the ceiling, with a carved oak mantel and secret door and passage. On the north side of the river near the bridge are the remains of the Abbey of Coverham, which was founded in 1214 as a home for white canons by Ralph Fitz-Robert, a descendant of Ralph de Glanville, some time Lord Chief Justice of



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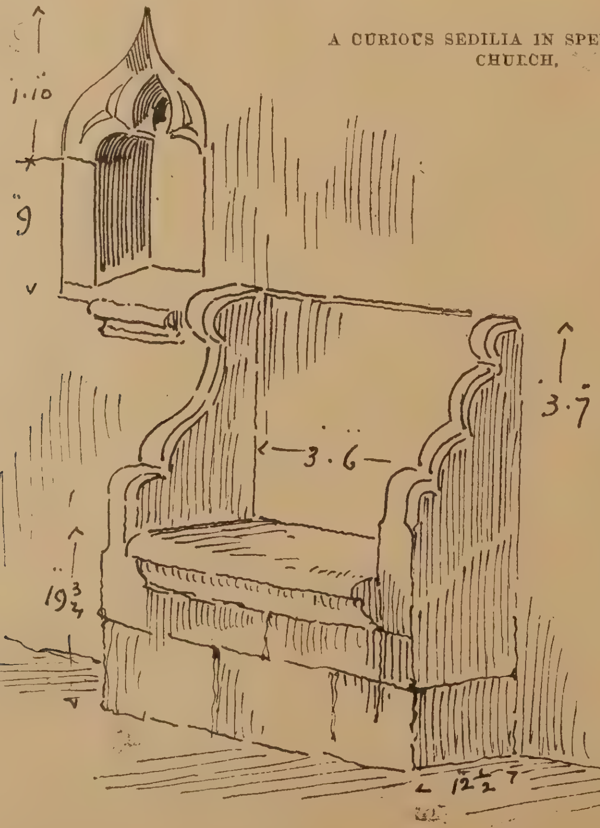


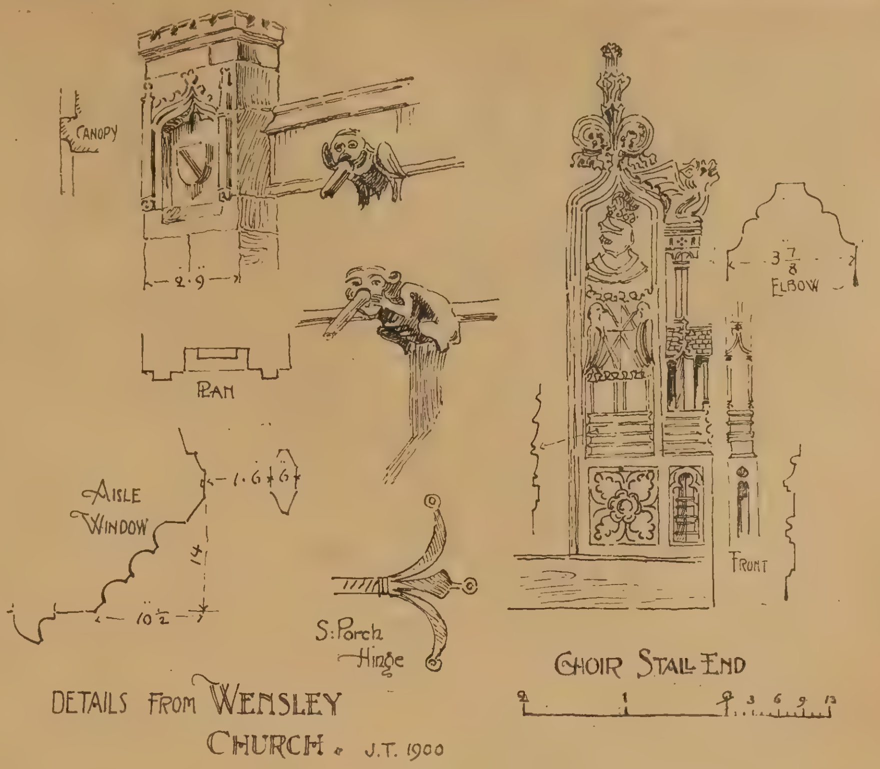
A CURIOUS SEDILIA IN SPENNITHORNE CHURCH.

England. The remains of the church show it to have been not a large, but a very graceful, Early English fabric. Two arches of the nave of the Decorated period remain, and also part of the abbot's lodgings and the Norman entrance gateway. The abbot's lodgings have been converted into a dwelling-house, and the gardener of the owner is constantly unearthing carved stones and coffin lids; indeed, just before we were there he discovered a very fine stone coffin in perfect condition, of which there are many specimens about. Two very singular cross-legged sepulchral figures are reared against the wall of the adjoining garden. One of them is the very remarkable figure of Ralph, son of Robert Neville, showing the figure surrounded with a stag and hounds in full chase. He was buried in the choir in 1331. There are many inscribed stones and monograms inserted in the wall of the old abbey buildings, mostly of the same date and late workmanship, and which seem to point to a fondness on the part of some individual for working the sacred monogram, &c.

A very fine altar stone, which has been brought from this abbey, is built into the wall near the entrance at "Bear Park," Aysgarth, the seat of Mr. T. Bradley. The sacred monogram, &c., with figures of angels and the emblems of the Crucifixion, are here employed, with an inscription below part of which is worn away. "Bear Park" is in the Tudor style, but has been not very carefully restored; it has, however, very fine panelled oak rooms, furnished with beautiful old furniture which the owner takes a delight in collecting. This house was formerly the seat of a younger branch of the Metcalfes of Nappa. The garden is tastefully laid out, mostly with Alpine plants, and very fine views of the river and woods are here obtained, the house being situated just above the High Falls.

Returning to our journey at the east end of the dale, three miles from Middleham on the south bank of the Yore, and almost at the extremity of the dale, stand the remains of the Cistercian Abbey of Jervaulx or Jorvalle.

The unerring instinct of the monks of old in finding the richest, most beautiful and sheltered sites for the foundation of their abbeys seems to have stood them in good stead in this case, Jervaulx being set in a charming vale, fertile and well-wooded, with the indispensable river flowing close by.

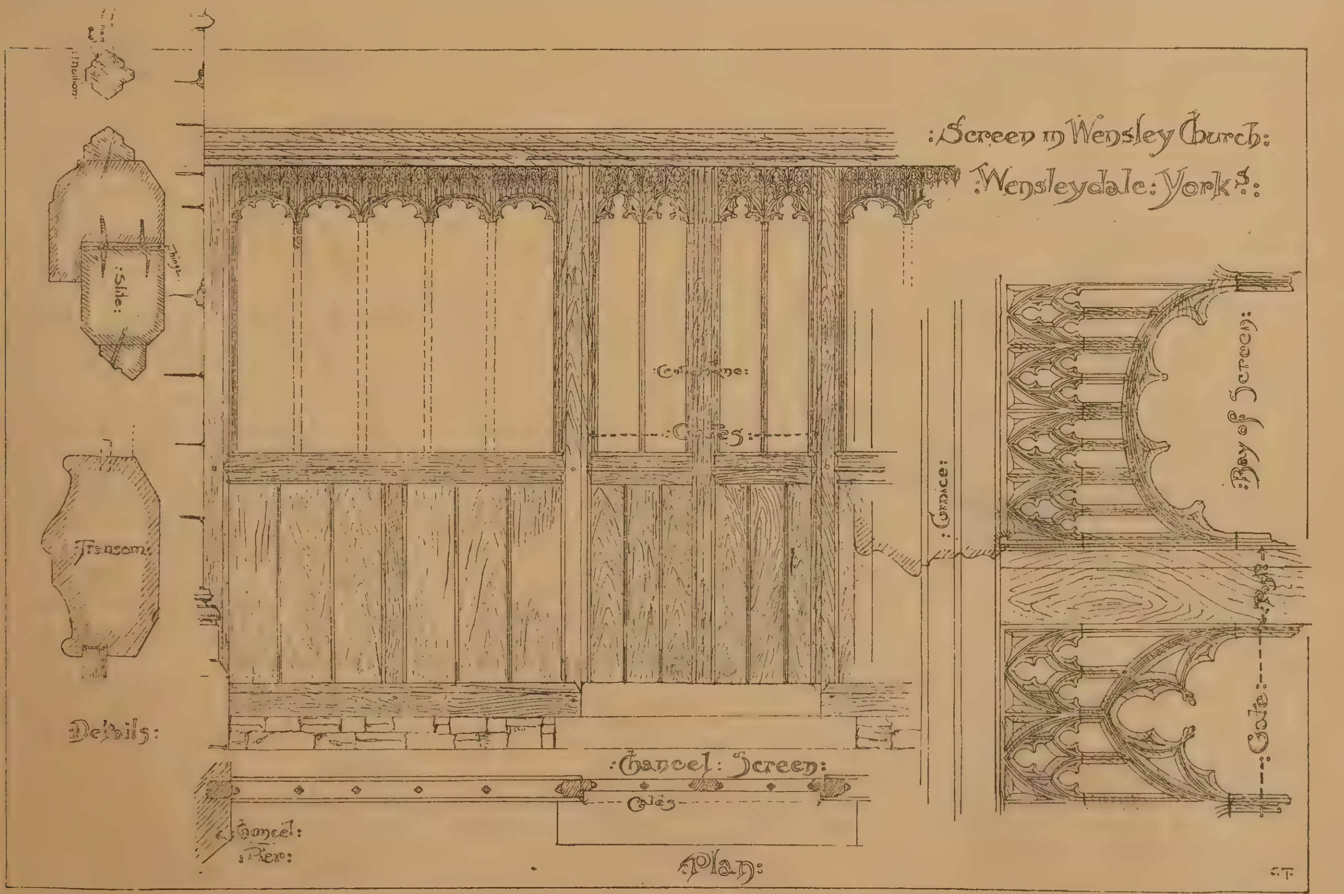


DETAILS FROM WENSLEY CHURCH. J.T. 1900

The original founders of the abbey were some monks from Savigny, who, having obtained a gift of land near Bainbridge (at the west end of the dale) founded the Abbey of Fors, now disappeared, in 1144. They removed to Jervaulx in 1156, when the abbey was built. There were in all twenty-three abbots, John de Kingstone being the first, and Adam Sedburgh, who was executed in 1537 (see Aysgarth Church), the last. The abbey was destroyed in 1538 by order of Henry VIII. The church was razed almost to the ground, but is so exactly marked out by the bases of the pillars and the few courses left on the walls that we might almost fancy the masons had just left the walls above the foundation There are several flat monumental stones extending along the centre of the nave, with beautiful foliated crosses and inscriptions as sharp almost as if recently cut.

More remarkable than these is the stone altar in the north transept, standing upon two steps, perfectly entire and a rare example. The dimensions are: Height 3ft. 3in., length of top 6ft. 3in., breadth 3ft. 3½in. The steps only of the high altar remain, but there have been five others, including one in the south transept similar to the one in the north.

The church measures 270ft. long, 113ft. across



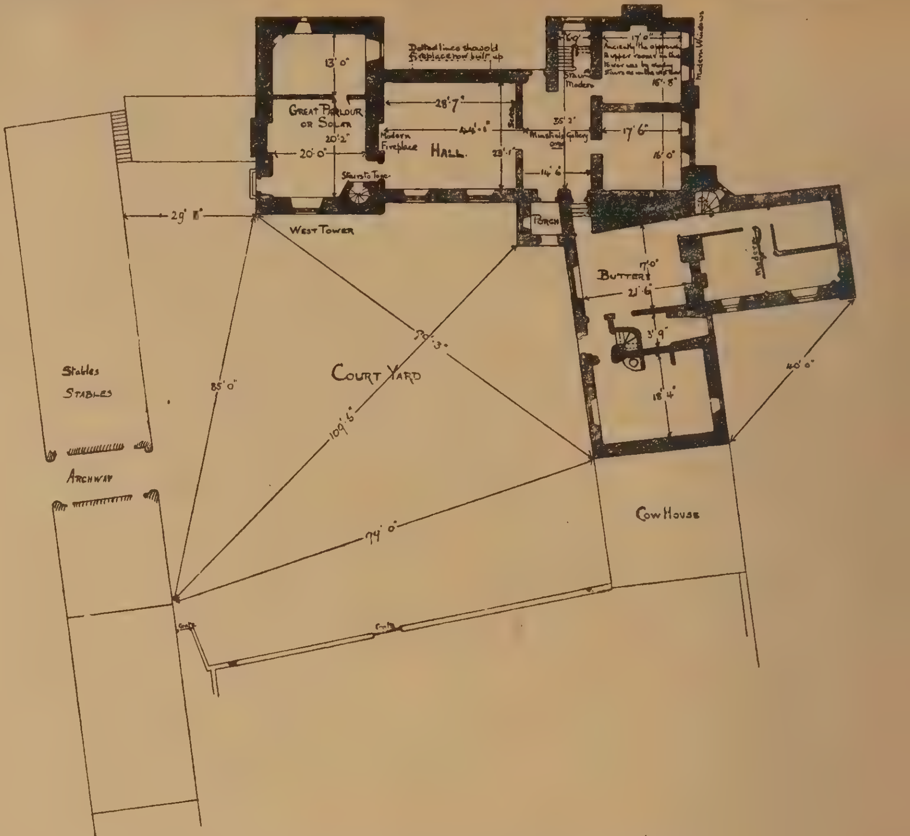
:Screen in Wensley Church: :Wensleydale: Yorks:

the transept and 63ft. across nave and aisles. On the south is the chapter-house, 48ft. by 35ft., originally supported by six marble pillars, of which four are perfect. The caps have a Byzantine appearance, and the bare moulds are as sharp as though cut yesterday.

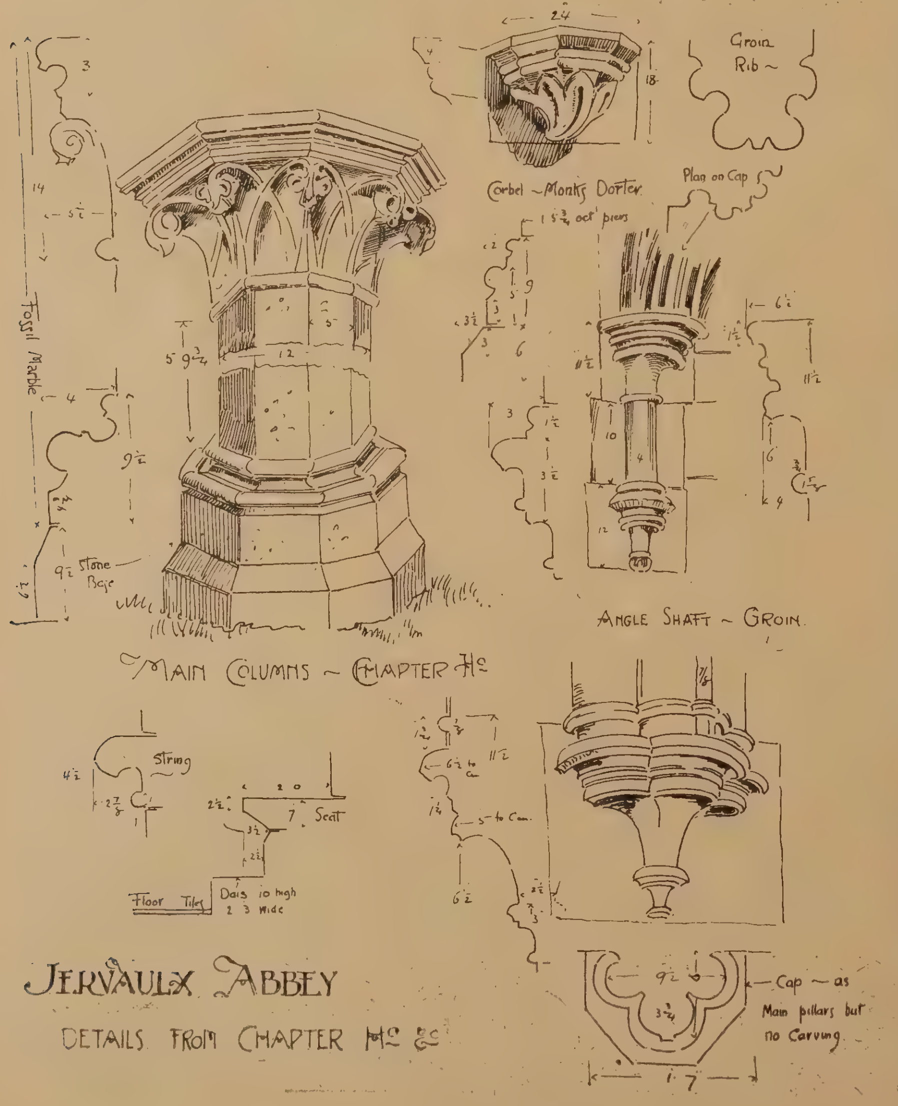
The stone seats and daïs running round three sides are perfect, and there are still remains of tiling. Of the Undercroft with Monks Dortes over, only the outer walls and pillar bases remain. East of the chapter-house is the abbot's lodgings, and further east the great kitchen, with three huge fireplaces, reminiscent of the hospitality for which the abbey was famous. To the west is the refectory, a noble room; at its south end we find a small chapel with a nearly perfect altar. Needless to say that there is plenty of opportunity for the study of mouldings, there being piles of stones of various portions of the doorways, windows, groins, &c., which are all the more "getable," if one may coin a word, from being in the position they are now.

It may be of interest to point out that it was a "Prior Aylmer of Jervaulx" who figured so prominently with "Isaac the Jew, of York" in Sir Walter Scott's "Ivanhoe."

The ruins were overhauled and excavated in 1806 by the then Earl of Ailesbury, but previous to that time had been used as a common quarry by the neighbouring farmers for generations. The present owner is Lord Masham, who keeps the place in good order. The key is obtained at a cottage near.



GROUND PLAN OF NAPPA HALL, WENSLEYDALE, YORKSHIRE.



Returning by Cover Bridge, and passing the inn, you cross the Yore by Ulshaw Bridge, the two rivers meeting near here. This bridge is one of the old picturesque kind, narrow, and with triangular recesses for the safety of foot passengers. Standing in the centre recess is a sundial bearing the date 1674. The road, rising rapidly, presently brings you in view of the castle of Middleham, which looks very massive and dignified from this point across the river. The charmingly situated village of Spennithorne, with its church tower peeping out from a bower of trees and blossom, is soon reached. The church, which is dedicated to St. Michael, dates from 1166, and was built by Robert Fitz Randolph. Three bays of the nave on the north are Norman, the south being Decorated work. About 1200 the church was lengthened one bay westward, the tower built and the chancel lengthened to its present length, and also the south aisle, porch and vestry added; the last, being part of the north aisle and extending into the chancel, was probably the chantry of the Fitz Randolphs. The tower is perhaps the most remarkable part of the church, its character being chiefly owing to the staircase turret which runs up the south-east angle in a rectangular projection, but in this instance is heightened by the appearance of figures surmounting the battlements on the south side, which looks towards Middleham and almost gives the appearance of being occupied by armed men.

Under the embattled parapet is a projecting moulded course with carved heads and bosses at intervals, also gargoyles: the aisles are enriched in a similar manner. The inner porch doorway is a fine Decorated example with foliated caps, and the east window of four lights is Perpendicular, the windows in the south side being Decorated. A curious form of sedilia is to be seen on the south side of the chancel of the form of a moulded stone bench, with shaped moulded elbows of stone 4¾in. thick, the space between the elbows being 3ft. 6in.

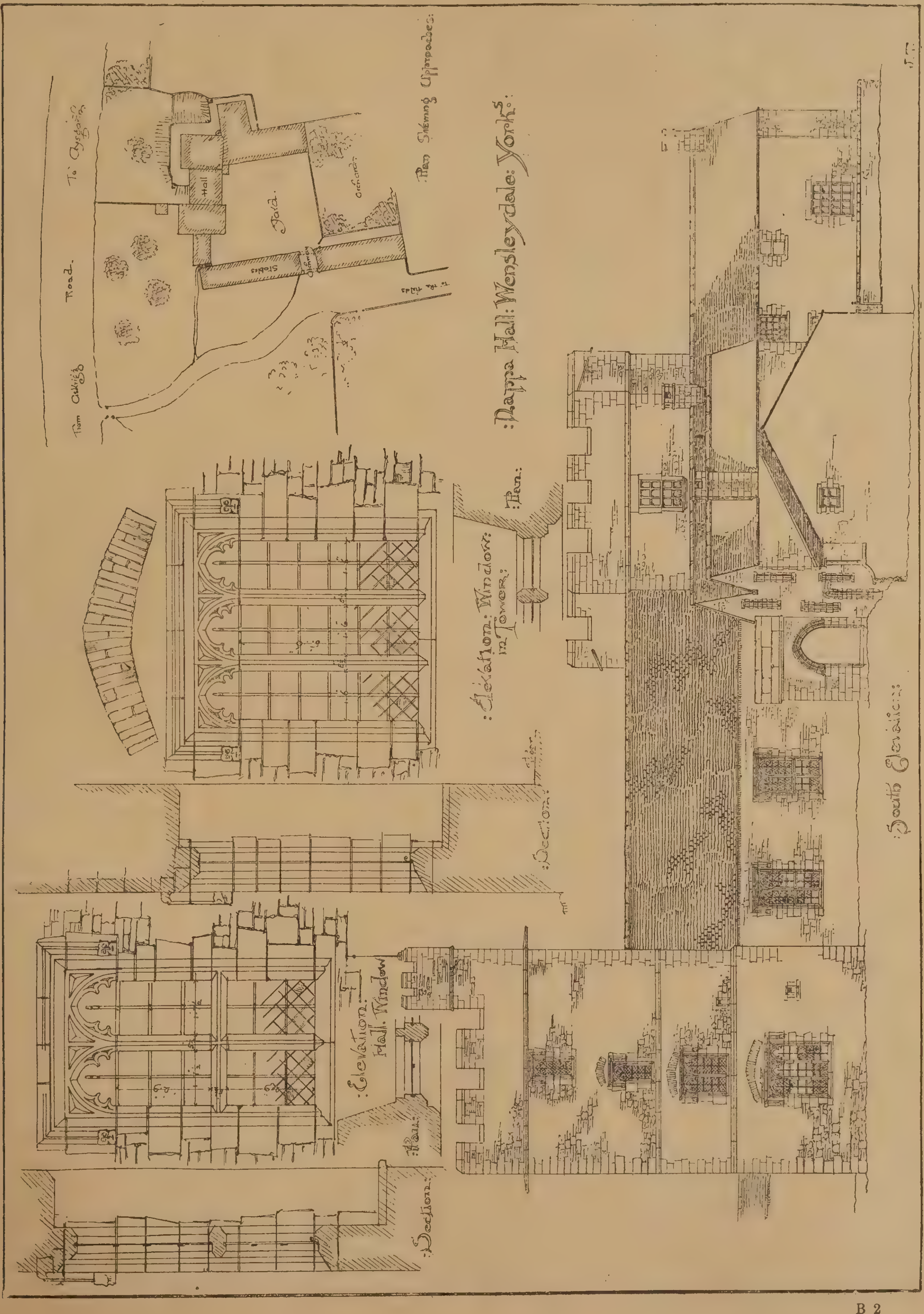
On the west wall of the south aisle is a figure of Time in fresco; this has been preserved by the many coats of whitewash on the wall. The altar tomb with shields and battlements in the north aisle is probably to some member of the Fitz Randolph family.

The parish church in the neighbouring town of Bedale is very fine, with a good tower and a crypt under the chancel. Your tour may easily be extended and terminated if desired at Ripon and York.

[The writer is indebted to J. Douglas, Esq., of Chester, for kind permission to use the plates of Nappa Hall, old stone door-heads at Wensleydale, and screen in Wensley Church—from the Abbey Square Sketch-Book.]

THE ARCHITECTURAL DRAWINGS AT GLASGOW.

A FIRST glance at the architectural section of the Glasgow Exhibition, through the medium of the catalogue, indicates at once the variety and the richness of the collection brought together in the Fine Art Galleries. Especially is this suggested by the collocation of names in the list of exhibitors. Robert Adam and Rowand Anderson, co-workers in the same building, Edinburgh University, though with a century between them, are here found side by side. Berlage Billings and Burnet, Campbell and Cuypers, Palladio and Paterson, Vandremer and Voysey, Webb and Wren—such are a few of the alphabetical groupings which strike the eye, and conjure up visions of the "mother art" in many lands and under many guises, of similar yet vastly different problems in plan, construction and design mastered by many minds. "An inspection of the gallery," says the "Glasgow Herald," "confirms these anticipations, and at the same time shows that the standard of the work exhibited is a high one; that of the 500 frames, of which many contain several drawings or photographs, few indeed are unworthy of careful study. There is matter for regret at the same time that the space at the disposal of this section of the Fine Arts Committee was so entirely inadequate for the amount of work placed at their disposal, with the result that

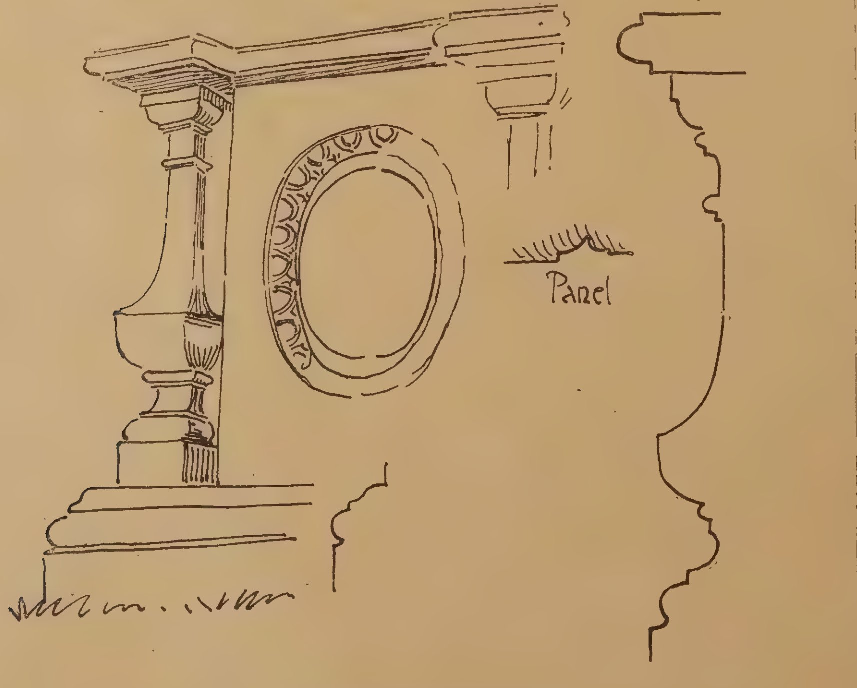


many interesting exhibits had been hung too high to be properly seen, while the grouping of works by the same artists and of similar character, which was originally intended, has had to be largely departed from.

"Not only so, but the collection has had to be dispersed throughout various sections of the buildings, the drawings from foreign sources being hung in the so-called North Balcony, while the interesting collection of photographs illustrating the architecture of Glasgow, brought together by the local Institute of Architects, has been hung at wide intervals under the arches leading into and round the walls of the Archæological West Court. In the east, or Architectural Court proper, the space on either side is divided up into a series of bays by screens extending from the wall to the stone piers supporting the galleries over; the back of each of these bays it was originally intended to devote to the work of one architect or group, but, as already indicated, the proposed arrangement had to be largely departed from owing to lack of space elsewhere to accommodate the works which could not be so grouped. In three or four cases it has been possible to adhere almost entirely, and in others partially, to this method of arrangement, with the result that a certain character is given to the exhibition, and the examination of the works either for study or review is rendered at once easier and more interesting, a result which might have been further assisted had the bays themselves been numbered. The one which first calls for notice, though not the first in the catalogue order, is that occupied mainly by a collection of work forwarded by the Royal Institute of British Architects, a collection in which the arts of architecture, sculpture and painting are all represented. The architects represented are all "old masters"; Palladio, the sponsor, and Inigo Jones, the father of Renaissance architecture in England, together with equally famous disciples and followers, Sir Christopher Wren, John Webb, and others, are represented by most interesting autograph sketch designs for chimneypieces, ceilings and other decorative feature. Sculpture of a personal kind adds a note of interest in the busts of Inigo Jones, G. E. Street and Sir Charles Barry, while of no less interest, personal and artistic, are the painted portraits of three more past presidents of the Institute—Professor Cockerell, by Boxall; Sir George Gilbert Scott, by Richmond; and F. C. Penrose, by Sargent; the last a brilliant example of the work of this artist, who, curiously enough, is not represented elsewhere in the galleries. Other works in the same group, and also forwarded by the Royal Institute, are a series of interesting drawings in colour or wash of notable buildings—the Middle Temple Hall, St. Paul's Cathedral, St. George's Hall, Liverpool, and others; while, though not sponsored by the Institute, the Hanging Committee has appropriately added in the adjoining spaces the design by the present president, Mr. William Emerson, for South Kensington Museum, balanced by that for the circular court of the new Government offices by the very recently deceased and greatly regretted J. M. Brydon, who was a vice-president at the time of his death."

THE NEW DOCK AT DOVER.

THE work on the new commercial dock at Dover is to be pushed forward as rapidly as possible. Until the Prince of Wales's pier, which has been completed at a cost of about £600,000, is connected with the South-Eastern and Chatham Railway systems, the Transatlantic traffic cannot be adequately dealt with. It is proposed to provide the necessary railway facilities in connection with the improvement of the old outer harbour, which is to be deepened. Lockgates are to be constructed at the entrance to this harbour, and the Prince of Wales's pier is to be connected with the railways by means of lines over these gates. The main portion of the scheme yet to be carried out is the erection of a water-station in the commercial harbour. This station, which will be 2½ times larger than Charing Cross Station, will accommodate sixteen trains under cover and have berths for four cross-Channel boats. The total cost of the works, including the sum required to pay off the debentures on the Prince of Wales's pier, will be £1,750,000. A largely-increased cross-Channel traffic, in addition to the development of a Transatlantic service, is anticipated. It is estimated that the harbour will be prepared for the Transatlantic traffic in two years, but it will take four years to complete the water-station.



A TOMB IN MIDDLEHAM CHURCHYARD.

THE WIDENING OF LONDON BRIDGE.

ARRANGEMENTS are now being definitely made by the Corporation for widening London Bridge, and this month a committee meeting will be held to discuss the sending out of circulars for tenders. The necessary plans and working drawings are being prepared in the office of Mr. Andrew Murray, the City Surveyor, and the work will probably be commenced next year. The problem of widening the bridge is one of immense difficulty, and has puzzled the City authorities for nearly a generation. The bridge throws a weight of five tons on every sq. ft. of its foundations in the London clay beneath the bed of the Thames, and when it was completed nearly seventy-five years ago the withdrawal of the surrounding piles and the squeezing out of the clay caused a somewhat unequal settlement of the foundations. This did not affect the stability of the structure, and there has been no perceptible movement since the first few months. But it is impossible to forecast the effect of driving piles or sinking steel cylinders near the foundations for the purpose of extending them, and engineers agree that the enterprise would be too risky. The complete rebuilding of the bridge would cost millions and untold inconvenience.

In 1879 a scheme was propounded for widening the bridge by projecting iron footways, really a sort of mantel-shelf, extending along each side, and supported upon the present arches. The ugliness of this was strongly resented by architects and others, and the scheme was defeated in Parliament. Two years ago the increased revenue due to the falling in of the leases in Finsbury Circus and London Wall, on property held in trust for the Thames bridges, led the Corporation to again consider if anything could be done with advantage to London Bridge. Enquiry showed that, while the Tower Bridge had relieved the vehicular traffic of London Bridge, the foot passengers were more numerous than ever, and that it is the footways which chiefly need extension. The idea of widening the carriage-way so as to allow six instead of four lines of vehicles was abandoned, and the City Surveyor and the resident engineer of the Tower Bridge, Mr. Cruttwell, suggested a scheme which, like that of 1879, extended the footways over the water on the "mantel-shelf" principle.

The new scheme (a plan and section were published on page 341 of our issue for November 28th, 1900) provided for stonework in harmony with the structure of the bridge, and passed through Parliament without opposition. It widens the bridge from 53ft. to 65ft., thus giving about 6ft. additional width to the footways on each side. The projecting part of the footway will end in a cornice supported by granite corbels, and surmounted not by a solid stone wall like the present one, which would be too heavy to place on the outer edge of the shelf, but by an open stone balustrade. Steelwork will be used to aid in supporting the footway and to assist the bolting of the corbels to the main structure, but this will be buried under the pavement and will be invisible. Owing to the substitution of a balustrade for the present heavy stone wall, the new work will only add 67lb. per sq. ft. to the weight thrown on the foundations of the bridge. As the clay bed of the river will not be disturbed, Sir Benjamin Baker, the eminent engineer, considers that the increased weight is too trivial to need the slightest consideration.

THE SMOKE NUISANCE

AND THE DECAY OF LONDON BUILDINGS.

THE London County Council have recently issued the annual report of Mr. Alfred Spencer, the chief officer of the Public Control Department. One portion of this report deals with the smoke nuisance.

The Public Health (London) Act, 1891 (sections 23 and 24A), makes it an offence to use a furnace in premises used for trade purposes so constructed as not to consume its own smoke, or to use a furnace so negligently that the smoke arising therefrom is not wholly consumed. Section 24B declares a chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance, to be a nuisance within the meaning of the Act.

Sections 23 and 24A, however, are so crippled by qualifying words that it is very difficult to obtain convictions under them. The only provision that is really valuable is section 24B, which deals with black smoke, and probably this is the only part of the smoke sections of the Act (except the sub-section dealing with river steamers) which is enforced in London. Smoke of other colour than black may, and does, when it is discharged in considerable volume cause very serious nuisance. In addition to this limitation on the powers of a sanitary authority for dealing with smoke nuisance the statutory procedure involves much unnecessary delay. Two successive formal notices have to be served before any liability to penalties is incurred, so that for a time nuisance can be continued with impunity.

The Council has no direct control over smoke nuisance, the duty of enforcing the provisions in the county of London resting with the various Metropolitan borough councils, who are the sanitary authorities under the Acts. Under section 100, however, the Council has a general power of acting where a sanitary authority is in default, and the Council's inspectors of explosives and coal officers have therefore been instructed to report any nuisance from black smoke of serious duration which comes to their notice in the course of their other duties.

More than a Thousand Cases in One Year.

This instruction has been in force since June, 1892, and under it evidence of 5,436 cases of smoke nuisance has been furnished by the Council to the various sanitary authorities in London. Of these, 1,018 cases were reported during the twelve months from April 1st, 1900. This is an increase as compared with the previous year, and is alleged by manufacturers to be due to the difficulty in obtaining supplies of smokeless coal. The Council has not had to act in default, although it was necessary to warn one sanitary authority that unless action was taken against a certain offender the Council would have to proceed in default. The local authority, however, took the necessary steps, and the nuisance was abated.

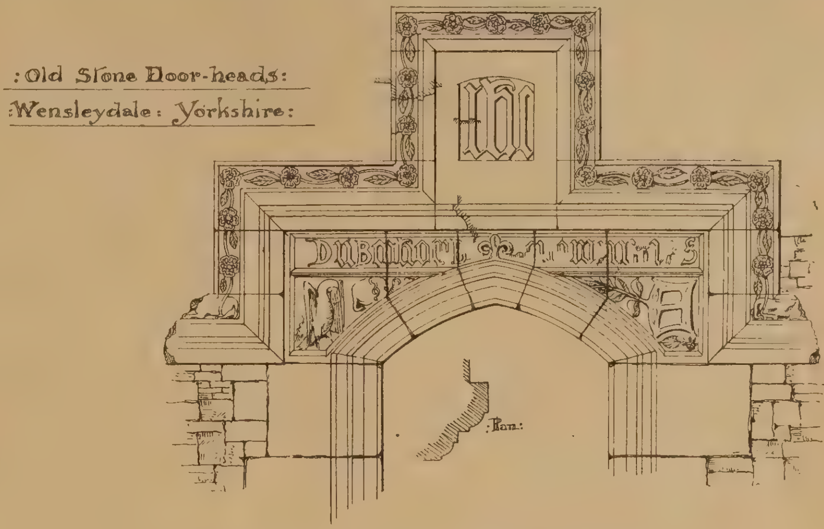
Altogether, the Council has put into force its powers under section 100 of the Act in respcct of smoke nuisance in fourteen cases, but in only two of these cases has legal proceedings followed against the occupiers or owners of the offending premises. In the remaining cases either the sanitary authority has itself at the last moment initiated proceedings or the nuisance has been abated on the service of the Council's statutory notice. What appears to be wanted is a power to the Council to act independently of the sanitary authority in cases of smoke nuisance. In this connection it is desirable to draw attention to section 12 of the Public Health (London) Act, 1891, which is as follows :—

"Complaint of the existence of a nuisance, liable to be dealt with summarily under this Act, on any premises within the district of a sanitary authority, may be made by any person, and thereupon the like proceedings shall be had with the like incidents and consequences as to making of orders, fines for disobedience of orders, appeal and otherwise, as in the case of a like complaint by the sanitary authority."

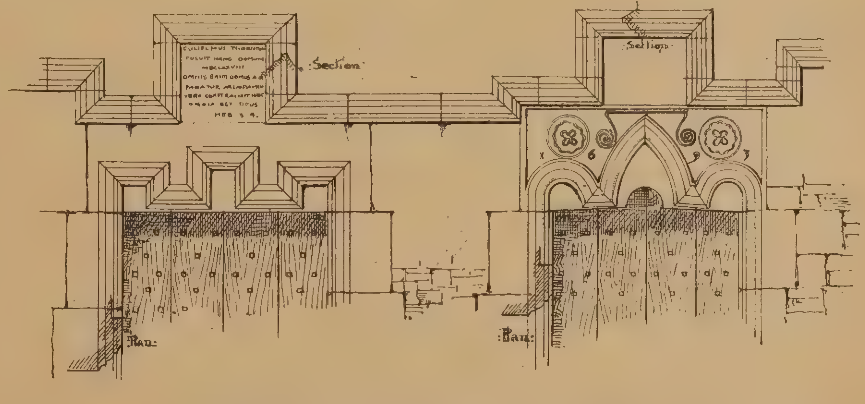
This section is a consolidation and extension of powers contained in the Nuisance Removal Amendment Act, 1860 (section 13) and the Sanitary Law Amendment Act, 1874 (section 59). Prior to the passing of the Public Health (London) Act, the power of acting independently of a sanitary authority under the last-mentioned sections was confined to "aggrieved persons." Now this restriction has been removed, and "any person" can put into operation the powers given by the section.

Mr. Spencer has endeavoured to collect particulars as to the statutory proceedings taken by the various sanitary authorities in the county of London in respect of smoke nuisance between April 1st, 1900, and March 31st, 1901. From five boroughs he has not been able to obtain particulars, but in the remainder he finds that in all 241 statutory notices were served, which were followed in 123 cases by legal proceedings, resulting in convictions in 102 cases, with penalties amounting to £454 16s.

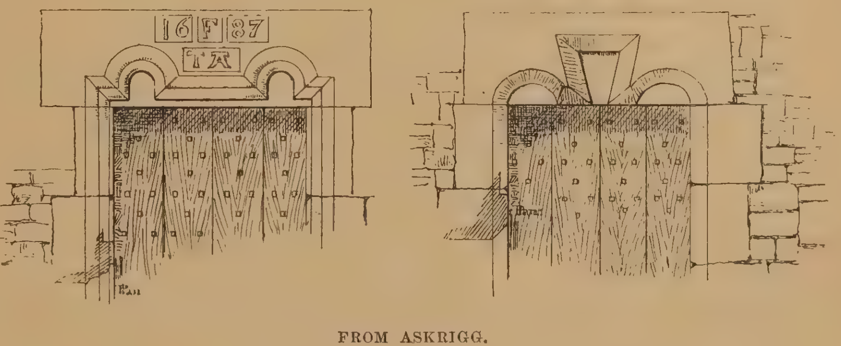
Having regard to the amount of smoke nuisance reported in the same period by the Council's officers, this return does not appear to adequately represent the number of convictions that might have been obtained. On the other hand, it is possible that, as already pointed out, a great deal of smoke was emitted while the cumbrous machinery provided by the law was being got under way. Mr. Spencer finds that in this respect London is in a far worse position than some of the provincial cities and towns, as *e.g.* Glasgow, where nuisance from smoke is an offence immediately punishable in a court of summary jurisdiction.



FROM COVERHAM ABBEY: ABBOT'S LODGINGS.



FROM THE ANCIENT HOUSE OF THE THORNTONS.



FROM ASKRIGG.

The Effect of Smoke on Westminster Abbey and Lambeth Palace.

Apart from the injury a smoky atmosphere causes to health and comfort, the damage to stone buildings in London is considerable. Few building stones will stand the London smoke for any great length of time, and the ordinary limestones which are mostly used for building purposes are found to decay very rapidly.

Complaint has been made from time to time of the decay of Lambeth Palace and Westminster Abbey, the decay being largely attributed to the fumes of hydrochloric acid emitted in the salt-glazing process at the Lambeth potteries. Acting on the instructions of the Committee, Mr. Spencer investigated the subject, and found that considerable care is taken to minimise the emission of the acid fumes and smoke from the potteries, and that experiments are continually being made to effect further improvements in this direction. The Chief Officer also found that the number of salt-glazing kilns, which alone emit acid fumes, has been considerably reduced in recent years, and that a still greater reduction had been made in the quantity of salt and coal used in the kilns. The proprietors of the potteries contend that the emissions of acid fumes are now so slight as to be quite powerless to cause injury either to stone or plants, and they point to the flourishing condition of the trees and shrubs on the Albert Embankment and in Lambeth Palace Gardens as affording conclusive proof of the correctness of their statements.

There is no doubt that in some portions of Lambeth Palace and Westminster Abbey the decay is very serious. In order to ascertain whether this could be attributed to hydrochloric acid fumes, analyses were made of portions of the decayed stone. The result showed that only a very small percentage of hydrochloric acid or its compounds was present; certainly not more than the normal percentage found in similar stone in other buildings in towns. In addition to this, an examination was made of about a hundred old stone buildings in various parts of London. It was found that nearly all these buildings also showed signs of decay as serious as that at Lambeth or Westminster. From this it would appear that the decay of the stonework of Westminster Abbey and Lambeth Palace is not more serious and rapid than that of other stone buildings in London. Moreover, before the Lambeth potteries were established, attention had been directed to the bad condition of the stone on the outside of Westminster Abbey, and Sir Christopher Wren stated that "the stone is decayed 4in. deep, and falls off perpetually in great scales."

Having regard to these facts it is reasonable to infer that the decay of these buildings cannot be specially attributed to fumes from the potteries, but is due partly to the great age of the buildings, the natural decay of which has no doubt been accelerated by the generally smoky atmosphere of London, and partly to the fact that much of the stone used is not well suited to resist such an atmosphere.

The Hackney Polytechnic Competition has been decided in favour of Mr. A. W. Cooksey, A.R.I.B.A. The assessor was Mr. Thomas Blashill, and Messrs. A. W. S. Cross and E. W. Mountford, were the only other competitors. The cost will be £50,000.

The Industrial Art of Paris continues to make great progress, and the municipal authorities encourage Parisian craftsmen in a generous way. The latest boon granted to the workmen artists is a salle in the Musée Galliera to be devoted to the art works of the ouvriers of the Faubourg Saint Antoine.

A New Market Cross and Drinking Fountain at Hexham has been erected in the Market Place. There is a large moulded trough, the stone for which was obtained from Heworth, county Durham. Connected with this trough is a smaller one for dogs. Rising from the centre of the trough is the fountain proper. On the four sides of it are copper plates of repoussé work. On the north side is a grotesque bracket, from which will flow a constant supply of pure water. At each of the four angles is an ornamental lamp (resting on wrought-iron foliage work), with copper tops and glass globes, under an ogee moulded canopy. The body of the fountain is of Cumberland red stone (which has been obtained from the well-known Harraby Quarries, near Carlisle) and is replete with carved work. There are carved pilaster panels with Ionic capitals. Above the pilaster are three lions rampant guardant. Over and above the pediments which surmount the Ionic capitals are heraldic panels filled with the coats or arms of the sees of York, Durham, Newcastle and Carlisle. Above these is a small moulded dental dome, and surmounting the whole in a stone cross. The architect for the work is Mr. W. H. Knowles, F.S.A., Newcastle. The stone carving has been executed by Mr. G. W. Milburn, sculptor, Bootham Bar, York: and the foundation has been erected by Messrs. J. Herdman & Son, builders, of Hexham.

THE OFFICE OF WORKS.

A VIGOROUS CRITICISM.

THE EARL OF WEMYSS, who has had sixty years' experience of public life, says that in all that time he knows nothing to equal the present unjustifiable exercise of casual, temporary, executive authority by the Office of Works with regard to the new public offices in Whitehall. Thus the War Office is now being proceeded with—*vide* the scaffolding, &c., in process of erection on the intended site—regardless of the request that models of the proposed buildings should first be made and publicly exhibited in accordance with time-honoured precedents. The Professor of Architecture (Mr. Aitchison), the Royal Institute of British Architects, the council of the new city of Westminster, and, lastly, the House of Lords, each in their several ways have expressed their desire that by means of models—the only safe and sure way—the public may be placed in a position to judge the public buildings their public servant at the Office of Works is about to erect at their—the public's—expense. The resolution to this effect was independently carried against the Government by forty-one to twenty, and when the minority is analysed it is found that all, save three, are in some form or other members of the Ministry, and of these twenty-two at least would (if free) have voted with the majority. The Earl of Wemyss now asks all interested in good government to say whether or not this is the way in which the public should be treated by their paid servant, who thus absolutely ignores public opinion in a matter æsthetically so vital to the Metropolis. And what, asks the noble Earl again, is the architectural qualification of the present autocrat of the Office of Works who thus abuses his casual official position? Before his appointment was he ever heard of as an architectural authority whose opinion would weigh against professional authorities such as those referred to, and justify his ignoring in his procedure alike their advice and the wise practice of centuries and of all civilised nations in the use of architectural models? Earl Wemyss owns to never having heard of his being previous to his appointment an authority on such matters; and he hardly thinks that successful action as the Conservative Whip in the Commons necessarily fits a man for the First Commissionership of his Majesty's Office of Works. But as it is in the present so it has been in the past. Men are sent to the Office of Works, not on account of their special fitness for the work they have to do, but as a matter of political convenience or necessity in the card-shuffling necessitated by the construction—not of buildings—but of Ministries. Now, surely this is wrong—very wrong—and in some form or other we should have Parliamentary security against abuses of power such as that from which we are now suffering on the part of the Office of Works, and which will make our aftercomers curse a system that has thus led to the neglect of needful precautions in dealing with the greatest opportunity in recent times of architecturally embellishing London. One thing as regards the future we can do, says Earl Wemyss, and that is appoint a permanent Royal Commission to whom all designs for public buildings, public monuments, or plans for the mutilation of our parks shall be submitted, and if approved be exhibited in model for public criticism before they are finally adopted. Further, all railway or other works in the Metropolis requiring the sanction of Parliament should as regards their design be equally submitted to the same permanent Commission as a security against engineering monstrosities in the shape of railway bridges and stations such as now unfortunately disfigure our previously beautiful Metropolitan river.

When, therefore, Parliament reassembles Earl Wemyss purposes, D.V., to move an address to the Crown praying for the appointment of such a permanent Commission, and he confidently looks for support from those peers who have, alike by memorial to Lord Salisbury two years ago—signed by 140—and by the recent division in the Lords shown their independence and practical interest in matters so materially affecting the Metropolis as the character of our public buildings.

SANITARY INSPECTORS IN CONFERENCE.

THE Autumn Conference of the Sanitary Inspectors' Association opened on Thursday last at Carpenters' Hall, Throgmorton Avenue. The chair was taken by the president, Sir Hugh Gilzean Reid, who in his opening speech said that the object of the Association was to raise the standard of the profession, protect its interests and extend its powers and privileges. He referred to the Bill introduced in Parliament to secure fixity of tenure for sanitary inspectors and medical officers of health, and congratulated the Association on having for the first time elected a lady member.

Sir Alexander Binnie, late engineer to the London County Council, read a paper describing the main drainage system of the Metropolis, with its network of sewers and intercepting sewers leading to the outfalls below London at Abbey Mills and Crossness. The difficulty of the work was increased by the fact that 12 sq. miles of Central and South London is below Thames high-water mark. The sewage is first treated with chemicals and its heavy matter allowed to sink, the remainder flowing into the river and being so pure that it makes the Thames water clearer than before it enters. The condition of the river has marvellously improved since the system was begun. The heavy deposit or sludge is taken out by ships and cast into the sea twenty miles beyond the Nore. He also referred to the experiments which are being made with a view to eliminating dissolved impurities from the effluent water by bacterial filtration.

In reply to questions, Sir Alexander said that the 4,000 or 5,000 tons of sludge daily sent to sea was useless as a fertiliser, its manurial value having been washed out by the water in which it came down the sewers. The Council had spent thousands in trying to make manure of the sludge, only to find that the stuff had to be burned after all. If the Council had control of London's water-supply it would greatly help them to deal effectively with sewers.

A paper by Professor Clowes, chemical adviser to the Council, was read on the bacterial treatment of sewage, by which after its solid matter has settled the remaining water containing dissolved organic impurities is passed through tanks full of coke. On the surface of the coke bacteria collect and liquefy and render inodorous the organic matter in the water. At present the system, which would be very costly, is only in operation on a small scale as an experiment. The older the coke beds the more efficient their action.

A paper by Mr. Prim, late resident engineer of the Houses of Parliament, was read on the system of ventilating, heating, cooling, lighting and draining those buildings. It was mentioned that at the close of the debate on the Home Rule Bill of 1886 there were in the chamber of the House of Commons 905 persons, and that the ventilating arrangements supplied every person with 1,326 cubic ft. of air per hour, or 22ft. a minute.

A curious story was told by Sir Alexander Binnie during the discussion on sewage treatment. Such is the destructive action of bacteria on sewage, he said, that even a cesspool is a bacterial filter and will empty itself if left long alone. When the King (then Prince of Wales) had been ill of enteric fever a searching enquiry was made into the drainage of his residences. It was found that Marlborough House drained into the old vaults of the nunnery formerly standing on the site. Although this condition of things was very offensive, it was noticed that the vaults had not been filled up by long years of use, bacterial action having constantly diminished the contents.

In the evening a dinner was held at the Holborn Restaurant.

On Friday a trip was made to Crossness and the Blackwall Tunnel, and on Saturday the drainage of the Houses of Parliament was inspected and a visit paid to Southend.

A Cookery School.—The Liverpool Training School of Cookery and Technical College of Domestic Science has been rehousing itself. New premises have been built in Colquitt Street from designs by Messrs. Pain & Charles Blease, architects, of North John Street, Liverpool.

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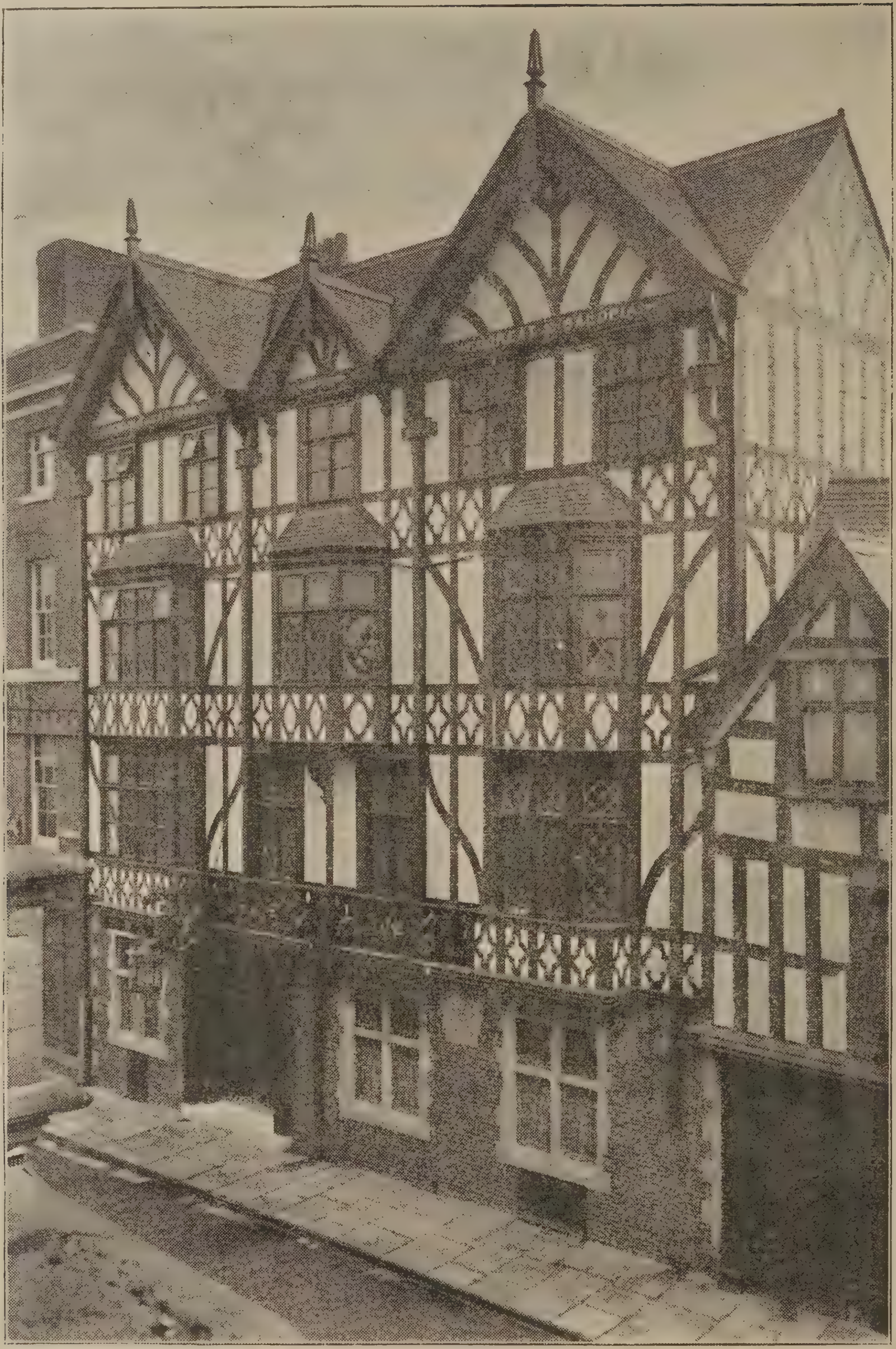

THE CROWN HOTEL, SHREWSBURY: MAIN ENTRANCE.
Sidney Gingell-Jones, Architect.

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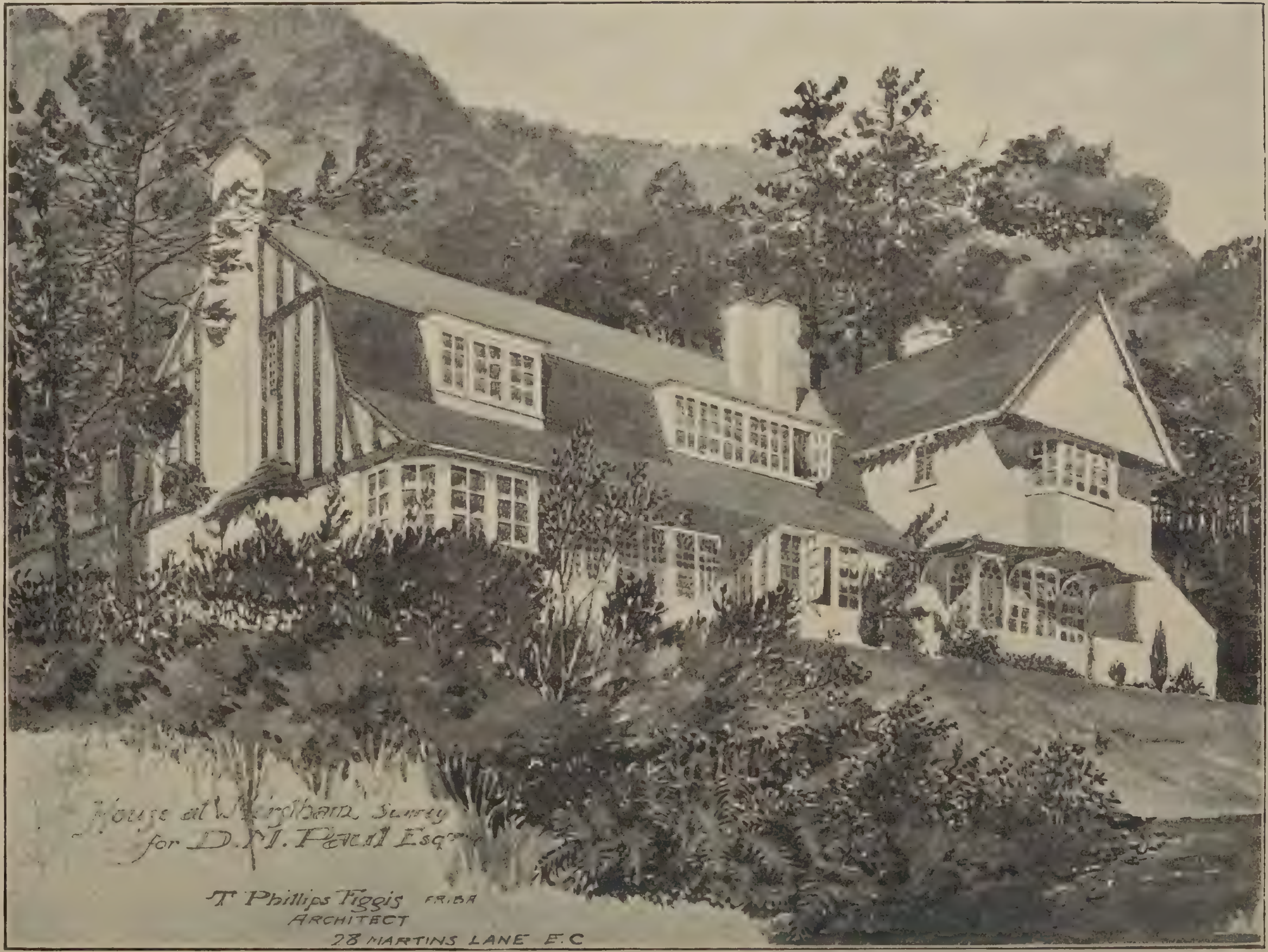

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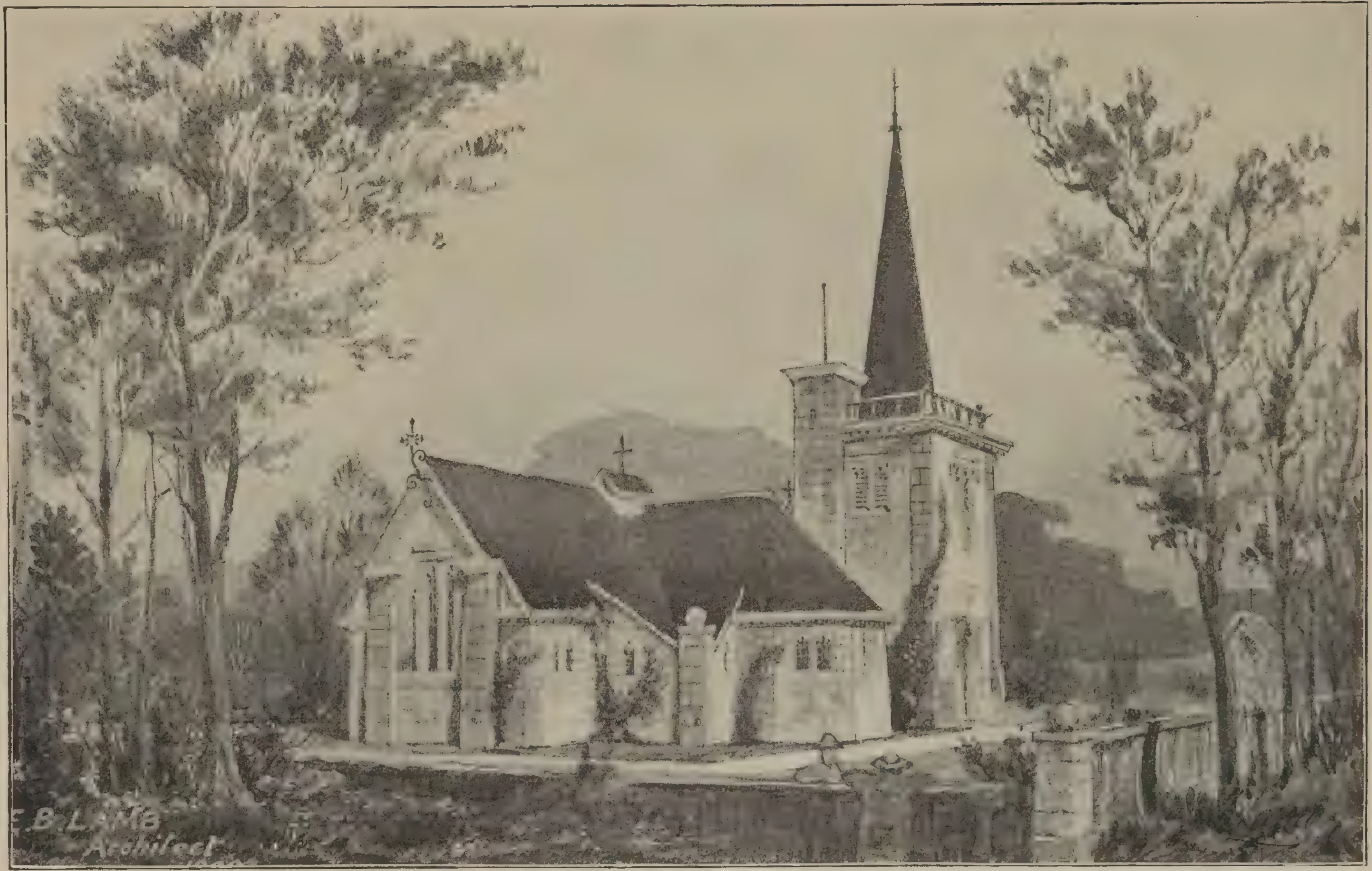

A PRIVATE CHAPEL IN A NOBLEMAN'S PARK. E. B. LAMB, Architect.

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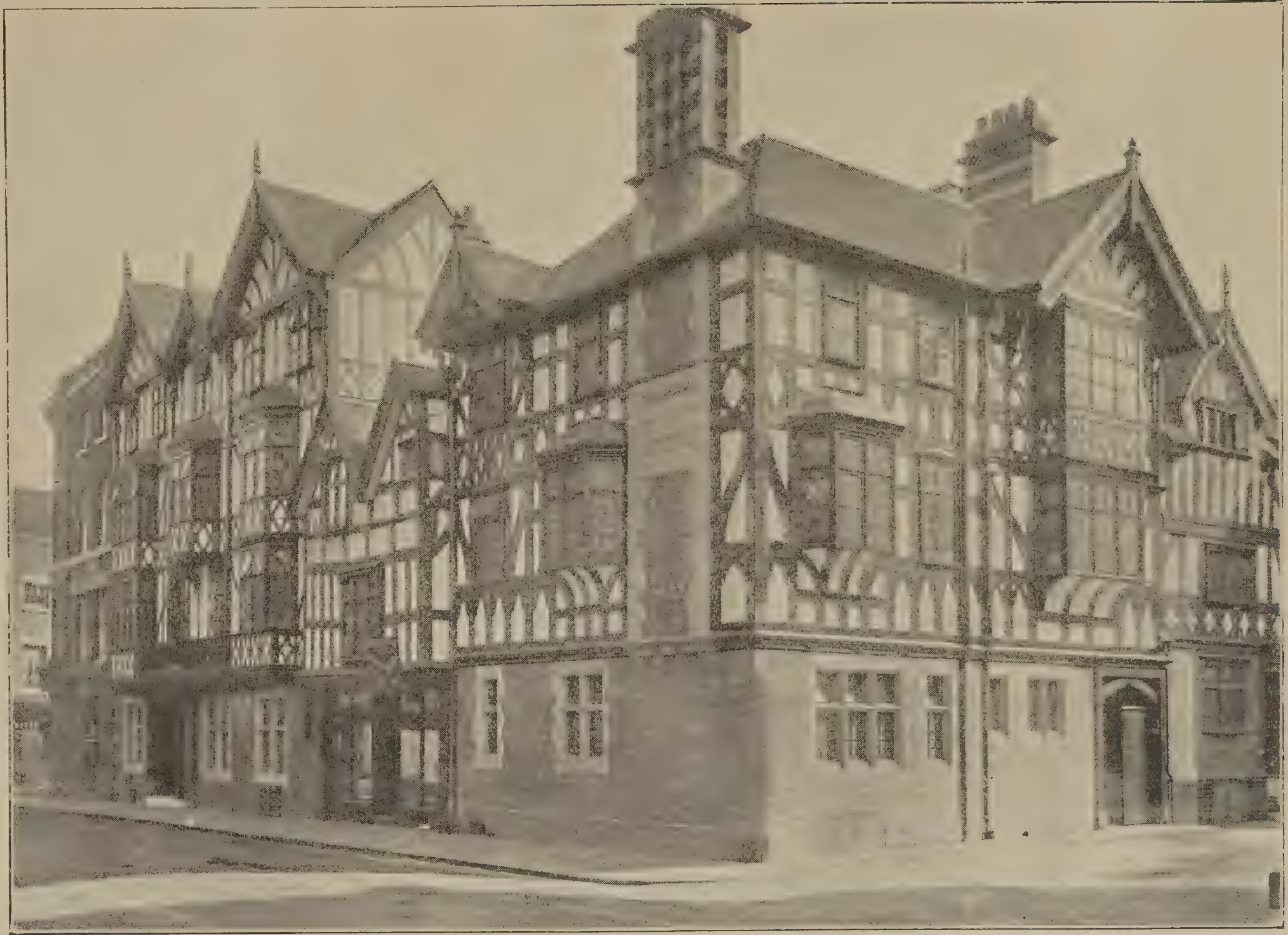

GENERAL VIEW OF THE CROWN HOTEL, SHREWSBURY. (The Corner Building was designed by the late J. R. Withers, Architect.)

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ST PAUL'S.

An Explanation about the Underlying Water.

In a letter to the "Times" with reference to St. Paul's Cathedral Mr. G. Johnstone Stoney says :—

The important information given in your columns by Mr. Somers Clarke, the architect to the Dean and Chapter of St Paul's (see page 536 of our issue for August 14th), indicates that the foundations of the cathedral were carried by Sir Christopher Wren through an upper layer 15ft. or 16ft. thick consisting of the débris of old London. In the lower part of this layer the foundations were spread out to enlarge their foothold on the next stratum underneath, which is a thin layer of "pot earth" varying from 4ft to 6ft. in thickness.

It would appear from the facts as described by Mr. Clarke that the subsidence which has been going on more or less since the cathedral was built is to be mainly attributed to the removal and rearrangement of material by water, and chiefly by the water travelling sideways through the lower part of the layer of sand and over the upper surface of the London clay.

The Action of Water Travelling over Sand.

Water making its way along a layer of sand or gravel resting on clay acts in three ways. Such water is always charged with carbonic acid (and in this case probably with other solvent agencies), whereby parts of the constituents of the grains of sand and pebbles that it meets with are dissolved. Even pure water is able slowly to dissolve silicates. These chemical actions are what make the water where it oozes from such a stratum more or less hard. The percolating water is also constantly engaged in rearranging, however slowly, the pebbles and grains of sand between which it makes its way, and it slightly washes away the surface of any clay over which it travels. It is evident, too, that the subsidence to which these events give rise is likely to be more in some places than in others, thus doing all the more mischief.

Prevention Better than Cure.

It is evident, then, that if we can prevent any water from having access to the layer of sand, the chief cause of the subsidence which has been going on will be removed. The layer of pot earth which lies over the sand, being thin, is probably not in all parts impervious to water, and surface water may reach the layer of sand through it. But the greater part of the supply probably comes from the slow horizontal travelling of water which always takes place in a nearly horizontal porous stratum which has clay or other impervious material under it. The direction in which this subterranean water travels in that part of London is probably known, and at all events can be ascertained. It probably is from the north and east towards the south and west. If so, it would probably not be impossible to intercept the inflowing water, and carry it round, instead of under, the cathedral by a deep-seated sewer to the north and east of the cathedral ; and also to guard the layer of sand under the cathedral from surface water percolating downwards. If all water can be kept from having access to the part of the porous stratum which is under and near the cathedral, we may reasonably expect that further change in this layer will be prevented. and that the subsidence of the cathedral, so far as it is caused by this, which is probably the chief cause of the subsidence, will be arrested. It is evident too that deep-seated excavations like those of the District Railway and Central London Railway may, so far as their influence on the flow of water is concerned, have either a useful or a prejudicial effect—useful if they tend to intercept water which would otherwise ooze into the sand under the cathedral, prejudicial if they lie on the other side of the cathedral and drain away water from the layer of sand, thus increasing the flow of water through it.

The present letter does not take account of another possible cause of subsidence, viz., the squeezing out laterally of the London clay when tunnels at some distance from the cathedral are made through it. The effect produced in this way is probably of trifling amount, and moreover sufficiently uniform to lead to a tolerably equable subsidence of the whole building. A subsidence of this kind does little harm.

Correspondence.

The Site for the Queen Victoria Memorial.

To the Editor of The Builders' Journal.

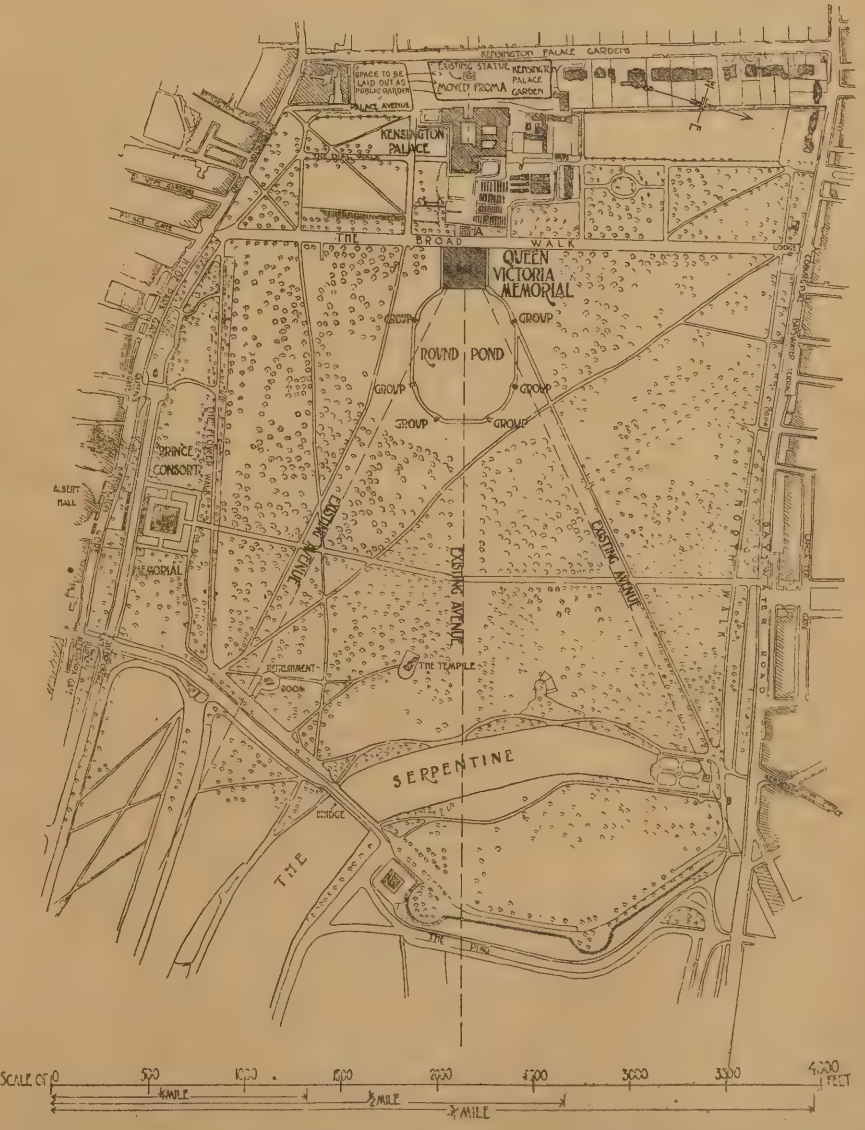
Sir,—I have been urged, even at the eleventh hour, to bring under your notice an alternative site for the Queen Victoria Memorial—on the elevated plateau in front of Kensington Palace—which about a month ago I ventured to suggest to an important member of the Memorial Committee. The accompanying plan, reduced from the Ordnance sheet, shows the site in question. With its converging avenues, fine sheet of water, open space, and endless ornamental possibility (without the sacrifice of a single tree or altering in any way the present character of Kensington Gardens), this site is of unequalled importance and beauty. Further, its special fitness for the Memorial to the late Queen rests on her having been born at Kensington Palace—where her toys are still preserved—while it was there she was told of her succession to the Throne. No such associations gather round Buckingham Palace. I am therefore not without hope that you may be induced to give the subscribers and the general public, as is just and right, an opportunity of judging as to the relative fitness of suggested sites for the National Memorial to our great Queen.—Yours truly. WEMYSS.

[It is to be regretted that Lord Wemyss did not make his suggestion earlier. We fear it is too late now for this site to be entertained.—Ed. B. J.]

THE ARCHITECTURAL ASSOCIATION.

THE SESSIONAL PROGRAMME.

We have just received the curricula of the Architectural Association for the Session 1901–2. Here for the first time appears the syllabus of the new day school of the association, of which we have already published particulars. The opening meeting of the session will be on Friday, October 11th, when the president, Mr. W. Howard Seth-Smith, will deliver his address and distribute the prizes awarded last session. The papers to be read are of the usual interesting character, and consist of the following : Mr. A. Wood, M.A., F.S.A., on "Cambridge in Early and Mediæval Times," Mr. Max Clarke on "The Sanitation of a Country House," Mr. Francis Bond, M.A., on "Capitals," Mr. J. E. Forbes on "Travelling Students' Notes," Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century," Mr. T. C. Cunnington on "Architectural and Constructional Engineering," Mr. C. Harrison Townsend on "Originality in Architectural Design," Miss Ethel Charles on "A Plea for Women practising Architecture," Mr. James Miller on "The Glasgow Exhibition," Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough," Mr. W. D. Caröe on "The Preservation of Ancient Buildings," Mr. E. A. Gruning on "Arbitrations," Mr. Owen Fleming on "Artizans' Dwellings from the Municipal Point of View," and Mr. Louis Ambler on "Artizans' Dwellings from the Private Point of View. " The following papers have been arranged for in the Discussion Section : Mr. H. Gregory Collins on "Stables and Stable Fittings," Mr. W. E. Davis on "The



New site for the Queen Victoria Memorial, suggested by the Earl of Wemyss.

Finishing of a Dwelling-house," Mr. Vivian H. King on "Designs in Furniture," Mr. Sydney Perks on "The Ethics of Dilapidations," Mr. H. Howard Humphreys on "The Manufacture, Testing, and Uses of Portland Cement," Mr. P. W. Mulready on "The Work and Influence of Augustus Welby Pugin," Mr. F. G. W. Buss on "The Clerk of Works, his Duties and Responsibilities," Mr. J. Dudley Forsyth on "Stained Glass," Mr. F. C. Eden on "The Organ: Its proper Position and Architectural Treatment," Mr. T. H. Russell, M.A., on "Dartmoor Granite," Mr. H. C. Lander on "Co-operative Homes," Mr. A. Needham Wilson on "A Tour in the South of France."

LONDON FLATS.

The Opinions of Two Medical Officers of Health.

THE subject of London flats and their relation to health, which is referred to in the letter by Dr. Bridges published on page 545 of our issue for August 14th last, is receiving increasing attention.

"Flats," says the "Daily News," "are a great subject. They are multiplying enormously. Rich and poor alike have taken to them. The working man calls his flat a dwelling. His well-to-do brother prefers the word 'mansion'; but, whatever be the name, the thing is imperatively demanded by the monstrous growth of the Metropolis."

Dr. R. Dudfield, the medical officer of health for Paddington, says that in many of the blocks of flats the buildings are so arranged that no proper accommodation is provided for the dustbin, while the accommodation available is often too close to the windows of the lower flats. Given these two sets of circumstances, the only remedy which will prove effective is a more frequent removal of dust. A daily removal is in force in many of the provincial and a few Metropolitan areas. Generally speaking, the rooms are too small and the system crowds people on to a small area. Flat life is particularly bad for children. They do not get enough air or light, and they miss the variety and exercise available by a garden or even a yard. There is another point to be considered. Blocks divided into flats are usually much higher than the ordinary house. That means a diminution of light and air for neighbouring buildings. Besides, even the better-class flats are sometimes built so that they have no through ventilation, and workmen's dwellings suffer still oftener in this respect. In both cases you find dwellings into which air and light can only enter at one side; so that there is very often a stagnant atmosphere and insufficient light in the rooms. It is true that in the high-class block you will probably find a central well, but even that is not a perfect arrangement, for though it may give the flats a certain amount of through ventilation it does not admit sunlight.

Dr. Sykes, the medical officer of health for St. Pancras, has studied the housing question earnestly for eleven years, and may be considered an authority on it, especially as St. Pancras is rich in flats of nearly all kinds. In March and April he gave at the Royal College of Physicians a series of lectures on "The effect of building on health in relation to the changing style of habitation." These discourses will shortly appear in book form.

The housing question, says Dr. Sykes, is quite different in London from what it is in other towns. Here it means flats; there it means cottages. If you want to build cottages here you have to do it on the outskirts, and he very much doubts whether the working people whose employment is in the centre of the town will travel so far. In Dr. Sykes' opinion the only way to get over the difficulty is to rebuild central London in flats, and that is what is happening.

Asked as to whether he thought that as regards health flats are all they should be, Dr. Sykes replied: "Certainly not. I say they are what they should not be, but they can be improved, and they ought to be, but the law will have to be altered. The London Building Act of 1894 was an attempt to improve matters, but in some respects it makes them worse. The landlords were too sharp for the County Council. Previous to 1894 rebuilding on an old site was accompanied by the restriction that a yard or other open space within the area must be left open, but since the passing of the Act it has been possible to build on such open spaces to a height of 16ft. This means less light and air. And the worst of it is that the landlord may reckon the height of his new building not from the pavement but from the top of the 16ft. structure. Even where he has not this special opportunity of diminishing light and air, the case is bad enough. The County Council fought to keep the height of buildings no greater than the width of the street. They only succeeded as far as artisan's dwellings are concerned. I am speaking of old streets. As for brand new ones, you have to go five miles out to find them. That is not all. The greatest injury to public health was done by the provision relating to spaces at the backs of houses and other buildings. The Act says that the height of a building may be twice as great as the width of the space at the rear, a provision most injurious to health.

"Even flats at £200 or £300 a year are not perfect from the point of view of health. They are often built round a central well, where the air is stagnant and no sunlight shines. The system is infinitely worse than the courtyard arrangement of France and Germany, because in those countries the central well or courtyard communicates with the street by means of a carriage-way. With regard to the want of through ventilation in flats, it is a difficult subject, but undoubtedly there is such a drawback and it ought not to be allowed. The fact is that many flats are practically back-to-back houses. It is a nice cheap arrangement for the landlord, but the result is that for each dwelling there is only light and ventilation from one side. I suggest that of every two rooms in each dwelling one should be on a front opposite to that where the other is situated.

"We want much more stringent regulations as regards flats; and, more important still, old houses let in tenements, a purpose for which they were not intended, should be converted into flats. While I condemn some of the things in connection with flats, I find the system infinitely better than that of tenement houses. There are examples of the two close together at Somers Town, and you can see at a glance that the flat-dwellers have much better health than the tenement-dwellers. Those that live in the tenements pay 6d. a week more for their rooms, and they are 1s. worse. The great solution of the housing question in London is to change the tenements into flats and insist on healthy conditions for the more modern system."

THE OXFORD MUSIC HALL.

THE Oxford Music Hall, London, has just undergone considerable alteration and redecoration. Under the superintendence of Messrs. Wylson & Long, the well known theatre architects, the interior has been entirely re-decorated. Changes have also been made in the colour of the upholstery, which has been carried out in Utrecht velvet of a deep rich crimson, instead of brown as formerly, while the old green tableaux curtains are replaced by others of crimson silk brocade, which, with corresponding draperies, form an effective stage *portière*. New carpets, of a similar colour, have been laid throughout the building, and the tones of the wall and ceiling decoration have been kept subdued, ivory and gold being the prevailing colours, relieved here and there by pale sea-green. A new feature in theatre-decoration is the liberal use of art metal from the workshops of Messss. Benham and Froud. The whole of the pillars are encased with hammered and repoussé copper, and the dados on the ground floor and in the balcony contain panels of rich gold metal. The existing saloons have been re-decorated, and a new crushroom is in course of construction in the balcony. In addition the stage has been considerably enlarged, and an extension has been made in Hanway Street in the shape of an additional exit for the audience, a stage entrance for performers and workers, and new dressing-rooms fitted with every convenience. Attention has been paid to lighting and ventilation; while a fireproof curtain has been fitted to shut off the stage from the auditorium.

Masters and Men.

A Strike in Camberwell has occurred of the whole of the workmen employed in the erection of the new Camberwell Infirmary, Havil Street, Camberwell, as a protest against the summary dismissal of two of their number.

The Penrhyn Strike.—Experts dispatched some months ago to inspect the recently discovered vein of slate at Smith's Sound, in Newfoundland, have reported so favourably that there is to be a large emigration of quarrymen forthwith from North Wales. The newly-opened quarry at Smith's Sound is already being worked by about thirty Welshmen, whose numbers will now be largely recruited from the dissatisfied quarrymen.

The Union of Carpenters and Joiners have opened a new branch in Burton. Mr. Elliott (president of the Derby branch) occupied the chair at the meeting for its formation, and with him were Mr. Matkin, J.P., Liverpool (general secretary), Mr. Gaskill, Mr. Potter, Mr. Shylock, Mr. Thomas, Mr. Seamer (secretary of the Derby branch) and Mr. F. A. Hill. Mr. Matkin, J.P., in a speech condemned the introduction of piecework. Mr. F. A. Hill was appointed secretary of the new branch.

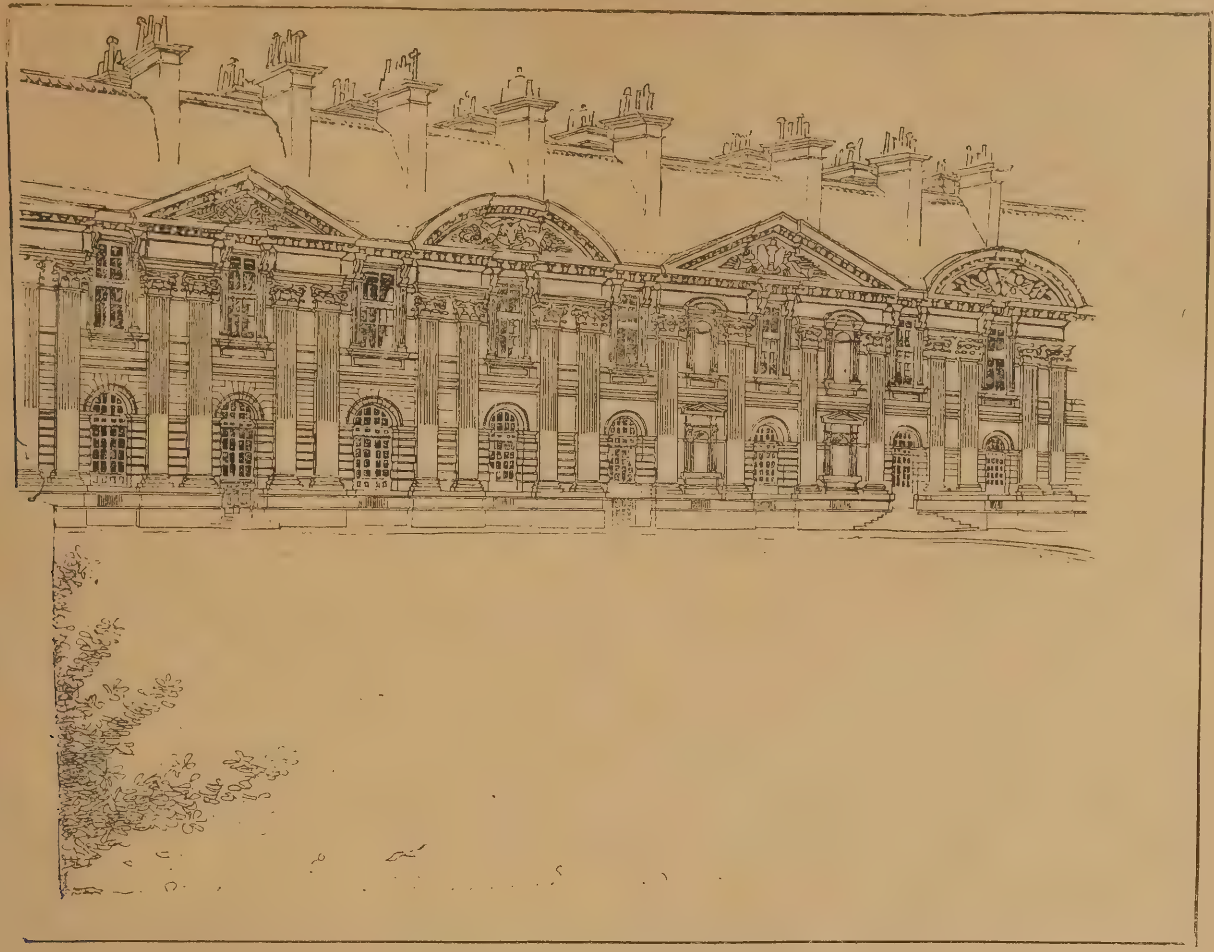
A Curious Sunderland Strike.—A number of painters employed in redecorating Christ Church, Sunderland, struck work last week because women were being employed to clean and scrub the seats. The contractor immediately called a meeting of the Master-Painters' Association, and they agreed to support him in resisting the strikers. As the work was urgent, they proceeded in a body fourteen strong to the church, where, in their shirt-sleeves, they took up the work abandoned by the men and completed the work in a few hours.

Newcastle Building Dispute Settled.—In the action of *Reid* v. *Sanderson*, which came before Mr. Justice Joyce in the Vacation Court, London, last week, by way of a motion to restrain the defendant from erecting a building in Newcastle, Mr. Bramwell Davies, K.C., said that the parties had now arranged matters. They had agreed that the action should be discontinued, the plaintiff having agreed not to take action against the defendant. The matter had been got over by the building being sold, and each party would pay their own costs.

The London Housing Problem and Workmen's Wages.—At the monthly meeting of the Metropolitan Radical Federation, held at Paddington, a discussion took place upon housing accommodation in London, when the following resolution was unanimously passed: "That, in view of the heavy cost of housing accommodation, and the continually increasing cost of living in London, the Federation is of opinion that no male adult labourer engaged and living within the Metropolitan area should be employed by the London County Council at a lower wages than 30s per. week."

NEW MASONIC HALL AT OKEHAMPTON.

THE new temple of Masonic Lodge Obedience, 1753, at the corner of Station Road, Okehampton, was dedicated last week. The new building is of stone, in the Renaissance style, with slated roof. Externally the structure is plastered, with rubber brick dressings, relieved by moulded wood; while the roof is surmounted by an ornamental turret, and there is an imposing elevation to Station Road. The accommodation comprises robing- and retiring-rooms, a lodge room 36ft. by 22ft. with a height of 18ft., a lavatory and the necessary offices. The entrance lobbies and corridors are furnished with tile floors, and all are provided with swing doors. The lodge room has an open roof, with a pitch-pine dado, and an ornamental mantel with eagle grate. The whole of the woodwork is tinted ivory. The premises are heated by means of open fireplaces, gas is laid on throughout and ventilation is provided in the roof. Muranese glass has been used throughout for the windows. The contractor was Mr. Sleeman, of Okehampton, who executed the work in accordance with the designs of Mr. J. A. Lucas, F.S.I., of Exeter.



THE LOUVRE, PARIS: FRONT TO THE PLACE DU CARROUSEL. PERCIER AND FONTAINE, ARCHITECTS. DRAWN BY H. F. COOKE.

BOY BUILDERS.

WHAT THEY ARE DOING AT FELIXSTOWE.

VISITORS to Felixstowe may be invited to take note of a building scheme now in progress there which is unique in its way and forms quite a remarkable instance of what can be accomplished by self-helpfulness and voluntary effort. At present the outward and visible sign of this enterprise is not very conspicuous. It consists of a half-finished edifice in red brick, with the scaffold-poles still around, standing on a plot of ground near the Bath Hotel stables. There is nothing to distinguish it from any ordinary work of the kind, but its interest lies in the fact that the boys of the place, helped in contributions of material by sympathetic friends, are here building for themselves what may be fairly called a "local habitation and a name."

In Old Felixstowe, somewhere near the old church, there is a village club and reading-room. Into this institute boys were once admitted, but they were eventually turned out by the adult members. This fact came to the knowledge of several ladies, and a meeting-place for the lads was found in a room kindly lent by one of these ladies. Within two or three weeks, however, the attendance was so large that further accommodation had to be looked for, and a move was made to the Felixstowe and Walton School, the members of the board granting the use of a room free of charge. Here, with some sixty names on the roll, the average number present each evening of the "session" was about thirty, and classes were instituted in numerous subjects—carpentering and building construction, chip carving, brushwork, clay-modelling, drawing, writing, arithmetic, Swedish drill, book-keeping, paper-designing, netting, physiology and singing. Amongst the students a few were careless or indifferent, but a great majority showed both aptitude and application. Some specimens have been seen of brushwork and of clay-modelling which prove that these boys, many of whom come straight "off the land," possess natural powers and capacities which it would be a shame and a waste to leave undeveloped.

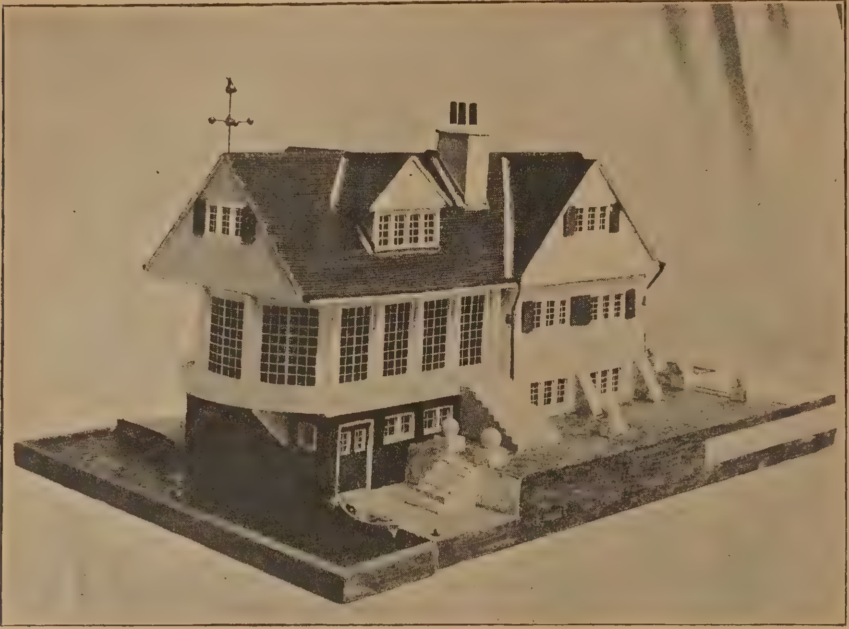
The feeling was generally entertained, however, that the accommodation provided at the Board schools was in some respects unsatisfactory; and the determination to have a club-house and home of their own took definite shape and form. This was largely due to the advice of Mr. Arthur Leggett, who, with Mr. Carter, conducted building construction classes; and at one meeting of the committee he brought out the somewhat startling proposition that the boys should undertake the construction of a suitable building under his supervision.

Mr. Felix Cobbold gave permission for the building to be erected on his land; Mr. G. W. Leighton prepared the necessary plans; Mr. C. A. Creasey, Mr. Woodmancey and Messrs. Bugg & Jolly provided bricks; Mr. F. W. Mason, the cement, lime, and timber; Captain Pretyman, M.P., shingle and tiles; Mr. Linzell, the "damp-course"; Mr. Fred Bennett, the scaffolding; Mr. Andrews, some appliances; Mr. H. P. Varley, Mr. Chalmers and Mr. Hyem did the carting; Mr. Harry Bennett undertook the roof work; and Mr. Napier Prentice has promised to instal the electric light. These were all the names mentioned, but the probability is that the list does not include every donor, and it should be said that by the express desire of the boys the proceeds of a very successful sale of their work during the winter was devoted to the same purpose.

The work of building was commenced early in the present season, and is for the present restricted to the erection of one room measuring 40ft. by 24ft. To this there will be added in future one or two classrooms and other adjuncts to a well-appointed club. At the present time the structure is ready for the roof-covering, and all the boys who have any notion of carpentering are working in Mr. H. Bennett's yard. As operations upon the spot are temporarily suspended, therefore, no sufficiently vivid conception can be formed of the voluntary labour that is now represented in solid bricks and mortar. Some boys have stuck to their self-imposed task for several evenings in each week and during the whole of Bank holidays; their friends, including one member of the district council at least, have from time to time dropped in to lend a helping hand; one of the ladies even has been seen on top of the scaffolding engaged in the rough task of laying bricks; and it is said that a visiting clergyman—now indisposed, unfortunately—evinced such an active interest in the work that he went through a brief apprenticeship to the business, starting right from the elementary task of learning how to mix mortar. Thanks to Mr. Leggett's oversight, too, the result of these amateur performances is highly satisfactory. The "courses" may not be quite so straight and perfect as those laid by skilled artizans; but the walls are strong and substantial, and the house will stand for many a year as a monument to the industry of the Felixstowe and Walton boys and the practical philanthropy of their friends and advisers.

It may be said in conclusion, as was hinted at to begin with, that there is probably no other place in the kingdom where the boys of the locality are building a club-house for themselves and where such a work is being carried through without payment of a single penny to those engaged in it. This notice was not written with any "begging" purpose, but further help and encouragement will be heartily welcomed; the hon. secretary is Miss Adams, who lives at "Langwarren," on the Bath Road, nearly opposite the site on which the new club-house is being erected. Visitors interested can inspect the building on Saturday afternoon, or after six o'clock on any evening except Wednesday. A notice board, on the right of the Bath stables, walking toward Felixstowe, indicates the site.

The Carpenters' Company are offering two free scholarships at King's College for building construction. The examination will be held on Thursday, September 26th, and candidates are required to send in their names before Friday, September 20th, to Mr. S. W. Preston, Carpenters' Hall, London Wall, E.C.

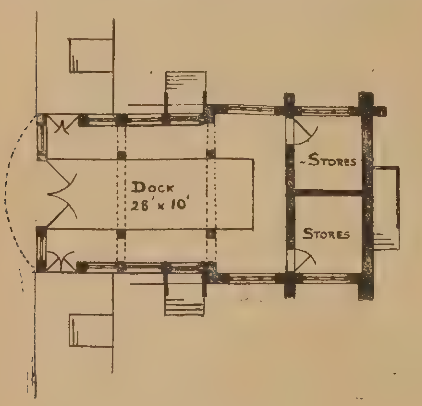


PROPOSED BOATHOUSE AT MAIDENHEAD FOR MRS. BROWN POTTER. LIONEL CRANE, ARCHITECT. (*Photo by Henry Irving.*)

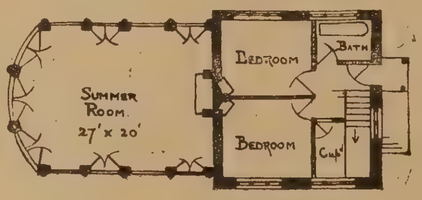
L'ART NOUVEAU AT SOUTH KENSINGTON.

"THE ARCHITECTURAL REVIEW" for September illustrates a number of the objects in the collection of "L'Art Nouveau" furniture, pottery, glass and so forth, which was recently given to the South Kensington Museum. Surprise is expressed that the authorities could have been brought to admit pretentious trash like this to the hospitality of a national museum. "The donor," says this magazine, "is Mr. George Donaldson, described as 'Vice-President of the Jury of Awards' in the Paris Exhibitions of 1889 and 1900. The notice in the gallery explains that Mr. Donaldson selected these objects in the recent Exhibition, and presented them to the Victoria and Albert Museum 'to show European developments in this direction to British furniture designers.' The British furniture designer has no need, one would think, to go so far abroad for examples of what to avoid in design. One can hardly suppose, however, that this was Mr. Donaldson's idea in buying and presenting the collection. But if he regards them as examples to be followed, what are we to think of the value of awards for design given by a committee of which this gentleman was vice-president? Not only are the things wretched in design and construction and indifferent in workmanship, but they are not even the typical and original examples of a bad fashion. They are the rinsings of the dish, the after-effects of the fantastic malady. The Belgian and French designers who started the fashion (on English inspiration) are not represented; we have merely the commercial hackneying up and down Europe of motives at a fifth, sixth . . . tenth remove from an unhappy original. The things, then, have no claim for their own sake to a place of honour; nor, even were South Kensington a pathological museum for design-disease, would they have any claim to attention as symptoms. Indeed, it would be a wholesome rule to be extremely stingy in admitting anything contemporary. Works of art ought to be filtered through the appreciation of a generation at least before they are taken into our museums. South Kensington, moreover, is not only a storehouse of art, it was intended to be a school for designers. Can anything be more deplorable than to set examples like these before our art students with an official stamp of approval? Art students are only too ready to catch up the most recent craze; this ill-bred 'new art' is offered to them from every corner in Europe by the art reviews; and the one or two weedy ideas that run through it sow fresh crops wherever the seed falls. Architecture itself is attacked by the disease, and in Germany and Austria queer goitred styles have sprung up in which some 'decorative' feature has swallowed constructive significance and beauty."

This indictment is a very heavy one when it is remembered that "THE ARCHITECTURAL REVIEW" is directed by an editorial committee composed of our most eminent and best-known architects, including Messrs. Norman Shaw, R.A., John Belcher, A.R.A., F. T. Baggallay, Reginald Blomfield, G. C. Horsley, Mervyn Macartney, E. J. May, Walter Millard, Ernest Newton, E. S. Prior, Halsey Ricardo, Leonard Stokes, Professor F. M. Simpson, and Mr. D. S. Maccoll, the well-known art critic.



PLAN AT WATER LEVEL.



GROUND-FLOOR PLAN.

Builders' Notes.

Smithfield Market to be Re-painted.—About fifty tons of paint will be used and some £12,000 spent in the painting of Smithfield Market, which is just going to be carried out by the Corporation. It is ten years since the market was last done, and it is estimated to take eight or nine months to finish the work. The predominant colours will be blue and yellow.

New Union Offices at Birkenhead.—The Board of Guardians have accepted the tender of Mr. W. H. Forde, builder, Birkenhead, to erect the new union offices in Conway Street, near the Haymarket, for £18,010. The total cost, including land, buildings, fittings, furniture and all expenses, including the architect's fees, will be approximately £24,000.

Taking Advantage of an Error in a Contract.—At a recent meeting of the Public Works Committee of the Merthyr Urban District Council a letter was read from Mr. J. Morgan, whose tender had been accepted for the erection of 100 workmen's dwellings at Penydarren, stating that he had made an error in the figures, which should have been £15,600. On the motion of Mr. D. W. Jones it was agreed that the contractor be compelled to carry out the work or that steps be taken to make him do so. The council, Mr. Jones said, had had a deal of trouble through contractors, after their contracts had been accepted, writing to get errors in figures amended.

Mr. Robert George Seaman, builder, of 2, Priory Place, Friars Street, Ipswich, met with his death last week by a fall from a scaffold. The deceased, whose business premises are in Crown Street, had a contract for the erection of two houses in Stirling Street. Besides personally supervising the work, Mr. Seaman himself took part in the building operations, and was so engaged when he met with the accident. Towards the end of the afternoon Mr. Seaman was putting up some troughing, and the staging upon which he was standing consisted of a plank, which rested upon a scaffold pole forming part of the scaffolding round the house, and a ladder. This seems to have suddenly fallen away, and Mr. Seaman, probably without warning, fell into the yard of an adjoining house, a distance of 16ft.

Mr. William Gibson, a well-known contractor, of St. Leonards, Exeter, died recently. He was born at Bankhead, in the parish of Monikie, county Forfar, on June 18th, 1853. He left Scotland at the age of sixteen and worked in Newcastle, afterwards going to London, where, at the age of nineteen, he was engaged on various large works. Six years later he went to Exeter and acted as foreman for Mr. Luscombe, in connection with the restoration of the Lady Chapel of Exeter Cathedral and other important undertakings, including the restoration of the castle front. Twenty-one years ago he commenced business for himself, his first contract being the new tower to Misbery Church, Essex. After this he took up contracts for the erection of villas in Tiverton Road and Union Road Exeter. He was also entrusted with large contracts in Devon, Cornwall, Somerset, Dorset, London, &c., while at the time of his death he had large works in hand at Weston-super-Mare.

Failures of London Builders.—In the London Bankruptcy Court last week the first statutory meeting under the failure of Messrs. W. Antill & Co., builders, of Mornington Crescent, Camden Town, was held. The partners were William Antill, A. W. Peterson, William Henry, and E. A. Young. The joint accounts showed gross liabilities amounting to £10,898, of which £10,211 were expected to rank, and assets estimated at £7,462, after providing for preferential claims. A resolution for bankruptcy was passed.—A first meeting of creditors was also held under the failure of John James Weibking, who carried on the business of a builder under the style of John Weibking & Sons, at 65, Southgate Road, also at Islington and Hoxton. The liabilities were estimated at £15,494, and the assets at £7,768. The debtor consented to an adjudication.—There was also a first meeting under the failure of Mr. R. V. Wellesley, a builder, of Shepherd's Bush. The liabilities were estimated at about £7,000, with assets of small amount.

Law Cases.

The Law Affecting Sun Blinds.—An important decision concerning the use of shop-blinds was given by Mr. Pitt-Lewis, K.C., at the City of London Court last week. Messrs. Diviani Brothers, restaurateurs, 157, Fenchurch Street, E.C., sued Mr. Gay, farmer, Eastbrook End, Essex, for £10 15s., damage caused to a sun-blind. In July last one of defendant's large vegetable waggons was returning from the Borough Market through Fenchurch Street, and as it passed the plaintiffs' shop it pulled the sun-blind down, damaging the facia and smashing the blind. The roadway was up at the time, and that confined the space reserved for vehicular traffic. The defendant's case was that the plaintiffs' blind, in coming down to within 14in. of the curb, was brought too near the roadway, and that the plaintiffs had only themselves to blame. The plaintiffs said that the regulations of the City authorities allowed them to do so, and that their blind was not a public nuisance as alleged. It had been in use for fourteen years. Mr. Hohler, defendant's counsel, said that the blind should have been within 2ft. of the curb, and not 1ft. Sergeant Tucker, of the City Police, said that blinds might come within 1ft. of the curb, but District-inspector Watson said there was no such rule. The deputy judge said when the streets were dedicated to the public use the shopkeepers had a right to use sun-blinds so long as they did not become a nuisance. The plaintiffs' blind was not a nuisance, as it had been in the same place for fourteen years. He was sorry for defendant's driver, as he did not believe he was guilty of carelessness. Accidents would happen, and it was all the result of the roads being up. Nowadays the roads were always up. The rights of electrical companies and the like were preferred to the public convenience, but it could not be helped. In the meantime the defendant's man had done the damage, and there must be judgment for the plaintiffs with costs. He refused leave to appeal.

WASSENAAR CASTLE, HOLLAND. C. MUYSKEN, ARCHITECT.

The Sale of Two Houses: Alleged Fraud.—At the Coventry County Court recently an action was brought by Mathew Dodwell, of Coventry, against Enoch Green, chief building surveyor to the Birmingham Corporation, to recover damages for concealment of a material fact which, it was alleged, defendant ought to have disclosed on the sale of two dwelling-houses in Berkswell. The amount of the claim was £26 13s. 2d. The plaintiff bought the houses at a public auction, and they were conveyed to him on July 26th, 1900. Before the date of the contract defendant received a notice from the inspector of nuisances to the Meriden Rural District Council requiring him to clean out the ditch into which the property drained and to construct a dumb-well. This was not complied with. The defendant, through his solicitor, was asked in writing: "Has the vendor or his solicitor received any notice from the sanitary authority requiring any work to be done?" and the reply was "No." Plaintiff had since carried out these works, and the cost of these was the amount of the claim. At the time the villas were built the Meriden Council had made no building by-laws, and the defendant laid the drains of his house into the road ditch. Up to that point the Council could not interfere, but as soon as the drains were used a nuisance was created. On the suggestion of His Honour the claim was amended to that of an indemnity in respect of work which had been done since the completion of the purchase. Defendant said he never intended to swindle plaintiff out of a farthing. He even offered to pay £5 towards the cost of the work. He did receive a letter from the inspector of nuisances asking him to clean out the ditch, but no mention was made of a dumb-well. His Honour pointed out that the letter which the inspector of nuisances was said to have written to defendant was not forthcoming, that there was a difference of opinion between defendant and the inspector of nuisances as to its contents, and that in the absence of the document there was nothing to show that defendant had been guilty of fraud. He accordingly gave judgment for defendant with costs.

Pulling down Dilapidated Buildings.—At the Birmingham Police Court John Cartwright was recently summoned to show cause why an order should not be made upon him to take down, repair or secure a boundary wall, and the walls and roofs of washhouses and closets at 3Court, Rea Street South, of which he is the owner, and which are deemed by the city surveyor to be in a ruinous and dangerous condition. Mr. Reay Nadin (from the town clerk's office) prosecuted, and stated the application was made under section 75 of the Town Improvement Clauses Act. The property defendant owned in Rea Street was very old. The boundary wall built upon defendant's land was in a very dilapidated condition. The bricks were absolutely rotten, while the mortar was falling out. A dangerous accident was liable to take place at any time. Two ranges of closets and also some washhouses in the centre of the court were in a similar condition. The ordinary notice to pull the dangerous buildings down or have them secured was served upon the defendant on June 27th, but he refused to comply with it. He (Mr. Nadin) wished the magistrates to make an order to compel the defendant to do the work at once. Mr. F. W. Rinder, the district building surveyor, and Mr. Henry Price, building surveyor, described the bad condition of the brickwork, and expressed the opinion that the only way to deal with the buildings was to have them pulled down. Defendant said it was not necessary to take the property down, and he called a labourer who said that he had been at work in repairing and securing the walls for five or six weeks. The magistrates made an order for the buildings to be pulled down within seven days, and the defendant had to pay the costs of the summons.

The Affairs of Mr. Alfred Gilbert, R.A.—On Thursday last the first meeting of creditors was held under the failure of Alfred Gilbert, R.A., the well-known sculptor. The debtor, who presented his own petition, states that he has been engaged in his profession for the past twenty-four years, the income from which from 1884 to 1894 amounted to £2,000 a year. In the latter year, upon the death of Sir Edgar Boehm, he was engaged by the executors to complete a quantity of his unfinished work, with the result that he neglected his own, and although remunerated did not make the income he had previously made. He was encouraged to undertake big statuary, which necessitated larger premises, and he started building his present studio, to complete which he borrowed £7,500 on mortgage of the premises. Being pressed by creditors about the middle of 1898 he borrowed £2,000, which he paid into a bank in the name of Mr. G. G. Lewis and another, and since that time they had practically controlled his finances. His income from 1898 to the present time had amounted to about £2,700, and he attributed his failure to undertaking larger statuary work which proved unremunerative. He states his debts at £7,000. The assets are stated to be mainly dependent upon the completion of commissions in hand. Proofs to the amount of £6,948 were put in, and resolutions were passed winding up the estate in bankruptcy, with Mr. Lawrence Hasluck, C.A., Holborn Viaduct, as trustee.

Bricks and Mortar.

APHORISM FOR THE WEEK.

An artist has more than two eyes.—SAM SLICK.

Our Plates. THE design for a private chapel by Mr. E. B. Lamb was prepared for a site situated in a very rustic and thickly wooded portion of a park. The aged and infirm villagers in a small agricultural hamlet close by would be permitted to worship here, their own parish church being some distance away, and the whole of the nave west of the transepts (thirty sittings) would therefore be regarded as free. It is cruciform in plan with octagonal transepts. The style is in keeping with the Hall, which was erected at the end of the last century, and the character of a village church has been adopted rather than that for the exclusive use of one family and servants. The seating would be of oak and the walls would be covered with oak panelling to the height of the seats. An oak screen of early Georgian design would be placed at the chancel arch and a handsome oak reredos beneath the East window. The tower is on the south side of the chancel, and would contain a peal of bells. An unusual effect is obtained inside by long angle principals crossing from the piers at angles of aisles outside, obviating the necessity of any piers at the junction of the nave and the chancel with the transepts. The picturesqueness of the cruciform plan inside thus remains, while an uninterrupted view of the whole of the church can be obtained from any part, which (though subject to many objections in a larger building) is of great advantage in a church of such small internal dimensions. The total seating is eighty-five. The view is taken from the south-west. The cost is estimated at £1,000, without the screen and panelling.—The Crown Hotel, Shrewsbury, situate close to the corner formed by the junction of Castle Street and St. Mary's Street, but just within the latter and immediately opposite the General Post Office, formerly a comparatively small establishment, having been acquired by the Church Stretton Hotel Co., has lately been practically rebuilt and greatly enlarged. The front of the hotel, facing the post-office and the side looking on the grand old church of St. Mary, has been entirely rebuilt in half-timbered style, to be in keeping with the old houses for which the town is famous. Over the plain walls and windows of the ground floors stand out the many-paned bay windows surmounted by curiously-carved gable ends. A feature of the front elevation is a monster wyvern, a "fearsome beastie," whose claws hold a shield bearing the name of the establishment, and from whose mouth is suspended a copy of an ancient horn lantern for the electric light. Opening off the entrance hall are a large reading- and writing-room, enquiry and booking office, with telephone, manager's room and a smoking-room bar, so constructed and arranged as to be cool in summer and most cosy in winter. To the right of this is a lofty dining-room 38ft. by 22ft., capable of accommodating 100 people at dinner. On the first floor in the main building are the commercials' dining- and reading-rooms. There are also in the hotel three large private sitting-rooms and over thirty bedrooms, in addition to the rooms reserved for the use of the staff. The electric light, with gas in case of any accident, is fitted in all the sitting- and bedrooms as in the public rooms. The bedrooms are so arranged and the lavatories, bathrooms, &c., are so placed that several suites of rooms can be separately let; and the set of rooms in the block looking towards St. Mary's Church can be quite shut off from the rest of the house. On the ground floor are two large stock and sale rooms, and the offices, kitchens, &c. The architect of the corner building was the late Mr. J. R. Withers, who also was responsible for a great part of the inside work, including the dining-room; whilst the post-office elevation was designed by Mr. Sidney Gingell Jones, of Shrewsbury. Mr. Bickerton, of Shrewsbury, built the corner structure, and Mr. E. H. Nicholas, of Coleham, Shrewsbury, carried out the alterations in the old part of the hotel and erected the new front facing the post-office. The decoration of the dining-room, ground floor, reading-room, hall and bar was the work of Messrs. Cole & Sons, Shrewsbury. The illustrations are from photographs by Mr. W. H. Gilbert, Wyle Cop, Shrewsbury.

The Spire of Yatton Church. THE peculiar shape of the truncated spire of Yatton Church came about in this way. It is said to have been built about the year 1455, and is mentioned occasionally in some of the early churchwardens' accounts. At that time it was, presumably, carried to a point, for when we come to the years 1595–96 the churchwardens' accounts reveal the fact that some portion of it was taken down. Between Michaelmas and Christmas, 1595, it was noticed that something was wrong, for three free masons were got to come and examine it, one of them by the name of Jeninge one of them "of Bristoe," and the other "out of ye forest." The first two of these are paid 2s. each, and the last 6s. while a labourer is employed "for ii dayes work about the steeple" at 1s. a day, and finally twelve pence is given "to the Free Mason in earnest for taking down the steeple." Soon after Easter, 1596, poles and lugges, and a rope which cost 13s. 8d., are bought, and men are employed to cut boughs and lay them on the church. A warrant is obtained from the bishop, and then there follows a number of payments to the plumber and glazier. The stones were apparently taken down and laid on the leads, for three men were employed to remove them from the leads, and another is employed to clean the leads. A feofment or rate of twopence an acre was then made, and brought in £14 6s. 8d., which was a large sum in those days, but there were some delinquents who, a year or so later, had not paid what was due from them. Then follow their numerous payments to the free mason whose name was Jones, but funds seem to have run short, and the wardens borrowed from the vicar, Mr. Clapham, in order to pay Jones. Towards the end of 1596, on February 17th (for the legal year then ended on March 24th), the churchwardens passed their accounts, but there is a note made that "Jones doth owe to the parish for coveringe the steeple vij*s* viii*d*," and apparently he did not complete his work, for between All Saints' Day and Christmas, 1597, there are purchases of "lyme, bordes, and nayles," and a payment of 6s. 8d. is made to John Marks "for covering the steple." The new churchwardens came into office on February 24th, 1597, and they paid a plumber from Bath for mending the leads throughout. This is the last payment in connection with the taking down of the steeple, but a memorandum is made of the persons who have not paid the rate towards it. These entries are sufficient to show that the spire was taken down to a certain point and then covered in, which leaves on one's mind the impression that it formerly rose to a point. Mr. John Harrison, who has investigated these old documents, has not been able yet to follow the history of the spire through all the years which have intervened since, but there is evidence that the battlements round the tower were repaired in 1824–5, when the bells were made a peal of eight; and that the weathercock was then erected on the spire either for the first time or after having been taken down for repair. At present the spire is being rebuilt, owing to its being in a very bad condition, but great care has been taken to preserve its shape, and to replace every sound stone exactly in the place from which it was taken.

The Caerwent Excavations. THE excavations at Caerwent are in full progress at the present moment; and although the houses uncovered during the past two years have been again covered up, the results of this season's work are such as to amply repay those who are interested in the history of Roman Britain for the trouble of making a pilgrimage to this ancient site. These results are, mainly, a house of unusual size in the south-west quarter of the city and the gate in the north city wall, which, as regards the extent of its preservation, is perhaps unique. The excavations will if possible continue till October, and will (if funds allow) be reopened early next year. The Fund has a very promising site of at least four acres secured for further excavations, but no means for providing for the expenses of labour are as yet furnished. Descriptions and plans of the previous work are now in the press, and will appear in the forthcoming volume of "Archæologia." The nearest station is Severn Tunnel Junction, and the postal address Caerwent, near Chepstow. Mr. A. T. Martin, hon. secretary, Clifton College, is now in residence superintending the work, and will be pleased to answer any communications on the subject.

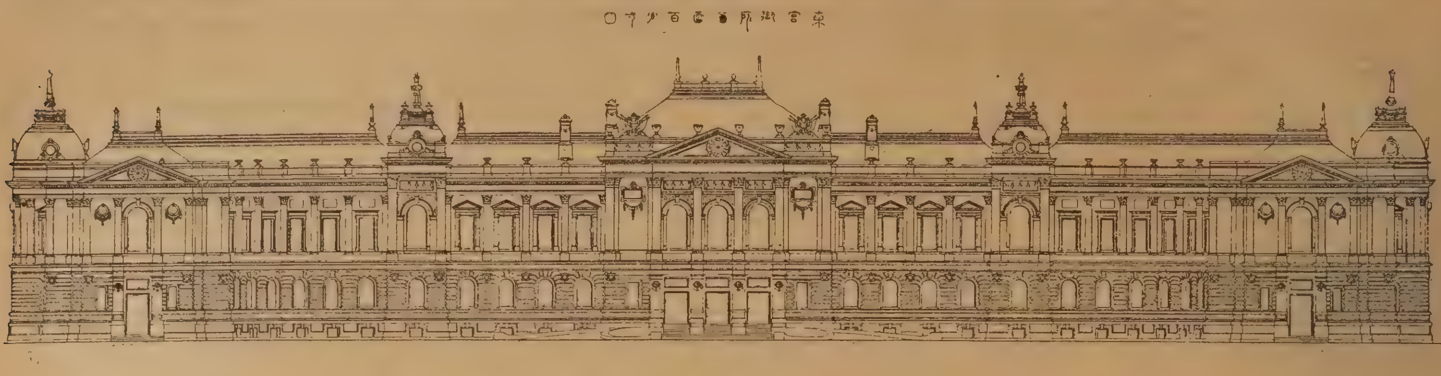
The New Gaiety and Mr. Norman Shaw. AT Spring Gardens is to be seen a small and carefully-built model of the first instalment of the Strand end of the new avenue—the western corner of the great crescent which will be occupied by the New Gaiety Theatre, the Gaiety Restaurant and Short's. In the designs for these new buildings a curious difficulty arose. The theatre at the corner, diving deep beneath the surface, had no aspirations towards loftiness, but the restaurant had towering ambitions, and so had Short's. Consequently the theatre, which will occupy the most conspicuous place at the corner, offered a stunted aspect beside its neighbours, and the general effect was well-nigh ruined. In this emergency Mr. Norman Shaw came modestly forward, being invited to make a suggestion. He ran a loggia round the summit of the theatre, passing through the domed tower at the corner. The suggestion, which simply and instantly gave unity to the general design, was enthusiastically welcomed, and the model at Spring Gardens promises at least one point of architectural dignity. When thanked by a leading member of the Improvements Committee who professed a desire to do something for London, Mr. Norman Shaw merely replied, "Do you think you are the only people who want to do something for London?"

Birmingham Artizans and the Crafts. THE artizans of Birmingham, working through the medium of their trades council, have organised a movement for providing bursary scholarships for the children of their class in the Birmingham University. In furtherance of this object a polytechnic exhibition was opened recently at Bingley Hall. Primarily the exhibition is designed to illustrate the variety and distinguishing characteristics of local manufacturing and commercial pursuits, and incidentally it presents a microcosm of the educational system by which invention, research, craftsmanship and artistic attributes are cultivated in the youth of Birmingham. The numerous objects of local manufacture make a very interesting collection, the attractiveness of which is enhanced both from the educational and from the mere sight-seeing standpoints by the demonstration of some of the processes. Many artisans contribute specimens of their own handiwork which serve to show the value of the work of those municipal and other agencies which are labouring to evoke and discipline the artistic instinct in conjunction with manual dexterity. There is a comprehensive exhibit setting forth the work of the students at the municipal technical school, and another from the municipal school of art. The West Bromwich Municipal School of Art also co-operates in exemplifying the work which is being done in giving a practical turn to the artistic resources of the district. The efforts of the artisans to make the exhibition successful have received the active support of the University authorities. Professor Lapworth has arranged a geological section and Professor Bridge is responsible for a natural history display. The Chancellor of the University, Mr. Chamberlain, has expressed his hearty approval of the object in view and his good wishes for the success of the scheme; while the principal, Dr. Oliver Lodge, has given active help to the promoters.

A Bradford Memorial to Queen Victoria.

MR. ALFRED DRURY, A.R.A., has prepared a model of the statue of Queen Victoria which is to be erected as a memorial of her late Majesty at Bradford. The statue will be placed in Victoria Square. As that space now stands the upper portion—a plot of ground which was formerly the graveyard of Horton Lane Chapel—is terraced, and a flight of steps, not at present available for the public, has been constructed to afford access from the garden below. These steps will now be removed and their site will be occupied by the large statue of the Queen. The statue will be of bronze, and will represent the Queen in her state robes as she appeared about 1887. Her Majesty holds in her hands the sceptre and globe, and wears a small imperial crown, and a widow's veil falls back over her ermine collar. The statue stands on a pedestal flanked by architectural works which are simple and dignified in design. Below the figure and raised only slightly above the level of the existing garden, upon a spacious stepped platform, will be a semicircular space, enclosed by low walls, and forming a small ornamental basin fed by fountains. The fountains will be wholly decorative in character, the intention being that the statue of the Queen, while it is the purpose of the whole work, shall also be the main artistic item in the composition. Any attempt at allegory or story-telling is therefore avoided. The principal fountain supplying the basin will, according to the present design, represent the head of Neptune, having on either side life-sized figures of children holding fishes. From the mouths of the fishes and of Neptune will spurt jets of water falling into a large scallop shell and overflowing into the basin. On either side of this central composition will be small drinking-fountains decorated with female heads and dolphins. These sculptural groups will, like the statue and the plinth on which it stands, be in bronze, and the architectural work will be of Yorkshire stone brought to a high finish. ¶ The whole work will be of heroic proportions. ¶ The Victoria Square, with the roads with which it is

CHARTRES CATHEDRAL: THE FLYING BUTTRESSES.



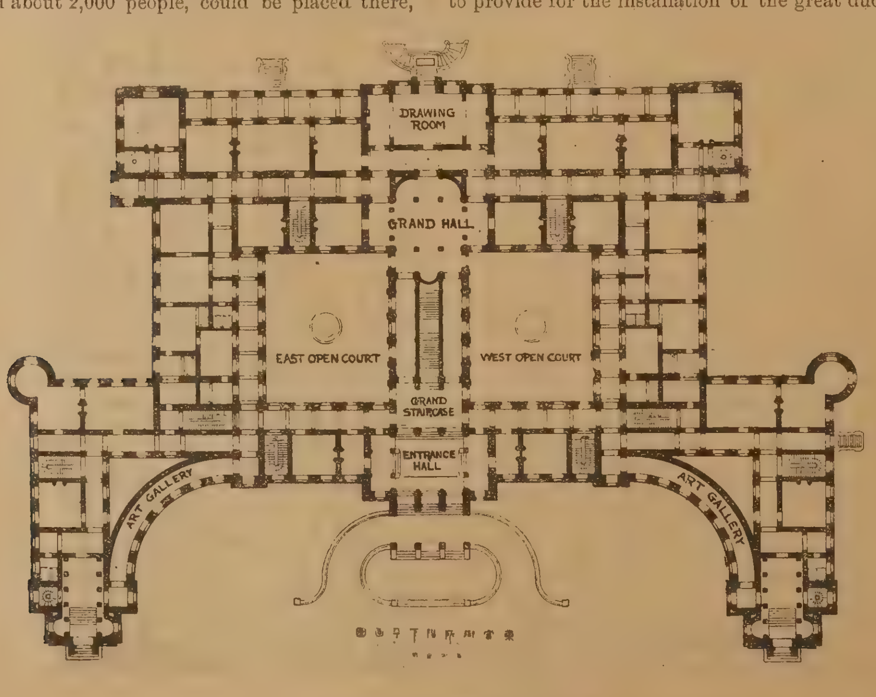
DESIGN FOR THE NEW IMPERIAL PALACE AT TOKIO, JAPAN. DR. TOKUMA KATAYMA, IMPERIAL ARCHITECT.

surrounded, occupies a considerable area, and any small composition would be dwarfed by the surroundings. Horton Lane Chapel is a large building which will necessarily from most points of view form the background of the memorial. The statue itself will be 9ft. 6in. in height, independently of the bronze plinth, which will add another 15in. The architectural work from the platform to the base of the plinth will be 11ft. in height, and the whole of the architectural composition will be some 36ft. from side to side. Upon the face of the architectural pedestal it is proposed to place three bronze tablets. Mr. Drury expects to have the statue and the sculptural works ready within about a year.

The Abbey and the Coronation. MR. SOMERS CLARKE thinks that the arrangements for the Coronation ceremony in Westminster Abbey should be of such a character as to avoid many objectionable features that have characterised its predecessors. He protests against the "monstrous blockade of galleries in every possible and impossible corner." In view of the fact, he says, that the ceremony is of a religious character; that it takes place in one of the most beautiful churches in the world; and that unless it be conducted with dignity it had better not be done at all; is it right to cram in, at the risk not only of their own lives but of the lives of the royal personages, twice as many people as the place will reasonably hold, merely that they may be spectators? Treated with decency and reverence, he continues, the place will accommodate perhaps 5,000, and the rest can be very adequately accommodated elsewhere. The remedy he proposes is the elaboration and enlargement of a structure which has on previous occasions been erected at the west front of the church. A large and stately hall, to hold about 2,000 people, could be placed there, wtih waiting-rooms attached, and as it would stand in the open, abundance of stairs could be arranged for the safety of spectators, whilst the structure itself could be composed of incombustible materials. In addition, he suggests that Dean's Yard, Poet's Corner, and St. Margaret's churchyard could be enclosed and covered in as assembling and waiting-places for the spectators.

A JAPANESE PALACE.

WE give on this page the front elevation and ground-floor plan of the new palace now being erected at Tokio, Japan, for His Imperial Highness the Crown Prince from designs by Dr. Katayma, imperial architect of Japan. This building, costing more than £600,000, will be one of the largest palaces in the world; and while being built primarily as a residence for the Crown Prince, it is also intended as a memorial to the reign of the present Emperor. It is, besides being thoroughly fireproof, also earthquake-proof; this being accomplished by the erection of very heavy walls tied and supported by a most elaborate system of steel construction. The greatest care has been taken in the planning of every detail to make the palace not only a work of art, but a luxurious semi-public building for the entertainment of Japanese royalty. The great banqueting hall is on one side of the building and the ball-room on the opposite side. The reception-rooms, apartments of His Imperial Highness and Her Imperial Highness, the smoking-room, and several suites throughout the building, will be equipped with the most modern hygienic and sanitary appliances, especially as regards the heating and ventilating plant by Messrs. Walker & Chambers, of New York. It required much study and skill to provide for the installation of the great ducts and pipes for the supply and discharge of air to and from the several rooms and not to interfere with the special "earthquake-proof feature." It has all been accomplished very ingeniously, and the plant itself is an elaborate one. The architect and his consulting engineers sought the best talent in America and Europe in connection with this important matter of heating and ventilating.



GROUND-FLOOR PLAN.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Architectural Handbooks.

H. R. writes: "Kindly recommend some good books on (1) styles of lettering for plans, &c.; (2) colouring perspective sketches, &c., and (3) a waistcoat-pocket architects' and surveyors' handbook."

(1) "Alphabets, Old and New," by Lewis F. Day (3s. 6d. nett). (2) "Hints on Architectural Draughtsmanship," by G. W. Tuxford Hallatt (1s. 6d.). (3) "Architectural Surveyor's Handbook of Formulæ, Tables and Memoranda," by J. T. Hurst (4s. nett). These can be obtained from Mr. B. T. Batsford, of 94, High Holborn.

Laying Wood-Block Floors.

GLASGOW.—R. R. writes: "Kindly give information about the materials required for laying wood-block floors; also the method of laying the blocks, and the names of firms who supply the composition."

In laying wood-block floors the area to be floored should be excavated to a depth of 6in. or 8in. below the intended floor-line, and then levelled and well rammed. Stakes should then be driven into the ground about 6ft. or 8ft. apart around the space, with their heads levelled to the required height of the concrete, which should be poured in, rammed, and struck off to the tops of the stakes. After allowing a few days to elapse, screeds of cement 3in. wide and 1in. thick should be run around about 6in. from the walls, carefully levelled and made straight with rules. The whole space should then be floated with Portland cement and struck off from the screeds to a level surface. When this is dry it should be swept clean, and (about 2ft. at a time) be well covered with boiling tar. Dantzic red deals, "flatted," make good blocks, so also do Gefle white battens; pitch-pine wears well but splits in drying. The blocks of wood should be ploughed all round, and loose tongues inserted when laying. The blocks, previously baked, should be dipped into a kettle of tar to a depth of half their thickness, and quickly rubbed into position, a few taps with a hammer being given to consolidate them. If the tar is thin a little pitch may be added to stiffen it. The work should be commenced at the farthest corner from and finished at the doorway. You should apply to the local sawmills for prices of wood blocks. There are several patent systems of wood-block flooring the manufacturers of which can be found in Laxton's or Lockwood's price-books, and most of these would also be willing to quote you for plain blocks.

Architectural Engineering.

Dumpy Level writes: "I have been articled for three years to an architect and surveyor, and am now an assistant in an architect's office, where, I believe, I am giving satisfaction. I have, however, no liking for the profession, at any rate not for its artistic side, as my tastes lie in the direction of engineering, both civil (so-called) and mechanical. I am nearly nineteen years of age, and, I think, an accurate and delicate draughsman (*sic*) and good land surveyor. I have received a good general education, and have a fairly wide, though in most cases cursory, knowledge of scientific subjects. My ambition is to become a civil engineer. What course would you advise me to follow, taking into consideration the fact that I could not well afford to accept a situation with a salary of less than one pound, or at the very least fifteen shillings, a week? Please also recommend me a practical book on builders' book-keeping, also a good book on specifications the price of which does not exceed 7s. or 8s."

"Dumpy Level"—an architect's assistant, aged nineteen years, with anti-artistic instincts, fostered by an ambition to be a civil engineer, and withal an accurate and delicate draughtsman, and a good land surveyor (does not he tell us so?)—is not modest. "Dumpy Level" must be more patient; he must wait awhile, for "practice makes perfect." We do not advise you to abandon all the knowledge which you have been acquiring during the last few years and to start afresh as a civil engineer. If, as you say, you have a liking for engineering, there is plenty of opportunity to satisfy your desire, for there is such a thing as architectural engineering (the designing of iron roofs, bridges, &c.), and you could thus profitably employ the knowledge you now possess (see the replies under the heading "Theoretical Mechanics" on page 122 of our issue for March 20th last; under "Architectural Training" on page 346 of our issue for June 5th; under "R.I.B.A. Examinations" on p. 477 of our issue for January 23rd, 1901, and under the heading of "Scientific Masonry" on p. 11 of ou rissue for August 14th. There is no *practical* book on builders' book-keeping. "Specification No. 4" (published at these offices, price 5s. nett) will exactly suit your needs.

Measuring Paintwork.

Warrington—H. & S. C. write: "What would be the proper measurement for cornice (one coat of paint) of 1ft. 9in. girth? We measure all below the underside of cornice into sq. or super. ft., but we consider treble measurement allowable for an enriched cornice."

We consider that it would be only a fair measurement to take the cornice treble, but a price per sq. yard is usually given for the room as a whole, measured by the length of walls and height from ceiling to floor, or the wall taken separately and the cornice at per ft. run.

The Temple at Eleusis.

Taunton—D. P. A. writes: "I should be glad of any information about the temple at Eleusis (general plan, &c.) from which Mr. Phené Spiers takes the Ionic Order given in his book on the Orders."

See page 93 of our issue for September 5th, 1900.

Land Surveying.

Ipswich.—Area writes: "I presume that in the table given in 'Practical Surveying' on Land Quantities, that 10 sq. chains equal one acre, Mr. G. W. Usill refers to Gunter's chain of 66ft. and not to the 100ft. chain which is sometimes used."

Gunter's chain of 66ft. is referred to.

Measuring Internal Plastered Work.

Nottingham.—F. W. writes: "Which is the correct way to measure the plastered work of a room 10ft. 5in. high with a cornice which works down the wall 6in. and a skirting 11in.? Should it be measured from the top of the skirting to the under side of the conice; also, should the ceiling be measured inside the cornice or between the walls? Should the fireplace openings be deducted?"

Measure between skirtings and ceiling, or, if rendered behind skirtings, measure all in from floor to ceiling. The correct way is to deduct from the ceiling the projection of cornice at one side and end, but this is generally neglected unless the cornice is unusually large, say, of 24in. girth. Cornices of not more than 12in. girth are taken by the foot run; if larger than this, by the foot super. If they do not exceed 12in. in girth the length of walls will be sufficiently exact for length of cornice; but when the girth is more take the mean length. Number all mitres, stopped ends, mitred and returned ends, stating girth of cornice, and circular corners, stating girth of corner and cornice. Plastering in small quantities is kept separate from the rest and measured by the super. foot instead of by the yard. No deductions are usually made for chimney openings, this being considered equal to making good, but if deducted add for making good.

Green Stain for Wood.

Sunderland.—Enquirer writes: "Some red pine was stained green and varnished two coats. The green colour is fading (the wood being near the window) and parts are turning yellowish-brown. What is the cause of this? I have some more woodwork to stain. What stain will be the best to use?"

You do not state the composition of your stain, but we presume an analine green was used. Analine colours will not stand, as exposure to the atmosphere causes them in time to fade and turn into a brown resin. It is difficult to recommend a green stain. We do not know of one good in colour that will last. A solution of verdigris or chrome green might be used. Then there are Brunswick green and green verditer, but these are more in the nature of paints. You could also turn the wood yellow by brushing with a solution of nitric acid, *i.e.*, aqua fortis, and then stain it blue, say, by using Prussian blue. See reply about "Green Stain" on page 388 of our issue for August 2nd, 1899.

Site for Houses.

Heywood.—Enquiry writes: "Which will be the best site on which to build two houses, as per enclosed sketch (not reproduced)? The site is almost the highest point in Heywood. You will see that the living-room will be the most important room."

The south side of the road is the most suitable; the living-room will then face the south and obtain plenty of sun, and the front room will face the road. The kitchen is in an awkward position in both houses, but the one with the kitchen window facing west is the better of the two.

Buildings in Lancashire and Cheshire.

Manchester.—J. H. writes: "I should be glad to know (1) whether the oak screen (date about 1640) in Cartmel Priory Church, North Lancs., is a suitable subject to measure for the R.I.B.A. Final Examination; and (2) I should also be glad of any suggestions of work to measure in Cheshire or the surrounding counties."

(1) Yes. (2) Illustrated articles on Lancaster and the neighbourhood appeared in our issues for August 11th and 18th, 1897. In Cheshire the following Elizabethan mansions are worthy of note: Bramall Hall, near Stockport; Brereton Hall, near Sandbach; Crewe Hall, the seat of Lord Crewe; and Eaton Hall, the seat of the Duke of Westminster. Then there are Chester Cathedral, the old half-timber houses of Chester, and Wrexham Parish Church. If you consult any good archæological record of the county, you will be able to select many more Early English Renaissance and Gothic buildings that are worth measuring.

The Monument to the late General Sir William Penn Symons, now in course of erection in the Victoria Gardens, Saltash, will be built of granite from the Merivale quarries, and will be surmounted by a carved crown heavily gilded. At the base will be empanelled a bronze medallion bust of the late general, designed and executed by Mr. Alfred Drury, A.R.A.

New Patents.

These patents are open to opposition until October 8th.

1900.—Instrument for Setting-out Curves.—11,666. H. Fischer, Ansbach, Bavaria. This instrument is to all intents a simple form of theodolite minus the ordinary telescope and fine-sighting adjustments. It is designed for approximate measurements of angles to be used for projecting curves, but it can also be used for approximate surveying, and has the advantage, where great accuracy is not required, of being inexpensive.

Plastic Decorations.—13,602. H. Schudt, 51, Savigny-Strasse, Frankfort-on-Maine, Germany. A dough-like mixture is used of (say) 70 per cent. of chalk, 10 per cent. of a mixture of glue, resin and varnish (say 4 per cent. glue, 3 per cent. resin and 3 per cent. varnish), and 20 per cent. of boiled linseed oil combined with colouring matter of the desired shade. This is applied in successive layers with a brush. For very sharp effects a filling material is employed, such as string or wire. The decoration remains uninjured by exposure. No moulds are used.

Sculpture-copying Apparatus.—13,640. F. Denny, 20, Corbyn Street, Hornsey Road, London, N. By this apparatus pieces of sculpture, carving, ornament, &c., can be copied, either enlarged, reduced or of the same size as the original; carving, for example, can be worked by the machine on the face of a building. The invention consists of two similar and opposite shafts with two similar and opposite pantographs, all movable on one pivot and controlling the opposite ends of a tracer-rod and cutter-rod. A contrivance is also provided for undercutting.

Concrete Piles.—15,932. G. L. Mouchel, 38, Victoria Street, Westminster, S.W. This invention relates to connecting two or more lengths of pile. Hitherto, if a concrete pile driven into the ground was to be lengthened, a timber mould was built up on the head for moulding the new length—an expensive work, and one involving loss of time, as the new length must set for about a month before driving can be recommenced. According to this invention the pile is moulded in separate lengths, each with a central socket and core-piece at the ends, an iron collar securing the whole. When the pile is driven home grout is forced into the space between the core-piece and the socket, and this completes the connection.

Wood-Paving Blocks.—17,448. J. A. Brodie City Engineer, Liverpool. To prevent the blocks being forced up, "dogs" are fixed between them. These "dogs" are metal stampings or castings having three spikes projecting at each side of a centre plate, which serves to separate the blocks for the pitching.

Fire-grates.—18,459. J. Alves, 50 and 51, Lime Street, London, E.C. The grate has an air-chamber at the back, or at each side, in direct communication with the ash-pan.

1901.—Sash Cords.—8,465. R. A. Ray, 94, Cleethorpe Road, Great Grimsby. The cords are made of six or more fine steel wires and one or two copper wires of a similar gauge, combined with a soft cotton, hempen or other cord. Such cords are claimed to be more durable and more pliable.

Lavatory Basin Frames.—9,141. G. D. Innes, Hyde Road, Ardwick, Manchester. The frame is made in three parts to suit basins of different sizes.

The following specifications were published on Saturday last, and are open to opposition until October 14th. A summary of the more important of them will be given next week.

1900.—14,091, Lovett, sanitary van. 14,278, Passow, process for producing first-class cement. 13,211, Thorp & Marsh, gas-pressure recording apparatus. 15,349, Dutton, guards for wood-cutting machines. 15,769, Holdsworth, Midgley & Holdsworth, vehicles (known as timber-wheels) to expedite unloading. 16,109, Smyth, apparatus for manufacturing acetylene gas. 16,572, Lewis, combined mallet and rule. 16,661, Leisering, varnish can. 17,315, Parkes & Appleby, latch and other locks. 17,593, Leach gulley traps. 17,726, Henry Brook & Co., Ltd.,

& Sykes, traps for street gulleys. 17,890, Sherwin, lavatory basin overflow passages. 17,907, Parker & Parker, sash-windows. 18,098, Robertson, cranes. 18,840, Watson, refuse destructors.

1901.—481, Drouillard & Scully, ventilating water-closets. 6,839, Nash, die for making bricks, tiles, pipes, &c. 11,068, Mörth, dust carts. 11,651, Long, guards for circular saws. 11,679, Delehanty, pipe connections chiefly designed for water-closets. 13,111, Heaton & Boice, machine for tonguing or grooving lumber. 13,776, Midgley, sash-fasteners. 13,817, Wuhrmann, wooden blocks or prisms applicable to mosaic slabs or boards.

Engineering Notes.

The Construction of the Keyham Harbour, Devonport, Extension has been secured by the Thames Ironworks against five other competitors. The amount of the contract price is said to exceed £400,000.

Elevators at Buckingham Palace.—The contract for the supply and erection of elevators at Buckingham Palace has been placed with the Otis Elevator Company, 4, Queen Victoria Street.

Change of Address.—The Pulsometer Engineering Co., Ltd., has removed its works and offices from Nine Elms, S.W., to Nine Elms Iron Works, Reading, Berks. The offices and showroom at 63, Queen Victoria Street, London, E.C., are still retained.

A New Bridge at Allanaquoich, Braemar, is proposed to be erected by the Aberdeen County Council. The design shows a road bridge about 95yds. higher up the stream, with concrete piers carrying steel girders covered with pitch-pine in a single span of 50ft., at an estimated cost, including diversion of road and formation of retaining walls, of £200.

Bursting of a Water Main.—In Finchley Road, Hampstead, last week, a water main belonging to the West Middlesex Waterworks Company, and situated immediately over the main-line tunnel of the Midland Railway, burst. The water main, which is one of three supplying a large district, is 15in. in diameter and about 2ft. below the surface of the roadway. The pressure of the released water caused the upheaval of the wood pavement to the height of 18in. across the roadway, and the heavy granite kerbstones of the footways were displaced and broken. The wood-paving blocks were displaced for a distance of over 300 yards, and the water spread across the road and paths, in some places reaching to the doors of the shops on both sides. The flow of water continued for half an hour, and a large volume penetrated to the tunnel below, through which runs the goods lines of the Midland Railway. The structure, however, was not damaged, and no suspension of the traffic was necessary. The vehicular traffic along the road had to be diverted, and cannot be resumed until the wood-paving has been relaid. The flow of water was stopped by the cutting off of the supply at the pumping station at Barrow Hill Road.

Steel Works in Japan.—The Imperial Selet Factory at Wakamatsu was founded in April, 1900, and commenced in February last the manufacture of pig iron, and in May the work of manufacturing (about 40 tons a day) Siemens' steel. Two of the five roll mill plants having been completed, the production of medium and small rails and plates was started towards the end of June. The other plant will be completed by the end of September, and the manufacture of large rails and other ware will be started at once. It is estimated that 90,000 to 100,000 tons of steel could be produced in a year, when all the arrangements shall have been completed, and the operations can be carried out to their full extent. Next year the factory will use iron obtained from Akiya in Echigo, where ore has been found, stated to be equal in quality to the best imported mineral.

A Fatal Crane Accident, which resulted in the death of three men and serious injury to a fourth, occurred at the North-Eastern Railway Company's Central Station Hotel, Newcastle-on-Tyne, last week. An addition is being made to the hotel, and there was a jib-crane in use for the construction of the building, consisting of an upright and a movable arm, the jib working in a socket and having a rise and fall of about 65ft. from the vertical to the horizontal position. Beneath this jib a small crowd of workmen, numbering about thirty-five, were engaged in mixing cement and in other occupations. The jib gave way owing to causes not yet ascertainable and fell amongst the men, killing three outright and very severely injuring another. The accident caused great excitement, occurring as it did in one of the busiest thoroughfares. The victims were so tightly held down by the jib that much difficulty was found in extricating the bodies. Had the jib fallen 15in. to the south-west, neither fatality nor injury would have been caused by the accident.

The New Harbour Works at Montevideo.—July 18th last was a great day for Montevideo, as on that day the foundation-stone was laid of the new harbour works which, it is hoped, will more or less restore the lost position of Montevideo as the principal port on the south-west coast of South America. The site selected for the inaugural ceremony was a large vacant esplanade at the extreme east point of the city, whence will spring the main breakwater of the new port on the eastern side, in a direct line with Calle Sarandi, the dividing street of the "old" city. The port works, though they require from six to eight years for their completion, will have a stimulating effect on commerce and industry, promoting a return of general prosperity and progress. The new port is being constructed by a French syndicate formed *ad hoc*, consisting of MM. Allard, Cirseau, Couvreux, Dollfus, Duparchy and Wiriot, names all well known in engineering and financial circles. The contract price is 9,916,336 dols. gold—say, £2,115,000—but the State has to provide dredging material to a sum not exceeding 4,900,000f. The plans for the works were drawn up by M. Guerard, of Marseilles, and Herr Kummer of Hamburg, on the basis of surveys made by Luther & Co.; and Herr Kummer has accepted the post of technical inspector of the works. The funds are provided by special import and export duties yielding about a million gold dollars per annum, on the guarantee of which port bonds will be issued and will be taken up by the contractors themselves at current rate.

Indian Irrigation.—In view of Lord George Hamilton's announcement that a Commission, to be presided over by Sir Colin Scott-Moncrieff, is being appointed to lay down rules for the interlacing, encouragement and control of irrigation works in India, the figures given in the annual review of irrigation issued at the end of last month in India are of interest. From them it appears that twenty-two of the large productive works realised a nett revenue amounting to 9·52 per cent. on the capital outlay, while thirteen others yielded only 0·79 per cent., reducing the average return to 7 per cent. The total area of the crops irrigated or protected exceeded 18½ millions of acres, being an increase of over three-quarters of a million during the year. The principal enhancements were in respect to the Punjab canals, the area irrigated there exceeding all previous records by over 300,000 acres, while the nett return on capital in respect to that province was as high as 10·24 per cent. Still more gratifying results may be looked for in the current year, since the great Jehlum Canal, begun in the autumn of 1898, is to be formally opened in October, and will irrigate a vast tract of country lying between the Chenab and Jehlum rivers, a great portion of which has hitherto lain waste. Other large projects are being carried out in the Punjab. The total surplus revenue earned since irrigation works were undertaken by Government has been nearly ten million sterling. This is the purely financial result of irrigation, regarded as an investment, and the figure quoted has no reference to its economic value in increasing food supplies, in preventing famine and in strengthening the position of the owners and occupiers of the land. Neither does it take into account the increase of land revenue received by the State as a result of bringing waste tracts under cultivation.

Keystones.

Mr. Hamo Thornycroft's Colossal Statute of Alfred the Great is to be unveiled at Winchester on September 20th.

The Devonian Club have elected Mr. C. H. Brodie, A.R.I.B.A., as the secretary in succession to Mr. George Wreford, C.C.

At the Union Infirmary, Great Dunmow, Essex, new bathrooms and iron staircase will be erected from the designs of Mr. Richard Creed, of 11, Finsbury Circus.

Mr. D. W. Stevenson, R.S.A., who has just been commissioned to execute a statue of Burns for Toronto, is one of two brothers who follow the profession of sculptor, W. G. being a painter also.

A New Organ is to be erected at the expense of the Chinese Government in the chapel at St. Augustine's College, Canterbury. The instrument is to be a memorial of the Rev. Sydney M. W. Brooks, formerly a student at St. Augustine's, who was killed in China last year.

In the Church of Stoke-Bruerne, Northants, a baptistery has been formed at the south-west end as a memorial to the late Mr. George Savage, a former churchwarden. The baptistery has been surrounded with wrought-iron railings of suitable design, and the font has been transferred there from its previous inconvenient position. Other improvements have been effected.

The New R.C. School at Wishaw, in Graham Street, has been erected to accommodate 500 scholars, and has cost £4,000. It has a frontage of 104ft. and a depth of 49ft. The lower flat contains four classrooms for the junior department, also masters' and mistress's retiring-rooms, closets and lavatories, children's cloakrooms and working-rooms. The stairs on either side lead to the upper departments.

A Monument to Nadejda Dourova is to be erected in Elabouga, Russia. The father of this remarkable woman was a captain of cavalry, and at the age of twenty-three she enlisted in a Lancer regiment as a man and was known as Sokolov. Later her sex was discovered, and she was recalled to St. Petersburg, but the Emperor, hearing the circumstances and seeing her, authorised the Amazon to remain in the army in a regiment of Hussars under the name of Alexandrov. As an officer she distinguished herself in the campaign against Napoleon in 1812, being wounded at Borodino, and received the Cross of St. George.

Archæology in Greece.—It has been decided that invitations to a Congress of Archæologists, to be held at Athens in April, 1903, shall be issued by a committee, composed of the Minister of Public Instruction and the directors of the French and German Archæological Institutes, with the Crown Prince as honorary president. The subjects of discussion will be notified beforehand. Five meetings will be held at Athens, and ten other meetings during excursions to Olympus, Delphi and other places of antiquarian interest. The invitations will be addressed to all Governments, academies and universities in the world. It is estimated that about five hundred delegates will attend the congress.

In St. Day Church a new altar and choir stalls have been placed at a cost of £150. The improvements in the chancel consist of the substitution of masonry steps and floor, in place of the wooden structure that existed formerly. These steps, three in number, have granite risers, whilst the treads and floor are paved with dark-red encaustic tiles of mosaic pattern. On the floor a daïs formed of granite kerb and tile pavement supports the new altar, which is a beautiful specimen of ecclesiastical carving. It is of oak and is a replica of that in the recently restored church at Kea, excepting some slight modifications in measurement, rendered necesary from the fact that this stands in a semicircular apse. The front of the altar is divided into five spaces for panels, the upper and lower parts of which are filled with tracing of intricate design. The painting of these panels is the work of a member of the choir, Mr. Harry Brock. The new choir stalls, also of oak, are of Gothic design.

For a new Grammar School at Holt, Norfolk, the designs of Mr. Chatfeild Clarke have been accepted by the Fishmongers' Company.

Mr. G. D. Martin is the architect of the new buildings about to be placed on the site recently occupied by the Roman Catholic Church, Moorfields.

Cottage Homes are to be erected by the Bermondsey Guardians for the poor children of Bermondsey, at a cost of £148,000.

The Guildhall Art Exhibition.—The exhibition of works of Spanish artists which has been on view at the Guildhall since May 1st closed last Wednesday with a total attendance of 305,000 persons. The attendance was higher than at any previous picture exhibition held under the auspices of the City Corporation.

Mr. Charles Abbey, a well-known architectural sculptor, passed away at his residence at Rosemont Road, Richmond Hill, on August 21st, in his sixty-sixth year. He was widely and deservedly respected in his profession. For some years he was partner in Dublin with Mr. Charles W. Harrison, now senior member of the firm of Messrs. Harrison & Sons, monumental statuaries, of Great Brunswick Street, Dublin.

Pocklington Church is undergoing a long-needed restoration. The architect is Mr. John Bilson, F.S.A., of Hull, whose name will be a sufficient guarantee that the work will be carefully and well done. The condition of the fabric is very bad. The roof of the nave might at any time have fallen in, and if this had happened during service it would have repeated that sad and fatal disaster which occurred at St. Mary's, Beverley, on the third Sunday after Easter, 1520. The pews are worm-eaten and rotten, and cannot be put back.

A Protest against a Board School Site.—Poplar is protesting against the London School Board's proposal to spend some £66,000 in building a school on a most unsuitable site—some waste land by the dismal Lea at Bromley-by-Bow, close to the stables of the London General Omnibus Company. At a recent meeting of the Poplar Borough Council the site was described as a rubbish shoot. It is also unsuitable in situation and in other respects. Yet the School Board have given nearly £6,000 for the site and propose to pay £60,000 for a school on it.

A New Public Hall at Kingswells, Aberdeen, is being erected by the side of the public road, nearly opposite Kingswells United Free Church, the west side of the building facing the road leading to Fairley and Cloghill. It is to be a plain structure, estimated to cost nearly £1,000. In the basement provision is made for cooking, and there is other accommodation which will be used as a storeroom. On the ground level, entered from the public road, there will be a large hall capable of accommodating from 450 to 500 people and a small hall to contain about 100 persons. Considerable progress has been already made with the work, the walls being almost completed and joists for the flooring being laid. The contractors are: Mason, Mr. David Main, Aberdeen; joiner, Mr. Alexander Hall, Mile End, Aberdeen; slater and plumber, Mr. S. Christie, jun., Dyce; and painter and glazier, Mr. G. Bowman, Inverurie.

New Offices for the Tottenham and Edmonton Gas Light and Coke Co. have been built recently from plans prepared by Mr. John S. Corder, of Wimborne House, Ipswich. The style is a free treatment of German Renaissance. The structure rests on a rough granite base 4ft. high, and above this the construction is of red bricks, relieved by red Ballochmyle stone, yellow Mansfield stone and Gunton's terra-cotta. The roof is of Broseley tiles, whilst the flats at the back are concrete and asphalt. Special difficulties arose in connection with the building from the fact that the Moselle Brook runs completely under the foundations, and great precautions had to be taken to ensure the safety of such a heavy structure coming in such close proximity to it. The building has two important street-frontages, and the principal front is relieved by a large projecting porch surmounted by a carved pedimented gable, and a smaller gable of similar design is placed between the porch and the angle of the building. At the corner a large octagonal oriel is constructed, springing from a stone corbel. The clerk of the works has been Mr. Harry Cockrell.

Municipal Turkish Baths are to be erected by the Camberwell Borough Council in the Old Kent Road. The cost is estimated at £3,000.

A New Organ in St. John the Baptist Church, New Springs, has been erected at a cost of about £700. It has been built by Messrs. Peter Conacher & Co., of Huddersfield.

St. John's Church, Gainsborough, is to be enlarged by lengthening the nave by three bays at an estimated cost of £2,500 to £3,000. It will provide seats for 240 more people, the present accommodation being for 450.

Alterations in the Fortifications of Langres have brought to light a gate built in the year 301. It is a splendid specimen of Gallo-Roman art, somewhat similar in style to the Roman gates at Reims and Autun, and consists of two arcades (Reims has three) and five Corinthian pilasters.

A New Roman Catholic Church is being erected at Downall Green, Liverpool, in memory of the late Mr. John Mercer, J.P., of Alston Hall, near Preston, founder of the Park Lane Collieries, who left £6,000 towards the erection of the church. The building, with a presbytery, will cost about £10,000.

Anne Boleyn's Castle—also known as Green Street House—East Ham, which is to be converted into a Roman Catholic mission, is a large red-brick mansion, supposed to occupy the site of a seat of the Nevill family. Its most conspicuous feature is a tall tower surmounted by a cross, and here tradition asserts that Anne Boleyn was imprisoned before being taken to Greenwich and thence to the Tower. Another story is that Anne was betrothed to a young nobleman who died, and during the period of mourning Henry VIII. built the tower for her amusement.

St. Paul's and Wren's Prophecy.—In view of the recent discussion regarding the stability of St. Paul's Cathedral, the following passage from an article in the "Lady's Magazine" for August, 1798, headed "Anecdotes of Sir Christopher Wren," is of interest: "This great master of architectural composition always said that if the dome of St. Paul's settled it would settle towards the south. This has taken place as Sir Christopher predicted in consequence of their not allowing him stone as he desired, instead of rubble, to sill up the piers, which are bound round at the bottom with an iron chain let down into melted lead."

The International Exhibition at Wolverhampton will be held next year. Lord Barnard has granted part of the site, and an area of over thirty acres is made up of a portion of the park, including a lake belonging to the town. Mr. H. A. Hedley, the general manager of the Glasgow Exhibition, and Messrs. Walker & Ramsey, the architects of part of the buildings of that undertaking, are now engaged in maturing the plans of the halls in which the exhibition is to be held. Intending exhibitors are reminded that applications must be received not later than October 1st next, at Gresham Chambers, Wolverhampton.

A New Wesleyan Chapel at Idmiston is being erected on a site adjacent to the main road. The building, which is estimated to cost £560 in addition to the £40 for the site, will be 44ft. by 24ft., and will accommodate 135 persons. There will be a small vestry at the rear, and space will be left for eventually building Sunday schools. The building will be of red brick with stone dressings, with an open-timber hammer-beamed roof covered with slates. The style is Gothic of the Early English period. Messrs. Gordon & Gunton, of Blomfield Street, E.C., are the architects; and the builder is Mr. E. Witt, of Salisbury.

A New Public Hall at Bewdley is being erected in the rear of the George Hotel in Load Street. It will be a commodious building, the main room measuring 74ft. by 27ft. and, with the gallery, capable of seating about 500 persons. The entrance is large, and on each side of the doorway are cloakrooms. The roof is open-timbered, and will be stained and varnished, and stained-glass will be inserted in the windows. The platform will be a movable one, and the ante-room large and well arranged. The building will be heated by hot-water pipes and lighted with gas. Messrs. Nicholls & Co., Ltd., of Worcester, are the builders, and Mr. Cross, of Walsall, the architect.

QUERIES ANSWERED

RESPECTING

Our Insurance Schemes.

From time to time we have queries addressed to us by readers on points affecting our Accident Insurance Schemes. The greater number of the queries relate to the conditions of payment, and to enlighten those who may still be in doubt we think it desirable to state

(1.) That it is not necessary to subscribe direct to the office in order to secure the benefits.

(2.) That even if ordered through a newsagent the subscription need not be prepaid for a year. It is sufficient to order it and pay as may be arranged with the newsagent.

(3.) It is sufficient to have an intimation from the newsagent that he supplies copies regularly.

(4.) That policies can be issued either direct to the subscriber or through the newsagent, whichever may be preferred.

(5.) In applying it is not necessary to write a long letter—a postcard will do, giving the full name and address of the newsagent from whom the copy is obtained.

There are **Three Schemes** of Insurance connected with our Papers, guaranteed by the Ocean Accident and Guarantee Corporation, Ltd.

Scheme No. 1 is a free Accident Insurance of **£500.**
FREE.

(*Every regular reader of the Builders' Journal is entitled to this without any payment.*)

Scheme No. 2 is an Accident Insurance of **£500,** giving the following additional advantages:

Premium, 1/-

£250 for Permanent Total Disablement.

£2 10s. 0d. per week for Temporary Total Disablement.

Scheme No. 3 is an Accident Insurance of **£1,000,** with these additional advantages:

Ordinary Risks, Premium, £3/-/-

Hazardous Risks, Premium, £3/10/-

£500 for Permanent Total Disablement.

£6 per week for Temporary Total Disablement.

£1 10s. per week for Temporary Partial Disablement.

£30 Annuity.

£3 per week during confinement from such illnesses as Diabetes, Scarlet Fever, Carbuncle, &c., &c.

If these schemes interest you, write for full particulars to

THE MANAGER OF THE
BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Sept.	6	Barking, Essex—Iron Building	Urban District Council	C. F. Dawson, Public Offices, Barking.
"	6	Bristol—Alterations	—	A. P. J. Cotterell, 28 Baldwin Street, Bristol.
"	6	Dewsbury—Conveniences, &c.	—	Holdom & Fox, Architects, Corporation Street, Dewsbury.
"	6	Great Yarmouth—House	—	S. Rivett, 5 Southquay, Great Yarmouth.
"	6	Old Penshaw, Durham—Houses	Mr. R. W. Wilson	R. W. Wilson, Westbourne House, Shiney Row.
"	6	Cardiff—Materials	Guardians	A. J. Harris, Queen's Chambers, Cardiff.
"	6	Ponkey, near Ruabon, Wales—Organ Chamber	—	Dover House, Chapel Street, Ponkey.
"	7	Preston—Alterations	—	F. E. Dixon, 49 Lune Street, Preston.
"	7	Great Harwood, Lancs—Schools	—	Rev. W. C. Rank, 141 Blackburn Road, Great Harwood.
"	7	Aber, Wales—Additions	—	A. O. Evans, Pontypridd.
"	7	Comber—Six Kitchen Houses	—	W. H. Wheeler, Architect and Surveyor, Castle Street, Comber.
"	7	Banbridge, Ireland—Schoolhouse, &c.	Select Vestry of Seapatrick Parish	T. Larmour, Dromore Street, Banbridge.
"	7	Edinburgh—Washhouses	Corporation	Public Works Office, City Chambers, Edinburgh.
"	7	Rugby—Public Slaughterhouses, &c.	District Council	D. G. Macdonald, Surveyor to the Council, Rugby.
"	9	London, E.—Bricks	Stepney Borough Council	Mr. W. Jamieson, 15 Great Alie Street, Whitechapel, E.
"	9	War Department Contracts (Aldershot)—Repairs and Materials.	—	Sub-District Commanding Engineer, South Aldershot, R.E. Office.
"	9	Aberdare—Swimming Baths	Urban District Council	Surveyor, Town Hall, Aberdare.
"	9	Cwmavon, Wales—Vestries	—	G. E. Prosser, Cwmavon.
"	9	Griffithstown, near Pontypool—	Panteg Urban District Council	Surveyor's Office, Sunny Bank, Griffithstown.
"	9	Manchester—Walls, &c.	Corporation	City Surveyor, Town Hall, Manchester.
"	9	St. Albans—Lavatory Buildings	Herts County Council	County Surveyor's Office, 41 Parliament Street, Westminster, S.W.
"	9	Southborough, Kent—Chapel, &c.	Urban District Council	W. Harmer, 137 London Road, Southborough.
"	9	Sedgefield—Stores and Office Block	Visiting Committee of Durham Asylum	W. Crozier, County Surveyor, Shire Hall, Durham.
"	9	Braintree—Alterations, &c., at Workhouse	Union Guardians	F. Smoothy, Clerk, New Street, Braintree.
"	10	Wimbledon—Floor	Urban District Council	R. J. Thomson, 47 Hill Road, Wimbledon.
"	10	Ulverston—Bridge Improvements	Main Roads and Bridges Committee	County Bridgemaster's Office, Preston.
"	10	Oxcliffe Marsh, Lancs—Arch	Main Roads and Bridges Committee	County Bridgemaster's Office, Preston.
"	10	Lincoln—Abattoirs	Markets Committee	R. A. Macbrair, City Surveyor, Corporation Offices, Lincoln.
"	10	Kidwelly, Ireland—Coastguard Station	—	A. Ferguson, Insurance Buildings, Donegal Square West, Belfast.
"	10	Bristol—Stable	Great Western Railway Company	Engineer's Office, Bristol Station.
"	10	Wolverton—Caretaker's House	Parish Council	S. Jones, 100 Cambridge Street, Wolverton.
"	10	Northrepps, near Cromer—Classrooms	School Board	J. T. Willis, 25 Cabbell Road, Cromer.
"	11	Hackney—Works at the Brentwood Schools	Guardians	W. A. Finch, 76 Finsbury Pavement, E.C.
"	12	Andover—Bridge	Rural District Council	J. Wormald, The South Cottage, Andover.
"	12	Brighton—Artizans' Dwellings	Town Council	F. J. C. May, Town Hall, Brighton.
"	12	Langho, near Blackburn—Homes	Lancs Inebriate Acts Board	H. Littler, County Architect, County Offices, Preston.
"	12	London, S.E.—Cottage and Shed	Lewisham Borough Council	Surveyor, Town Hall, Catford.
"	13	Llanedy, Carmarthen—School	School Board	J. Davies & Son, Cowell House, Llanelly.
"	14	Flookburgh, Lancs—Rebuilding	Miss Seath	Field Head Farm, Flookburgh.
"	14	Patterdale, Westmoreland—Police Station	—	J. Bintley, 7 Lowther Street, Kendal.
"	16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
"	16	Mansfield—Schools	School Board	Vallance & Westwick, Mansfield.
"	16	Birmingham—Cottages, &c.	Guardians	Whitwell & Sons, 23 Temple Row, Birmingham.
		ENGINEERING:		
Sept.	7	Tralee, co. Kerry—Rebuilding Bridge	County Surveyor	S. Goodwin, County Surveyor, Tralee, co. Kerry.
"	7	Southend-on-Sea—Electric Lighting Cables	Corporation	D. F. Adamson, Corporation Electricity Works, Southend-on-Sea.
"	7	Usworth, Durham—Lamps, &c.	Parish Council	J. R. Elliott, Fern House, New Washington, co. Durham.
"	9	Penmaenmawr, Wales—Sea Wall	Urban District Council	E. Worrall, Engineer, Council Offices, Penmaenmawr.
"	9	Rawmarsh, Yorks—Repairs to Mains, &c.	Urban District Council	Surveyor, Council Offices, Rawmarsh.
"	9	Swinton, Lancs—Bacteria Filters	Urban District Council	H. Entwisle, Surveyor to the Council, Council Offices, Swinton.
"	9	Swansea—Road Roller	Corporation	Borough Surveyor, Swansea.
"	9	Edinburgh—Electric Light Installation	—	Resident Electrical Engineer, Electricity Supply Station, Dewar Place, Edinburgh.
"	9	Lowestoft—Electric Lighting Plant	Mayor and Corporation	R. B. Nicholson, 115 High Street, Lowestoft.
"	9	Cowes, Isle of Wight—Pumping Machinery	Urban District Council	J. W. Webster, Engineer to the Council, Cowes, I.W.
"	9	Beaminster, Dorset—Adit	Rural District Council	H. Gordon, 9 Downes Street, Bridport, Dorset.
"	10	Oldham—Electric Cranes	Corporation Electricity Committee	A. Andrew, Gas and Water Offices, Oldham.
"	10	Rawtenstall, Lancs—Rebuilding Bridge	Main Roads and Bridges Committee	County Bridgemaster's Office, Preston.
"	10	Briton Ferry and Quaker's Yard, Glamorgan—Reconstructing Bridges.	Great Western Railway Co.	Engineer, Neath Station.
"	11	Godstone, Surrey—Sewerage, &c., Works	Rural District Council	T. C. Barralet, Surveyor to the Council, New Oxted.
"	13	Kirkcaldy, Scotland—Overhead Construction for Electric Tramways.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
"	13	Torquay—Arc Lamp Carbons	Electric Lighting Committee	P. Storey, Borough Electrical Engineer, Electricity Works, Torquay.
"	14	Shrewsbury—Heating	—	Churchwardens, Abbey Church, Shrewsbury.
"	14	Warrington—Electric Lighting, &c.	Corporation	J. Deas, Engineer, Bank House, Warrington.
"	14	Dundee—Overhead Equipment	Town Council	W. J. Tittensor, City Electrical Engr., Dudhope Cres. Rd., Dundee.
"	14	Batley—Permanent Way	Corporation	Lacey, Clirehurst & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
"	14	Llandudno—Waterworks	Urban District Council	E. P. Stephenson, Engineer & Surveyor to the Council, Llandudno.
		IRON AND STEEL:		
Sept.	6	Valetta, Malta—Pipes, &c.	—	Superintendent of Public Works in Malta.
"	9	Aberdare—Railings	Urban District Council	Surveyor, Town Hall, Aberdare.
"	10	Barking, Essex—Wrought-iron Railings	Urban District Council	C. F. Dawson, Public Offices, Barking.
"	11	Gosport—Railing	Urban District Council	H. Frost, Surveyor, Town Hall, Gosport.
"	11	Downpatrick—Ironmongery, &c.	District Lunatic Asylum	S. Rea, Clerk, Downpatrick.
"	11	London, E.C.—Ironmongery	Guardians of the Holborn Union	J. A. Battersbury, Clerk, Clerkenwell Road, E.C.
"	14	Glasgow—Pipes	Corporation	J. M. Gale, 45 John Street, Glasgow.
"	17	Bournemouth—Steel Rails, &c.	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
"	18	Netherlands—Asphalted Cast Iron Pipes, Railway Carriages, &c.	Ministry for the Colonies	Commercial Department, Foreign Office, S.W.
"	20	London, W.C.—Rails, &c.	British Electric Traction Co., Ltd.	Chief Engineer of the Co., Donington House, Norfolk St., Lon., W.C.
		PAINTING AND PLUMBING:		
Sept.	7	Hunwick—Painting Primitive Methodist Chapel	—	T. Craddock, Hunwick, Willington.
"	9	Jarrow—Repairing, &c. Lamps	Urban Sanitary Authority	Borough Surveyor's Office, Grange Road, Jarrow.
"	11	Cannock, Staffs—Painting, &c.	Guardians	A. W. Carver, Clerk, Union Offices, Cannock.
		ROADS AND CARTAGE:		
Sept.	6	Shrewsbury—Steam Roller, &c.	Atcham Rural District Council	J. Everest, St. John's Hill, Shrewsbury.
"	9	Epping, Essex—Carting	Urban District Council	G. J. Creed, Epping, Essex.
"	9	Romford—Granite Spalls	Guardians of Union	W. Smith, 24 North Street, Romford.
"	9	London, E.—Vans	Stepney Borough Council	M. W. Jamieson, 15 Great Alie Street, Whitechapel, E.
"	9	Nottingham—Forming, &c.	Guardians	A. Marshall, Architect, King Street, Nottingham.
"	9	Ryton-on-Tyne—Cartage	Urban District Council	J. P. Dalton, Surveyor, Ryton-on-Tyne.
"	9	Sunderland—Road, &c.	Corporation	Borough Engineer's Office, Town Hall, Sunderland.
"	9	Swinton, Lancs—Street Works	Urban District Council	H. Entwisle, Surveyor of the Council, Council Offices, Swinton.
"	9	Waterhead, Oldham—Paving and Flagging	Lancs County Council	J. Slater, 2 The Polygon, Eccles, near Manchester.
"	9	Brentwood, Essex—Roads	—	E. Millard, Surveyor, 1 Finsbury Circus, E.C.
"	10	Barking, Essex—Street Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
"	10	Blackwell—Making-up Streets	Rural District Council	H. Silcock, 31b West Gate, Mansfield.
"	10	Christchurch, Hants—Quartzite	—	E. J. Legg, Borough Surveyor, Town Hall, Christchurch.
"	10	Cork—Ballast, &c.	Harbour Commissioners	J. Price, Commissioners' Engineer, Cork.
"	11	Todmorden—Street Works	Highways Committee	C. R. Pease, Borough Engineer & Surveyor, Town Hall, Todmorden.
"	14	Chelmsford—Street Works	Urban District Council	H. G. Warne, Avenue Chambers, Market Road, Chelmsford.
"	14	Cockermouth—Widening	Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
"	17	Amble—Making-up	Urban District Council	Council's Offices, 31 Queen Street, Amble.
"	17	Croydon—Roads Repairs	Town Council	Borough Road Surveyor's Offices, Town Hall, Croydon.
"	18	Newcastle-on-Tyne—Wood-Paving	North-Eastern Railways Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		SANITARY;		
Sept.	9	Eastwood, Notts—Scavenging	Urban District Council	F. R. Hawley, 1 Stamford Street, Ilkeston.
,,	9	Lytham, Lancs—Sewers, &c.	Urban District Council	A. J. Price, Engineer, Lytham.
,,	12	Weymouth—Extension of Outfall Sewer	Corporation	W. B. Morgan, Borough Engineer and Surveyor, Municipal Offices, East Street, Weymouth.
,,	12	Lewisham—Concrete Sewers	Council	Surveyor's Office, Town Hall, Catford.
,,	14	Maldon, Essex—Sewers, &c.	Rural District Council	H. G. Keywood, Public Hall Chambers, Maldon.
,,	20	Failsworth, Lancs—Removal of Night Soil	Urban District Council	Inspector of Nuisances, Council Offices, Failsworth.
Oct.	8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
		TIMBER:		
Sept.	9	London, E.—Timber	Stepney Borough Council	M. W. Jamieson, 15 Great Alie Street, Whitechapel, E.
,,	30	London, E.C.—Telegraph Poles, &c.	——	C. E. Stuart, Controller of Stores, General Post Office, E.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept.	16	Blackpool—Laying-out Land	£30, £15 and £5	Borough Surveyor, Town Hall, Blackpool.
Oct.	1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
,,	29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
,,	31	Derby—Tramway Offices, Waiting-rooms and Conveniences &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov.	15	London, N.W.—New Offices in Euston Road	£100, £75 and £50.	S. R. J. Smith, 14 York Buildings, Adelphi, London, W.C.

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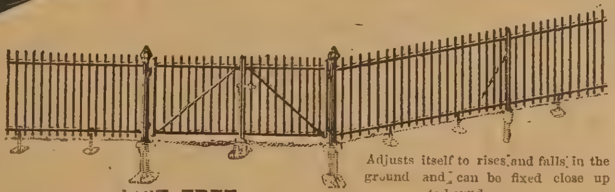

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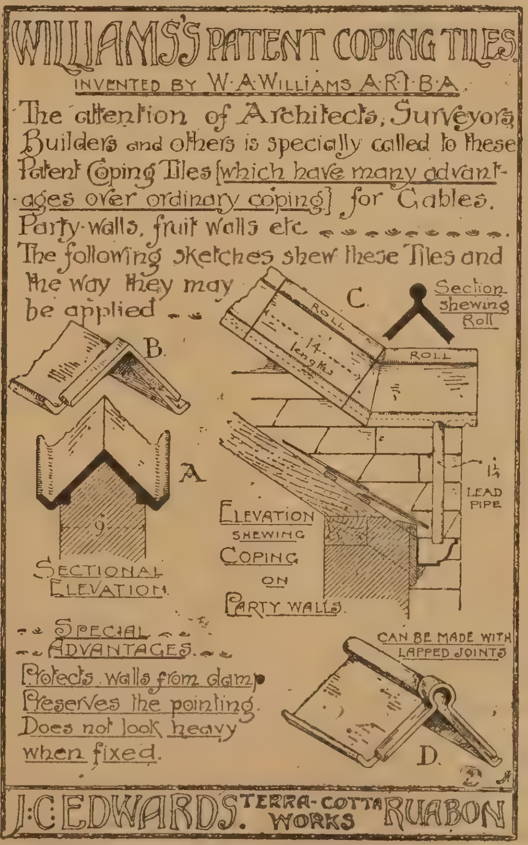
For GABLES, PARTY WALLS, &c.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INVENTED BY W·A·WILLIAMS A·R·I·B·A.
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The following sketches shew these Tiles and the way they may be applied
A.
B.
C.
D.
ROLL
ROLL
14 lengths
Section shewing Roll
1¼ LEAD PIPE
9
SECTIONAL ELEVATION.
ELEVATION SHEWING COPING ON PARTY WALLS.
SPECIAL ADVANTAGES.
Protects walls from damp.
Preserves the pointing.
Does not look heavy when fixed.
CAN BE MADE WITH LAPPED JOINTS
J. C. EDWARDS. TERRA-COTTA WORKS RUABON

This Coping prevents the water collected by it from running down and soaking into the wall beneath.

The end tile is provided with outlets, from which the water can be conducted to the eaves gutter or elsewhere by a small lead pipe, or the outlet holes can be omitted, the tile throated and set to let the water shoot clear of the building, but the pipe is recommended and the expense is trifling.

It can be used as well on the flat, as raking, for with a little care it can always be laid to a slight fall, the outlets then should not be more than 10 feet apart.

The Tiles are set and jointed in cement, the edges being scratched up rough to form a key, making a permanent and water-tight joint.

It will be seen that with these Copings the walls are protected from dampness, pointing preserved, rooms in roof kept dry, and defective flashings and fillets do not cause so much leakage. No other ordinary Coping answers the same purpose.

COMING EVENTS.

Wednesday, September 4.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. E. J. Steegmann, M.B., on "Natural Forces: Light, Heat, Electricity, Chemistry," 7 p.m.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow (Second day).

Thursday, September 5.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow (Third day).

Friday, September 6.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. E. J. Steegmann, M.B., on "The Atmosphere: Pressure and Composition, Air, Combustion and Respiration," 7 p.m.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow (Fourth and last day).

Saturday, September 7.

ARCHITECTURAL ASSOCIATION.—Sixth Summer Visit to Wakehurst Place, Ardingley, Sussex (a fine specimen of a large Elizabethan Manor House).

Monday, September 9.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Marriott, on "Meteorology," 7 p.m.

Wednesday, September 11.

SANITARY INSTITUTE.—Council Meeting at 5 p.m. (Lectures and Demonstrations for Sanitary Officers: Part I.)—Mr. J. Priestley, B.A., M.D., on "Sanitary Law," 7 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Meetings of Examination and Literary Committee at 3 p.m., of General Purposes and Finance Committee at 4 p.m., and opening Sessional Meeting at 7 p.m.

BRITISH ASSOCIATION.—Annual Meeting at Glasgow (8 days).

Friday, September 13.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, B.A., M.D., on "Sanitary Law," 7 p.m.

Monday, September 16.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, B.A., M.D., on "Sanitary Law," 7 p.m.

Wednesday, September 18.

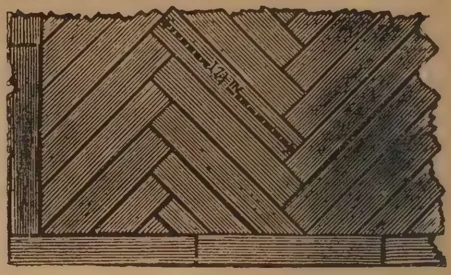
SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, B.A., M.D., on "Duties of a Sanitary Inspector—Outdoor," 7 p.m.

Saturday, September 21.

INSTITUTE OF SANITARY ENGINEERS.—Examination qualifying for admission to Institute (Second day).

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Sunderland.

FLOORING BLOCKS.



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	At Wharf.	ex Ship within one month.	At Wharf.
17¼ × 3 × 3	13 8	12 9	17 6
17¼ × 3 × 2	8 11	8 2	12 6
17¼ × 3 × 1½	6 10	6 3	9 6

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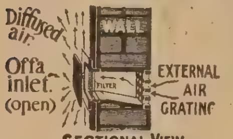
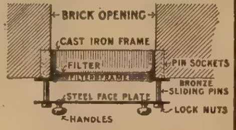


SECTIONAL VIEW.



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	s.	d.
BUILDING ACTS:		
1855, 18 & 19 Vict. cap. 122	1	7
1894 (London), 57 & 58 Vict. cap. 213...	7	3
1898 (London), 61 & 62 Vict. cap. 137...	–	3½
DRAINAGE ACT:		
1847, 10 & 11 Vict. cap. 38	–	5
ELECTRIC LIGHTING ACTS:		
1882, 45 & 46 Vict. cap. 56	–	9½
1888, 51 & 52 Vict. cap. 12	–	1
EMPLOYERS AND WORKMEN ACT:		
1875, 38 & 39 Vict. cap. 90	–	5
EMPLOYERS' LIABILITY ACT:		
1880, 43 & 44 Vict. cap. 42	–	3½
FACTORIES AND WORKSHOPS ACTS:		
1878, 41 & 42 Vict. cap. 16	2	6
1883, 46 & 47 Vict. cap. 53	–	5
1891, 54 & 55 Vict. cap. 75	–	3
1895, 58 & 59 Vict. cap. 37	–	4½
PUBLIC HEALTH (Buildings in Streets) ACT		
1888, 51 & 52 Vict. cap. 52	–	1
WORKMEN'S COMPENSATION ACTS:		
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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

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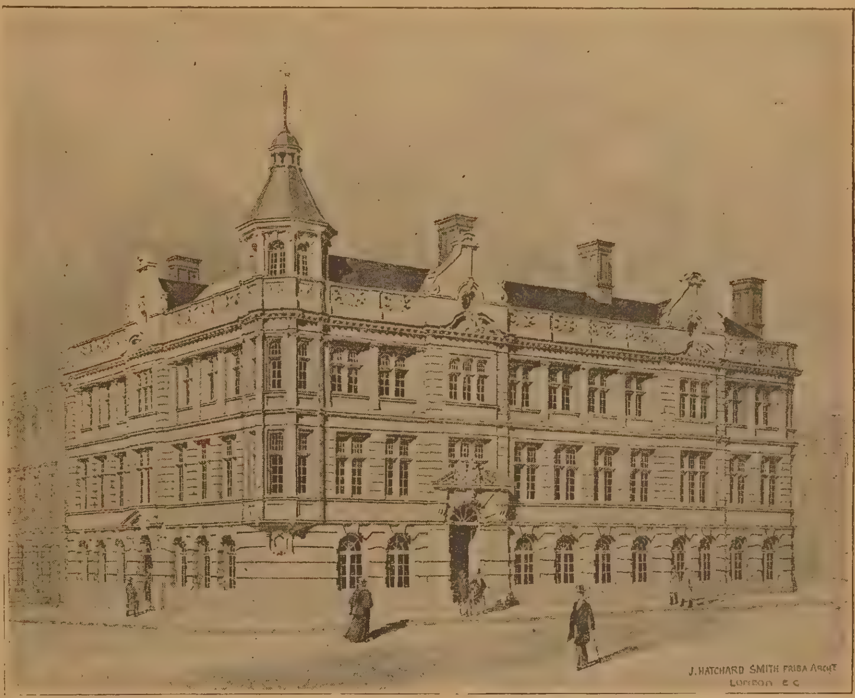
An Architectural Causerie.

The Noble Art of Self-Defence. SINCE it was announced that the new public offices in Whitehall were to be carried out by the Government officials, the First Commissioner of Works and his Department have been the objects of such lively criticism that they evidently thought it was high time to publicly defend themselves; hence the article reprinted on page 66. Because the Record Office in Chancery Lane is—from an official point of view—one of the most beautiful buildings in London, and because the General Post Office North and the Admiralty are—from an official point of view—almost without a flaw, it does not necessarily follow that they are equally satisfactory to those who are not of the official genus; and be it remembered that no man buildeth for himself. As regards the suggestion of employing an outside architect of standing to complete the work, this was abandoned because he would be too individualistic and too busy, so that "a man in the second or third rank of his profession" would have had to be chosen. Yet on the authority of Mr. Leonard Stokes, one of the late Mr. Brydon's executors, we know that the drawings handed over to the Office of Works were but "incomplete drawings for the carcase of the building." Somebody will need to prepare the details, and we do not see that they will be less individualistic when done by Sir John Taylor and Mr. Henry Tanner than if the work were in the hands of one of those eminent outside architects who are "deeply committed to their own ideas of art": and individualism is of many kinds. In conclusion we would draw attention to the fact that, while Mr. Akers-Douglas distinctly stated that he hoped to effect "a considerable saving," the inspired writer of the article in question informs us that "financially it is highly improbable that any saving will be effected," which information we leave our readers to cogitate when pondering over the treatment of official architecture in this country.

The Earliest of Art. THE subject of art is so complex that it is not surprising to find no general conviction concerning its origin and its practice. "Art and Nature," says one writer, "are the two most comprehensive genera of which the human mind has formed the conception." This is the broad statement; as a transcendental one John Stuart Mill says that Art is as much Nature as anything else; that everything which is artificial is natural; and that Art has no independent powers of its own, being but the employment of the powers of Nature for an end. Other opinions, as diverse as they are unconvincing, could be cited, but it will suffice for the present to note the most recent which has attracted attention—that of Mr. Yrjö Hirn, who holds the opinion that Art is the outcome of "the natural tendency of every feeling-state to manifest itself externally, the effect of such manifestation being to heighten the pleasure and relieve the pain." From the foregoing it will doubtless be appreciated that the subject, considered from a fundamental standpoint, is likely to lead to innumerable opinions which, however ingenious, make us none the wiser. These several remarks, however, have some bearing on what follows. The study of the rise or development of art (architecture being a part) furnishes much more satisfactory results than an abstruse enquiry into its origin, for there are at least some tangible visible proofs. Vitruvius tells us that primitive man began to imitate the nests of birds and lairs of beasts, and constructed arbours with twigs of trees, after which came walls of dried turf strengthened with reeds and branches, the further progress from huts to houses being easy and gradual. This was most strikingly illustrated by Professor Flinders Petrie in his lecture on the sources and growth of Egyptian architecture (see our issue for May 22nd last). It is generally admitted that the cave, the hut or tent, and the house are the correct sequence in which man provided himself a shelter. With such a prologue we may now refer to a letter by Mr. Auberon Herbert which appeared in the "Times" last week. It is headed "A New Record of Totemism," a title which in these days might be calculated to assure its not being read by one in a thousand: and yet it is of much interest. Professor Petrie in the lecture to which we have referred astonished his hearers by speaking of the art that flourished in Egypt nearly eight thousand years ago. Mr. Herbert's letter carries us back at least eighty thousand years. That was the end of the Glacial period, which, according to Geikie, had lasted 160,000 years. It was then and thereabouts that the Old-stone-cutters or Palæolithic men thrived, men who had "real artistic power" and who traced the outlines of animals on fragments of deer's horn or pieces of schist with a strong clear touch. After them came the New-stone-men, who showed greater advance in the arts of life, making pottery and ornamenting it. Now the gist of Mr. Herbert's letter is this—the great bed of gravel which extends between the mouth of the Avon and Milford (near Lymington) practically consists of *worked* flints, a mass of *worked* stones. Some, he says, may be holy stones, or cup stones, or simply cut for the purposes of decoration. Amazingly delicate work is found on some of them. One appears to represent a pyramid, another a snake, another a fish, another a mountain peak, or a flame, or a beast or bird, or a "low-domed roof with ridges, hollow in the inside": but it is easy to conjure up fanciful resemblances, and the only safe guide is the repetition of the same type. Mr. Herbert says the workers must have been impressionists (how history repeats itself !). They caught some special feature and neglected the other features. They were not constrained by any sense of exactness. If they put in an eye on one side of what may be meant for a bird's head they might put in the other eye somewhere on the other side—it did not matter where; or perhaps they put both eyes in together on the same side, as a child does in drawing a profile, from the conscientious feeling that what is there ought somehow to be expressed. We will not go into further detail, but from what has already been said it will be seen that these early efforts towards Art are of considerable interest. Mr. Herbert hopes other persons will examine gravel beds. The floor of a gravel pit, a heap of gravel by the roadside, the margin of the road itself where the wheels do not pass, a friend's gravel path if not rolled down, or in some cases the bed of a stream or an estuary, will give a fair insight into the matter. The more specimens the more light will be thrown on the subject.

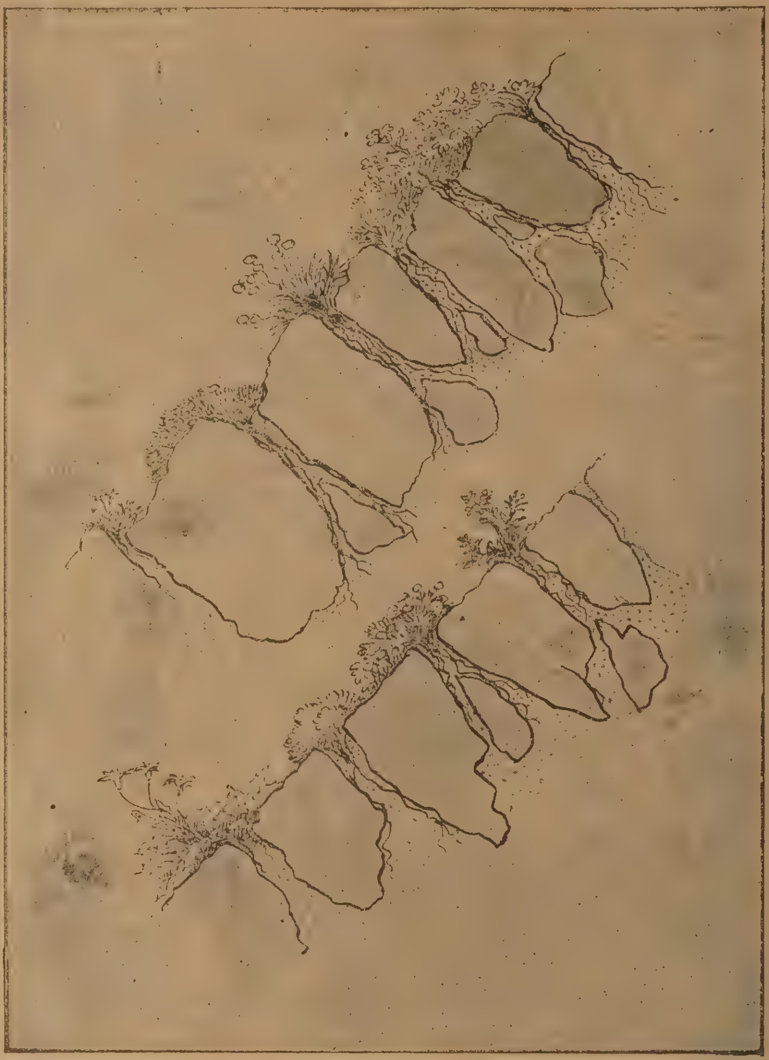

J. HATCHARD SMITH FRIBA ARCHT
LONDON E C

STATION STREET BUILDINGS, HUDDERSFIELD; FOR MESSRS. ARMITAGE & NORTON.

Station Street Buildings, Huddersfield. THESE buildings, illustrated on this page, are now being erected in a prominent position in Huddersfield. The elevations are faced with York stone, and all floors will be fireproof. Messrs. Abbey & Hanson, surveyors, of Huddersfield, prepared the working drawings and generally superintended the work. The buildings are being erected by Mr. M. Brook, of Huddersfield, from the design of Mr. J. Hatchard Smith, F.R.I.B.A., of 41, Moorgate Station Buildings, who periodically visits the work in progress.

GARDENS.

AN interesting and useful book on "Wall and Water Gardens," by Miss Gertrude Jekyll, has recently been published by Messrs. George Newnes, Ltd., of 7–12, Southampton Street, Covent Garden, W.C. (price 12s. 6d. nett); and while reviewing the book it seems opportune to make some remarks upon gardens in general and their design. Miss Jekyll has written much upon the subject of gardening, and in this latest work she has produced a most valuable contribution to garden literature. She writes pleasantly and clearly, with evident keen enthusiasm, and although she takes care to only lay claim to write for amateurs, as one of their number, we feel that she is more to be depended upon than the majority of gardeners or landscape-architects. In fact, we could not recommend a better guide for the beginner to follow, her taste being almost invariably correct. However, even here it is advisable for the student to have some method and general principles to work upon in order that Miss Jekyll's knowledge may be used to the best advantage in the quickest way, by getting to the pith of the matter and avoiding those bypaths in gardening which are to be found in the book. Miss Jekyll's plea that the walls of gardens and places where no hygienic considerations obtain should be constructed in rough dry-walling is a timely one. Most retaining and boundary walls built nowadays are only too uselessly barren. How interesting and beautiful they can become when the careful hand of Nature has placed plants in the crevices can be seen in any old building and in the boundary walls of country lanes. These rough walls, built of stone without mortar, offer a most satisfactory method of treatment in the construction of terraces on a hillside garden. In almost every locality stone can be easily obtained which will be suitable for this kind of walling, though not perhaps for building dwellings, &c.; or, if stone is unobtainable, chalk can be used.



SECTIONAL DIAGRAM SHOWING ALTERNATIVE ARRANGEMENT OF THE FACE OF THE STONES IN A ROCK-WALL AT AN ANGLE OF 45 DEGS.

A GARDEN TANK WITH FLAT KERB.

We may quote Miss Jekyll upon the treatment of garden terracing. "It is well in sharply-sloping ground to keep the paths as nearly level as may be, whether they are in straight lines or whether they curve in following the natural contour of the ground. Many more beautiful garden-pictures may be made by variety in planting even quite straightly terraced spaces than at first appears possible, and the frequent flights of steps, always beautiful if easy and well proportioned, will be of the greatest value. When steps are built in this kind of rough terracing the almost invariable fault is that they are made too steep and too narrow in the tread. It is a good rule to make the steps so easy that one can run up and down them, whether of skilled workmanship (as in the illustration on p. 65 of this issue) or rough. There is no reason or excuse for the steep, ugly, and even dangerous steps one so often sees. Unless the paths come too close together on the upper and lower terraces, space for the more easy gradient can be cut away above, and the steps can also be carried out free below; the ground cut through above being supported by dry-walling at the sides of the steps, and where the steps stand up clear below, their sides built up free. If for any reason this is difficult or inexpedient, a landing can be built out and the steps carried down sideways instead of up and down the face of the hill. In fact, there is no end to the pretty and interesting ways of using such walling and such groups of steps." These steps and walling in time become a garden of delightful small things. "I doubt if there is any way in which a good quantity of plants and of bushes of moderate size can be so well seen and enjoyed as in one of these roughly-terraced gardens, for one sees them up and down and in all sorts of ways, and one has a chance of seeing many lovely flowers clear against the sky, and of perhaps catching some sweetly-scented tiny thing like *Dianthus fragrans* at exactly nose-height and eye-level, and so of enjoying its tender beauty and powerful fragrance in a way that had never before been found possible." The disfiguring steep banks of mown grass generally seen on sloping ground are abominations compared with these delightful wall gardens; they are also troublesome to mow, and waste spaces that might be made of interest. In the author's words: "Not only does the wall afford the shelter needed for plants that would otherwise be scarcely hardy, but the effect of planting them with the roots spread horizontally, and the crown of the plant therefore more or less upright instead of flat, obviates the danger that besets so many tender plants, of an accumulation of wet settling in the crown, then freezing and causing the plant to decay."

A FINE HOUSE WITH UNBROKEN LAWN SPACE AND QUIET WATER-EDGE.

In constructing a dry wall it is best to set the stones more or less in courses or in lines of stratification, as we find them in a stone quarry or on any uncovered mountain side. The courses can run level or dip to right or left as they generally do in nature, but the same order must be kept throughout. "It matters not the least whether the courses are far apart or near together," says Miss Jekyll; "this is naturally settled by the steepness of the ground. In a wall they are necessarily close, and in very steep ground it is convenient to build them with the courses rather near each other. In such a case as a steep slope with an angle of 45 degrees, the face of the rock-bank could be built in either of the two ways shown in the diagram (see opposite page). Both will suit the plants. The flatter the angle of the ground the further apart may be the rocky courses, as the danger of the earth washing away is diminished. . . . But whether a stone lies level or not as to the right and left of its front face, it should always be laid so that its back end tips down into the ground, and its front face, when seen in profile, looks a little upward. This, it will be seen, carries the rain into the ground instead of shooting it off as it would do if it were laid the other way, like the tile or slate on a building." In fact, the whole face of the wall should lean back so as not to lose a drop of rain. Any loose earth at the back must be closely rammed to prevent the danger of the wall being burst outward under heavy rain. Whenever any newly-moved earth behind the wall is noticed it should be at once rammed and made firm in the same way. The spaces left at some of the joints and between the course are for planting, which is best done as the wall goes up, when the roots can be laid well out and larger plants used than if they were to be put in the wall when up.

A most useful suggestion is that the steps which go with the walling need not be entirely paved with stones; if the front edge is carefully fitted and fixed the rest can be levelled up with earth and the sides and angles planted with small growths. Miss Jekyll is somewhat too fond, however, of planting small growths in steps, and we would advise that these should be left to take care of themselves, for artificial planting can be easily overdone and soon becomes noticeable on steps which are generally associated with orderliness, a necessity to their usefulness; if they are overgrown they show that little use is made of them, and no planting can so fittingly suggest this idea as Nature's. Miss Jekyll has no doubt been biased in this by her enthusiasm for living growths, for she even commends such an atrocious anomaly as the flight of steps illustrated on p. 64, and goes so far as to say: "But the presence of such plants gives a keen delight to the flower lover, even though his sympathies with architecture may tell him that for plants to be in such a place is technically wrong." It may be, however, that the author is out of sympathy with this particular design, as she well might be; it is too cold and hard for country domestic work, its Georgian austerity being too stiff and unbending, with a Classic inutility which has no adequate excuse. The concealment of architectural features by climbing growths is also another thing in which the gardener generally errs, and we notice several cases where Miss Jekyll is caught tripping in this respect; this is doubtless caused by the nausea and animosity created in the mind of the Nature-lover by the great amount of bad architectural design to be seen everywhere around us, and a really suitable and fine piece of work is seldom so badly treated as the inferior examples are. This, however, is but another instance of the fact that only an architect is capable of judging architectural values.

It is to be hoped that the public will come to recognise in the near future that shams and makeshifts are not really cheap, and will realise that the logical course is to have that which will last, and not that which is most easily obtained in an inflated market. As an example, we may refer to that cheap and useful abomination, wire-netting. Before this came to desecrate the face of the earth, walls were built where something more permanent than a wooden fence was required, and these remain as a lasting source of delight to all cultured persons. Broken by piers of masonry, with wrought-iron gates of good design, they seem the only appropriate enclosure.

We would now make a few remarks on the ethics of garden treatment in general. Whenever man interferes with Nature he launches himself on a troublous sea—then he finds himself but a puny individual and must use her correctly in her own way, or inevitably fail. Art which deals with inanimate objects has perhaps greater knowledge of the medium in which it expresses itself, but on the other hand the Art which uses animate objects has immense aids, for it need have no concern with constructive work on its materials, having only to use or phrase them on a large scale, all the details being filled in by the finer hand of Nature, transforming crudities into beauties which are harmonic and absolute. This harmony of Nature arises from many causes. The wind sweeping across some open space or through the forest dominantly and irresistably plys the vegetation into one great chord; the particular soil of the locality impresses on the growth; the climate gives another distinctive quality; the neighbouring shelter gives another—in fact, the environment harmonises everything. What man, we would ask, can expect to take adequate cognisance of these actions and use them? To build for utility is the only safety. No one could design with fore-knowledge of the appearance of the old Kentish castellated house illustrated on p. 66. One seems to feel it as part of the wind-blown open-land, the waving flags and water-lilies in the moat and the hardy clinging ivy on its walls all adding to the effect. To show man's cleverness here would be a desecration. We may also refer to the old bridge illustrated which has so fallen into the landscape that to remove it would create an immense void. Such an association of course only comes in course of time.

Locality should influence a garden much, and a harsh note is at once struck when a foreign element is introduced, such as by the introduction of plants that do not belong to the general soil, or by the artificialities of the usual landscape-gardener with his rustic rocky pools, with sunk tubs, &c. Native plants should find more place, for they are the most natural. Modern gardening seems too much in the nature of an exhibition of samples.

One of the best characteristics of Miss Jekyll's book is the reason she advances for everything she does or advises, such as in the soils that suit certain kinds of plants, &c., and she seems to feel throughout what is the natural method of treatment in every case, and writes agreeably on such subjects as stream gardens, lakes, large and small ponds, pools and tanks; but she should not have recommended the making of imitation rock gardens where they form no part of a formal scheme. It is somewhat a pity that she did not place the remarks upon formal gardens more to the front of the book, for it is here that legitimate garden design really lies. The treatment of these is based on showing human contrivance throughout, and by this very fact they seem homely and human, although we agree with the author that the large gardens of grandiloquent design are cold and do not give that contentment to be found in a lovingly-cared-for garden. As she says, large gardens are "only redeemed when some master-mind, accepting the conditions of the place as they are, decides on treating it in some bold way, either in one grand scheme of colour-harmony or as an exposition of this principle combined with the display of magnificent foliage-masses, or by some other such means as may raise it above the usual dull dead-level." The following should be taken to heart—it is a subject we have said much upon of late: "I always suppose that these great wide dull gardens, sprawling over much too large a space, are merely an outgrowth of plan-drawing. The designer sitting over his sheet of paper has it within such easy view on the small scale, and though he lays out the ground in correct proportion with the block-plan of the house, and is therefore right on paper, yet no human eye can ever see it from that point of view; and as for its use in promoting any kind of happiness, it can only be classed among others of those comfortless considerations that perplex and worry the mind with the feeling that they are too much and yet not enough."

The architect should, by rights, design both garden and house, for the two must correlate most intimately; yet the majority of the profession have either ignored the subject or lacked opportunity so that their judgment could not be relied upon, for the utmost refinement and feeling is required in every detail. An instance, not so bad as ordinarily, of the usual non-conformity is to be seen in the garden tank and house illustrated on p. 62. Here the simple old house seems to require a more simple balustrade than that in front of it, and the tank is too classic or austere with its curved ends. What is wanted is a simple square rough-walled tank, as utilitarian and neat as the house. This tank, however, is commendable in other respects, the broad flat kerb of wrought stone being in harmony both with the level lines of the water and the flat expanse of grass. The author says in this connection: "The proper relation of the water-level to the edge of the tank is a matter that is often overlooked. It should not be far from the level of the lower inside line of the kerb. Nothing, except an empty tank or fountain basin, has a much more unsatisfactory appearance than a deep tank with only a little water at the bottom. They are often built quite needlessly deep. . . . . Many people will no doubt put forward an objection to the unprotected edge on account of danger to children. But even a flat-edged tank need not and should not be dangerous. In the first place, there is no need for any tank to be more than two feet deep, while its under-water margin need not be more than one foot deep. It is much better that this should be in two distinct steps, the outer and shallower part being two, three, or more feet wide according to the size of pool. This would also help to keep the water-plants in their place, as in a dressed tank it looks better that whatever is grown in it should be kept away from the edge, and be surrounded by a distinct margin of water." A striking instance of how plants can be used architecturally is afforded by an illustration in the book, in the emphasis and breaking of the monotony of a long line of balustrade caused by growths partly veiling its continuity.

There is a useful chapter entitled "When to let well alone" which might be elaborated with advantage. Reference is here made to the illustration of the noble house in South Middle England (see p. 63): "The picture is complete. The great building is reflected in the still water, and the natural water margin without artificial planting, is wisely left alone. It is all so solemn, so dignified, that any added fussiness of small detail, however beautiful in itself, would be a kind of desecration."

The book is copiously illustrated with admirably reproduced photographs, and these very materially aid the letterpress. The book contains a list of flowers, &c., and much other matter to which we have not space to allude. It should be bought by every garden-planner and every garden-lover.

LLANFAIRFECHAN PUBLIC HALL.

A NEW public hall at Llanfairfechan has just been erected. The building contains on the ground floor two shops, between them being the main entrance to the hall, which is 89ft. extreme length and 50ft. wide inside. At the end is a stage, behind which is a passage communicating with two suites of retiring-rooms. At the side is another entrance door, which provides an approach to the first floor, which contains a room intended for use as a council chamber and three other offices. The masonry, slating and plastering were undertaken and carried out by Mr. Erasmus Jones, Llanfairfechan; the joinery, glazing and painting by Messrs. R. & J. Williams, Upper Bangor; the heating and fire-extinguishing apparatus by Messrs. G. N. Haden & Sons, Birmingham; the ventilating by Messrs. J. Gibbs & Son, Liverpool; the lighting by Messrs. Vaughan & Brown, of London; the drop curtain by Messrs. J. T. Bull & Son, of London. Mr. Richard Davies, of Bangor, was the architect. The outlay on the building is £3,500, but the land and furniture will cost another £1,500.

NORTHAMPTON INSTITUTE CLASSES.

WE have received a copy of the "Announcements" for the session 1901–2 at the Northampton Institute, St. John's Street Road, Clerkenwell, E.C., which is one of the branches of the City Polytechnic. The excellent work done by this institution is too well known to need description. Its classes are multitudinous, and we shall now only speak of those which come within the scope of this journal. Mr. John Ashford, M.I.M.E., is the head of the mechanical engineering and metal trades department, being assisted by Mr. Hugh Davies, F.G.S., A.M.I.M.E., and Mr. J. M. Lester, A.M.I.M.E.; while Mr. John Williams is the head of the artistic crafts department. Among the classes conducted by them are those dealing with graphics, building materials, workshop drawing, building calculations, construction, design and decoration, architectural drawing, and structural engineering. Mr. R. Griffith is the instructor in carpentry and joinery, Mr. W. Firth in practical plumbing, Mr. E. L. Bates in practical brick-cutting, Mr. T. J. White in practical plastering, Mr. C. L. Hartwell in modelling, Mr. H. E. Warren in woodcarving and Mr. A. J. Ireland in painting and decorating. A special course of six lectures, commencing on September 25th, will be given for bricklayers, brick-cutters, stonemasons, &c. (fee 1s.); a special course of seven lectures, commencing on November 6th, for woodworkers (fee 1s. 6d.); a special course of six lectures on sanitation, commencing on January 8th next, for plumbers, sanitary inspectors and others (fee 1s. 6d.); a special course of three lectures on ironwork in buildings, commencing on February 19th next (fee 1s.); a special course of three lectures on plasterers' work, commencing on March 12th next (fee 1s.); and a special course of five lectures on modern building practice, commencing April 9th next (fee 1s.). Special classes will also be held in design for decorative and ornamental ironwork, woodcarving, woodworking, painting and decorating, architectural ornament for builders, modelling for stone and wood carvers, and ornamental modelling for plasterers. The winter term begins on Monday, September 30th. Full particulars can be obtained by applying to Mr. R. Mullineux Walmsley, D.Sc., Principal of the Institute.

CAMPANULA PYRAMIDALIS, ETC., IN THE JOINTS OF STONE STEPS.

SOLOMON'S "SEALED FOUNTAIN."

To be used for supplying Jerusalem with Water.

MANY people will be interested to learn from the correspondent of the "Times" that at last an actual beginning has been made to bring a supply of living water into Jerusalem. The remains of ancient aqueducts and reservoirs testify to the abundant provision which the Holy City had when it flourished as the metropolis of the Jewish State. But it has now long been dependent on the scanty and often polluted accumulations of rainwater from the terraces of different houses gathered in the rock-hewn cistern beneath them. There is already not only a dearth of water for household purposes, but the extensive building operations which form a chief source of employment to the artisans and labourers have had to be suspended, which has deprived thousands of employment.

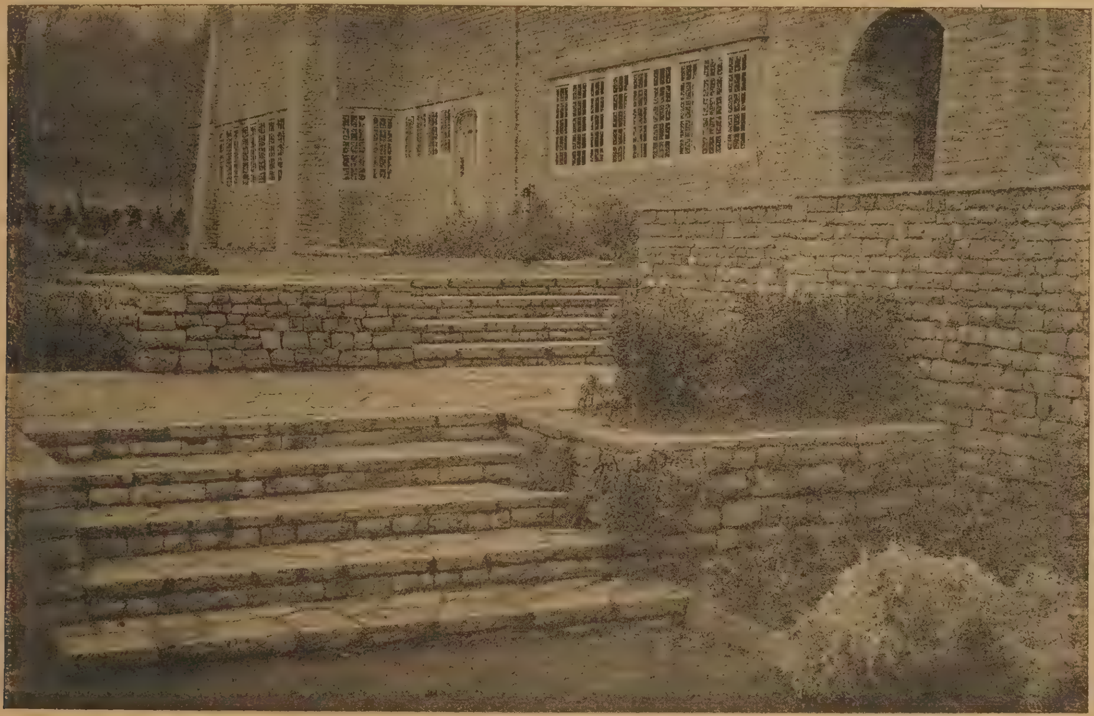
The work just begun is that of laying a pipe of 10c. diameter from the Sealed Fountain at Solomon's Pools (about nine miles south of the city) to Jerusalem. This fountain is supposed to be the work of Solomon and to be alluded to in the Song of Solomon in the words, "My beloved is like a spring shut up, a fountain sealed." It is a deep-down subterranean spring which has, from the time of Solomon, flowed through the arched tunnel built by him to the distributing chamber or reservoir near the north-west corner of the highest of Solomon's Pools. Half a century ago the location of this "hidden" spring, which was still, as in Solomon's time, flowing into the reservoir mentioned, was unknown. The tunnel is roofed by stones leaning against each other like an inverted V, the primitive form of the arch, which is also seen in the roof of the Queen's Chamber of the Great Pyramid. The entrance to this tunnel from the spring is one of the oldest structures in existence. The piping is to be laid along the old aqueduct which formerly, from the time of Solomon, brought this same water to the Temple area. It will require about 20,000 mètres of piping, and several English and Continental firms have been telegraphed to for offers to supply it. The course of the aqueduct is down the valley in which Solomon's Pools are built. Just below the lower pool the waters of Ain Etam join and augment the flow from the Sealed Fountain. At a little distance further down the valley the beautiful site of the ancient Gardens of Solomon, watered from these pools, is passed. The planting of these gardens, as well as the building of the pools of water, is mentioned by Solomon in the book of Ecclesiastes. Here now is Artas, a village in the still well-watered and fruitful valley. Here also has just been erected a Roman Catholic convent, built by a South American bishop at a cost of £15,000, where the nuns of the order of the Daughters of Solomon will conduct a school for Armenian Catholic orphans. Further on, the course of the aqueduct passes Bethlehem, and on northward past Tantour, where live the successors of the real order of the Knights of St. John, past Mar Elias, where Elijah is said to have rested in his flight from Jezebel; then it crosses the historic plain of Rephaim, where David, in the heat of the battle with the Philistines, longed for water from the well at Bethlehem; and finally, after passing around the slope of Zion, it enters the city through the grounds of the mosque of Omar, the old Temple area.

There are eleven or twelve ancient fountains here and there in the city, long unused but now to be utilised, and from which the water may be drawn free to all, several taps being attached to each fountain.

Another work of interest is the successful repairing of

The Virgin's Fount

in the Valley of Jehoshaphat, just outside the city walls. This is a fountain of brackish water with a small intermittent flow. That is to say, after several hours' flow there occurs a short interval during which the water ceases. It is the only fountain which Jerusalem possesses. Its waters pass to the Pool of Siloam through a tunnel on the wall of which was the oldest Hebrew inscription extant. A few years ago this inscription was surreptitiously cut out from its place and stolen, but was recovered by the Turkish authorities before it had been taken out of the country, and is now one of the most interesting objects in the Constantinople museum. About the same time efforts were made by blasting to increase the flow of water from the fountain, which resulted in a greatly diminished flow and in its ceasing altogether in the summer months. Some Siloam villagers undertook to restore the spring to its former effectiveness, for which they were to receive from the municipality 100 napoleons if successful. They found and closed the breaks through which the water was lost, and it is now flowing as formerly, to the great joy of the Siloam people, whose chief source of supply it was.



EASY STEPS IN CONNECTION WITH DRY-WALLING.

LOUGHBOROUGH'S MUNICIPAL OFFICES.

THE Corn Exchange at Loughborough now wears an entirely new aspect. A large stage has been added, and the old platform taken away. It has been fitted in the rear of what used to be the old hall, there being dressing-rooms at the back and store-rooms underneath. Another feature is that corridors of good width have been provided. Originally the only way out of the hall was through the front entrance and by means of the doorway which communicated with the town hall passage. Now there are seven exits. Accommodation has also been made for 120 more people, making the total accommodation something like 750. All the doors open outwards and are fitted with panic bolts, as is also the exit door in the town hall passage. The old council chamber will in future be used as a lecture hall.

On the north corridor, and on the land purchased from the bank, has been constructed the borough accountant's office, clerk's office, a cloak-room and lavatory, and a committee-room on the ground floor 36ft. by 16ft. At the back come the kitchen, scullery and pantry, fitted up to provide for a large number of people; in fact, it is estimated they will be able to cook for about 400 people.

In the west corridor lavatory accommodation is provided, and between the south corridor and the town hall passage are the new offices, which include the borough surveyor's private office, drawing office and clerks' offices. These are contiguous to the south hall, and have communication from the town hall passage to the south corridor. The borough surveyor's office is also the waterworks office. On the other side of the hall is the public rate office and private rate office. There is also another room allocated to the sanitary inspector. At the end of the south corridor is the artistes' entrance to the stage and the public staircase to the council chamber. Upstairs is the council chamber, mayor's parlour and councillors' retiring-room. There is a cloak-room and lavatory attached.

Reverting to the Corn Exchange, we might mention that the lighting and ventilation of the building has been thoroughly overhauled. The old chandeliers have been discarded and replaced by two brilliant sun-burners. There have also been about two dozen inlet ventilators put in, and the fresh air is drawn from the outside of the building and not from the corridors.

The whole of the works have been designed by Mr. A. H. Walker, A.M.I.C.E., borough surveyor, and it is anticipated the offices will be ready for opening in about a week's time, while it is hoped to get the whole of the buildings ready for October.

The premises are heated by low-pressure hot water by Messrs. Messenger & Co., and the contract has been executed by Mr. W. Moss & Sons, Ltd., the total cost being something like £6,000. Messrs. G. Gascoyne & Son, of Nottingham, were entrusted with the glazing.

The old town offices in Ashby Road have been let to the School Board, who in turn have sublet two rooms to the Guardians. The removal of the town offices to the new premises will also allow a slight extension to the Free Library, which is now about to occupy an extra room.

THE NEW PUBLIC OFFICES.

A Defence of the Government's Action.

A CORRESPONDENT to the "Times," in an article on the new public offices, says:—

No Minister in recent times has done more for the improvement of the Metropolis, for the good administration of his office, and for the gratification of the public than Mr. Akers-Douglas; yet, if Lord Wemyss is to be believed, no one is less qualified for the office he holds than the present First Commissioner of Works.

The President of the Academy led an attack upon the scheme, carefully considered as it had been by all the authorities concerned, for a great street improvement; and although that eminent critic did not summon up courage to attend and argue the point with Mr. Akers-Douglas when invited to do so, his polite description of the plan as "idiotic" was endorsed by many who, after hearing the First Commissioner's explanations, must have regretted their hasty acceptance of Sir Edward Poynter's views.

Now Lord Wemyss returns to the charge upon another controversial point, upon which the First Commissioner has had no opportunity of explaining the grounds of his action.

By an extraordinary fatality, the two eminent architects entrusted with the designs of the great public buildings in course of erection in Whitehall died within the space of a few months. Their designs had been completed and had been exhibited for the information of Parliament. They had met with very general approval, the contracts for the foundations had been accepted, and the work was in course of being carried out.

On the death of Mr. Young the First Commissioner decided to complete the work under the joint supervision of Mr. Clyde Young and Sir John Taylor. To this no objection was apparently taken.

On the death of Mr. Brydon a precisely similar question arose, and the First Commissioner decided that the work should be carried out by Mr. Henry Tanner, under the supervision of Sir John Taylor. It seems to be assumed that this decision was taken for financial reasons. This is not a fact. The main motive which actuated Mr. Akers-Douglas was regard for the comfort of the great body of public servants who will be called upon hereafter to occupy the building in question.

The chief concern of the public with both the new War Office and the buildings at the corner of Parliament Street is their outward form. This has been decided by the employment of the deceased architects, whose names will always be associated with the buildings in question. The internal arrangement of these offices is a matter of deep concern to the men who will have to spend long and arduous days within their walls.

In former times very little attention was paid to this not unimportant matter. The externally beautiful building which contains the Treasury is one of the most hopelessly unsatisfactory public offices which could be well imagined. Badly-designed rooms, incommodious passages, inferior ventilation and lighting, and waste of space comprise a conglomeration of every fault, from the point of view of the transaction of public business.

The building erected in Chancery Lane (one of the most beautiful in London) for the Record Office is internally perfect for the purpose for which it was designed by Sir John Taylor. The General Post Office North, designed by Mr. Henry Tanner, is as satisfactory a building for official purposes as could well be constructed. The Admiralty, for the internal planning of which the architects responsible for the building would readily admit their great debt of gratitude to Sir John Taylor, is—from an official point of view—almost without a fault.

It is not surprising that, with these experiences to guide him, Mr. Akers-Douglas should have hesitated to deprive himself of the services of those architects connected with his office whose knowledge of official requirements are unrivalled in the profession. Sir John Taylor's name stands high among living architects. It is true that Mr. Henry Tanner is less well known; but when Sir John Taylor was entrusted with the building of the Record Office he was not well known to the public, but the choice was amply justified. Time will in like manner justify the decision which Mr. Akers-Douglas has taken.

There is a further reason which weighed strongly with the First Commissioner. It has been too readily assumed that an eminent outside architect could be found to carry out Mr. Brydon's fine plan. Enquiries made with some care did not bear out this assumption. Eminent architects are men of strong individuality, deeply committed to their own ideas of art, imbued with their own notions of style, and, as a rule, absorbed by works of their own design, with very little time and less desire to bestow upon the work of others. It became speedily clear that, if an outside architect was to be employed, it would have to be a man of the second or third rank in his profession—assuming that the plan and elevation designed by Mr. Brydon were to remain unaltered. The First Commissioner not only considered that it was due to the memory of Mr. Brydon that his building should be erected according to his design, but he determined, for the sake of the intrinsic merit of the design itself, that this should be done.

These, then, were the reasons which actuated Mr. Akers-Douglas in recommending to his colleagues that the new building should be carried out under the superintendence of the architects of the Office of Works. Financially it is highly improbable that any saving will be effected. The design has been paid for, and the executors of the late Mr. Brydon have received the money. The remainder of the sum set aside for "commission" will be employed—as it would have been by Mr. Brydon had he lived—in remunerating the subordinates who have to carry out, from day to day, over five or six years, the work of variation and superintendence.

If, when the War Office and the great group of public offices at the corner of Parliament Street are erected, they prove worthy of their magnificent site, the credit will be due to Mr. Young and Mr. Brydon, who designed them; and if they prove satisfactory as official buildings, fulfilling the requirements and adding to the comfort of the public servants who will occupy them, the credit will be due to Mr. Akers-Douglas for bestowing his confidence upon two of his own officers who have not hitherto abused it.

A CASTLE MOAT WITH WILD FLAGS AND WATER-LILIES.

A New Town Hall and Assembly Rooms at Cheltenham are to be erected at a cost of £35,000 upon a portion of the Winter Garden site, on the north side of the glass structure.

ST. PETER'S HOSPITAL, BRISTOL.

THE new boardroom at St. Peter's Hospital, Bristol, is rapidly approaching completion. A little over one-third of the old premises was pulled down for the new buildings, but the quaint gabled front in Castle Street, which is of considerable archæological interest, has been saved. The contractors for the work are Messrs. Stephens & Bastow, and the architect is Mr. W. E. Skinner. In the basement of the new building, on a level with the main entrance passage, are three offices for the clerk to the guardians, vaccination officers, settlement clerks, &c., and the superintendent registrar's office has been enlarged. The new boardroom is on the first floor, on a level with the old room. It is built entirely of panelled Austrian oak. There is a large oblong-shaped sunlight in the roof, and this is painted white. At the top end of the apartment is a raised daïs for the chairman, and the front of this is also in panelled oak. The room is more than double the size of the old room. It contains 65,000 cubic feet. The new premises also include ladies' and gentlemen's cloakrooms, a chairman's retiring-room, and on the top floor apartments for the use of the caretakers, &c. The estimated cost of the work is £2,196, and this is exclusive of the furniture.

Before the old boardroom passes into disuse, so far as its present purpose is concerned, it may not be uninteresting to say a word about its historic features. The room itself is made of panelled oak, and is at least 600 years old. There are a fine ceiling and fireplace of a later date—the Elizabethan period, in fact. The existence of this ceiling was unknown a comparatively few years ago. At that time the room was being overhauled, and it was discovered that underneath numberless coats of whitewash—the accumulation of centuries—was this fine Elizabethan work. It is picked out in gold and orange, in keeping with its original design. The fireplace is of similar design, with the royal arms in the centre. It has a fine open-timbered pointed roof of fifteenth-century date, which is equal in construction to the ordinary ecclesiastical work of the same period. The door and doorway inside the room are most beautifully carved. The original mansion was erected about the end of the twelfth century by John Norton, and extended from St. Peter's Churchyard to the river. It was the property of Robert Chambers in 1600, and seven years later he sold it to Robert Oldworthy, whose tomb is in the adjoining church. Whilst it was in Oldworthy's possession the house underwent extensive renovation, and it was probably at this time that the ceiling and fireplace were constructed. After this the building was used for various purposes, until it came into the possession of the Bristol Incorporation. In the boardroom are a couple of very old massive carved oak tables, and a chair which is now used by the chairman of the guardians. This chair is of carved oak, and bears the date 1696.

BRIDGE WITH WILD OVERGROWTH, SHOWING A GOOD COMBINATION OF MASONRY AND VEGETATION.

CLEY CHURCH, NORFOLK.

To be Restored by Mr. Micklethwaite.

FOR a year past a movement has been on foot for the complete restoration of St. Margaret's Church, Cley-next-the-Sea, an object which will involve an expenditure of about £7,000.

Mr. J. T. Micklethwaite, the eminent ecclesiastical architect, has made a very full report on the present condition of the fabric and the repairs he considers necessary to preserve it.

The church was built long before the thirteenth century, which is the date of the oldest work now to be seen. The building was probably completed as it now stands towards the end of the fifteenth century and the beginning of the sixteenth, although the pulpit and other parts of the furniture are of still later date. The font is a good example of a type common in the better-furnished churches in East Anglia. Seven of its sides have representations of the Sacraments, and the eighth one had the Crucifixion. Fanaticism has done some harm to the font, and hard usage and neglect some more, but it remains a good font and needs little doing to it except some repair to the step. There is in the chamber over the porch an oak cover which belongs to the font; it is of the seventeenth century; it is a handsome thing of its kind, and should be replaced. A number of very good pew-ends of the beginning of the sixteenth century are worked up into the modern fittings, and six chancel stalls of the same date remain in the chancel, though they are not in their original places. The pulpit is of the seventeenth century, and is a fine one, in good condition.

Among the other interesting features of the church may be mentioned a fifteenth-century sun-dial, a number of emblems, shields and brasses, and some miserere stalls the carving of which is worthy of inspection. Mr. Micklethwaite says :—

I find that the masonry generally is in fairly good condition, though in many places small repairs need to be done, and in some places missing parts to be supplied.

No Copyism.

The north aisle has lost its parapet, and should have a new one when the roof is repaired. The new parapet should not be a copy of that on the other aisle, but, whilst designed to harmonise with its surroundings, should show itself to be the work of our time. The ivy is doing harm, and should be taken away altogether. If it is left to go on unchecked in the roofless parts of the chapels and the west porch, it will soon bring the walls down. There is some settlement in the tower, which ought to be watched, but so long as there is only one bell, as now, I think it is not likely to get much worse. The bell storey, which is part of the fourteenth-century work, needs attention. Three of the windows are gone, and the fourth is likely to fall out unless taken care of, and there is a good deal of making good wanted to the walls.

A vestry which once stood on the north side of the chancel is entirely gone. It would be useful if rebuilt. There is much damp in the walls, partly due to defects above, but chiefly to the ground outside being in many places very much higher than the floors inside.

On the south side, and elsewhere where it can be done, the ground should be lowered to 6in. below the level of the floor for not less than 6ft. from the base of the wall. But on the north side the floor has from the first been below the ground level, and is so now by many feet. To cut the ground all away would be difficult on account of the graves, and would probably expose the foundation to injury from the weather. I think the best course will be to form a dry area on that side, vaulted over at the level of the ground. The area should be about 2ft. wide and accessible, so that it may be kept clean, and it should be well ventilated. As to the open parts of the chapels, it will be best to clear them of ivy and weeds, and to protect the walls as much as possible from the infiltration of water, but otherwise leave them alone. The west porch ought to have a new roof, that it may serve as a protection to the west doorway, which shows signs of injury from the weather.

Roofs.

The roofs of the nave and chancel are modern. It would be well to replace them with something of better character; but that, not being a work of necessity, must be postponed to others which are. Meanwhile some amelioration may be effected at small cost by painting. The roofs of the aisles and of the south porch are of the fifteenth century, but in so dilapidated a condition that, in estimating for their repair, it is necessary to reckon as for new work. Nevertheless a large part of the carpentry can and ought to be saved. Many timbers are sound except at the ends, and new ends can be fitted to them. But the full extent of the mischief will not be seen till the roofs are uncovered. They should, when repaired, be boarded with oak boarding, over which felt should be spread, and an air space of about 1in. provided between that and the deal boarding to receive the lead. The lead itself should be recast in or near the churchyard, with the addition of new, and laid in the old manner—without the use of wood rolls.

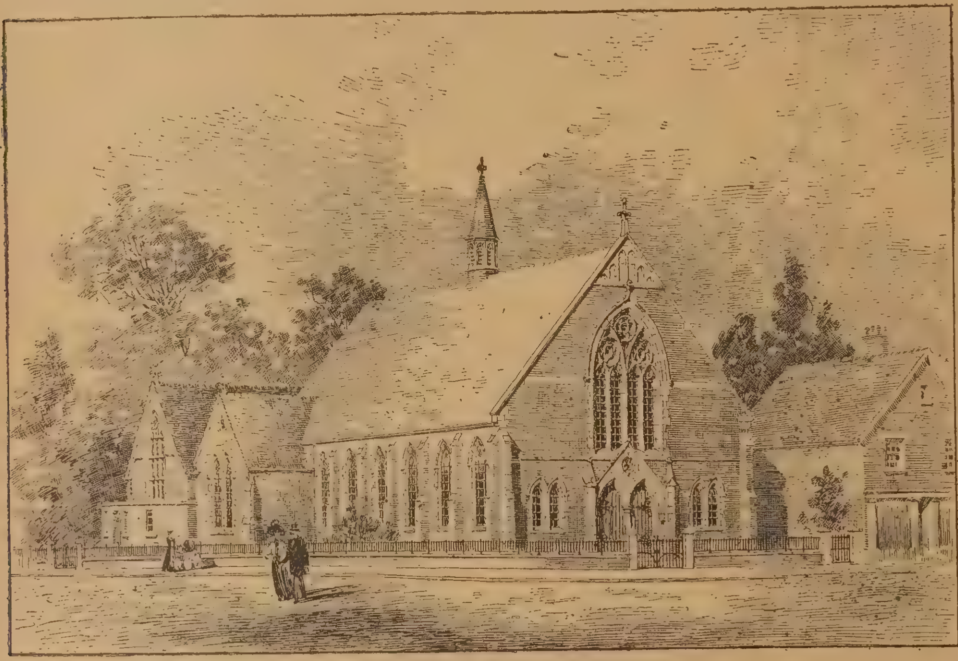
The south aisle is in the worst condition of the two, and its repair should be the first work undertaken. The roof of the porch should go with it, and I reckon roughly that the cost would be between £800 and £900. In this I have not included the portion of the transept chapel within the church, which does not call for immediate attention. When its turn comes it must have a new roof. The repair to the north-aisle roof should come next; and when these roofs and the lowering of the ground are done the rest of the work may be taken in any order most convenient. It will be quite possible to do all that is wanted without putting the church out of use.

Warming the Church.

The only satisfactory way of warming so large a church as this is by water. But it must not be pipes covered by gratings in the floor, through which all the dirt brought into the church is swept down upon them. Radiators connected by covered pipes will do the work better, and they will not disfigure the church more than the floor grates would. When the church is properly warmed there will be no more need to enclose the part of it in ordinary use, as is done now, and in rearranging the building it may be well to provide a little more pew accommodation.

The pulpit stands well and needs no change. The floors of the nave and aisles are generally good enough to keep, and there are in them many interesting grave-stones, some with brasses. The chancel needs to be fitted up for the use of a choir. The altar, which has in it parts of an altar of the time of Charles II., is sufficient, and the old stalls should be kept, but everything else will have to be new. A screen is so necessary to the church that if a good oak one cannot be afforded at present I advise that a simple screen of painted deal be put up, to remain till better may be had. There is not any place in the church suitable for a large organ, nor can one be provided without injury to the building. But a large organ is not wanted, and I advise that you have instead one of Casson's "Positive" organs. In a church so large as this it is convenient to have a side altar for use at services when the attendance is small, and there is a good place for one at the end of the south aisle. The vestry at the north of the chancel ought to be rebuilt, and it may be made large enough to serve a small choir. But if a special choir vestry is wanted it must be provided elsewhere. It has been suggested that the west porch might be adapted to this use; and if the west door is not wanted for a public entrance, which I think it is not, this might be done. The lower storey of the tower might also be made into a choir vestry. The tower itself needs a good deal to be done to it, but it may be left to the last. The masonry and the roof want much repair, and all the floors must be new. It would be well to add one bell to that already there, but the tower is not fit to receive a ring of bells.

The committee propose doing the work in sections as under: (1) Roof of south porch and aisle, (2) roof of north aisle, (3) west porch, (4) external masonry. The work on section 1 is already making considerable progress.



NEW WESLEYAN CHAPEL AND SCHOOLS, STAPENHILL, BURTON-ON-TRENT.
THOMAS JENKINS, ARCHITECT.

NEW STAPENHILL WESLEYAN CHURCH AND SCHOOLS.

THE memorial stones of the new Wesleyan Methodist Sunday Schools which are to adjoin the chapel at Stapenhill were laid recently. The new buildings will be set back from the street, and enclosed within a brick and iron palisading. The chapel will be approached from Ferry Street by the two large entrance doorways which have been designed to make a central feature. These lead into a large vestibule extending the whole width of the chapel, and thus form a convenient lobby for waiting, and hats and cloaks. The chapel will afford accommodation for 400 adults—190 in the central nave, 136 in the side aisles, 50 in one transept and 24 (together with the organ) in the second transept, this latter forming the choir. The roof will be of pitch-pine, and the whole of the constructional timbers will be ornamented, wrought and varnished. The schoolroom will be built at the back of the chapel, and will be connected thereto by means of a large archway, to be filled in with a framed wooden screen, which will be easily taken down when the two buildings are used for special services, school anniversaries, &c. The chapel will be lighted by means of one large four-light window in the front gable, two two-light windows in the transepts, and twelve single-light windows in the aisles. The transepts will be divided from the nave by octagonal stone pillars and arches. The schools will have the entrance from the Dingle, and will provide accommodation for 300 children. These will be provided with two cloakrooms adjoining the entrance vestibule, and at the other end of the schools will be separate lavatory accommodation for boys and girls. The other buildings comprise a minister's vestry, with a separate entrance to the school and chapel, and a kitchen (with the heating apparatus) in the basement below. The heating will be on the low-pressure system, and ventilation will be secured by means of numerous air-inlet panels and roof exhaust ventilating pumps. The drainage will be perfect, and where the pipes in one place pass under the kitchen and passage they will be cast-iron and lined with glass. The buildings are designed in the Early English style of architecture, and externally will be of pressed red bricks with white stone dressings, and the roof covered with red tiles. The glazing will be of tinted cathedral glass in plain ecclesiastical leadings. The contractors for the buildings are Messrs. Thomas & Sons, whose estimate has been accepted at £2,240, and the architect is Mr. Thomas Jenkins, of 35, High Street, Burton-on-Trent.

For the use of the block illustrating these buildings we are indebted to the "Burton Mail."

A SOLDIERS' INSTITUTE.

A CHURCH OF ENGLAND Soldiers' Institute has been erected at Bulford, for the use of troops who from time to time inhabit the huts on Salisbury Plain, at an estimated cost of £6,000. Messrs. Wort & Way, of Salisbury, were the builders, their tender amounting to £4,250 for the building alone. The architects were Messrs. J. Harding & Son, of Salisbury. The building is of one storey, built of timber-framing on concrete foundations, covered with galvanised iron on the outside and lined with felt and matchboarding inside. The roofs are also covered with galvanised iron and similarly lined. The chief feature of the Institute is a large hall 115ft. in length and 42ft. wide. Its height is 11ft. to the springing of the roof and 21ft. to the ridge. This is intended to be used for services and also for entertainments, and will accommodate over 700 men. It is divided into two parts by a rolling shutter, and when not in use for services, &c., one part will form a recreation-room and the other a store-room for spare chairs. The buildings, which are at present lighted with oil lamps, will ultimately be lighted by acetylene gas, generated in a small separate building. The room is also well ventilated and is furnished with panic exits for use in case of fire. At the end of the hall there is a devotional room 32ft. 6in. by 20ft. This is divided from the large hall by a sliding partition, and when the hall is used for divine service will serve as a chancel. At other times the devotional room will be used for daily services. There is a large room on each side of the devotional room, and these will be used as vestries, or as dressing-rooms for entertainments. They are provided with separate entrances. A refreshment-room opens out of the large hall, but is on a somewhat lower level. Its dimensions are 41ft. 6in. by 32ft., and is furnished with a marble counter 32ft. in length. Outside there is a long verandah, where refreshments will be served during fine weather. Adjoining the refreshment-room is a kitchen 32ft. long and 20ft. wide. This is fitted up with two large ranges. Adjoining the kitchen there is a small servants' hall, a copper room and a cook's store. On the east side of the last are placed two small rooms which may be used as private dining-rooms or for various other purposes. There is also a large lavatory fitted with hand-basins and supplied with hot and cold water, and six bath-rooms. The caretaker's house is connected with the main building, and contains twelve rooms, some of which can be used as rooms for visitors. On the basement floor is a good storage cellar, and also a separate large cellar containing a furnace which will supply steam to radiating coils with which the Institute is to be heated throughout.

ON COMMERCIAL TRAVELLERS.

BY AN ARCHITECT.

A RECENT writer in this journal has contributed a most interesting article upon my profession as viewed by a commercial traveller. It may be of some value at this juncture, therefore, to have also the opinion of an architect upon travellers as they are and as they might be; not that my experience of them has been such as to lead me to find fault with them, but, as with every other class of mankind, there are travellers *and* travellers.

Now, unfortunately, in my calling, and as I venture to think also unfortunately *for* it, the commercial traveller is pretty usually classed in the same category with flies and mosquitoes—"nuisances, pests that must be endured." He is generally looked upon as a man whose only duty is to call upon you and waste as much of your time as possible; he carries with him ½in. scale models of closet-basins, or patent ventilators, or, worse still, gaudily-coloured cards of large area whereon are depicted mosaic or other monstrosities, which cards are fitted with hooks and hanging cords complete, ready to be hung in your outer office to become an eyesore to callers and to be a perpetual check upon the incipient artistic tendencies of a budding pupil. That there are many commercial travellers of this type no one will probably attempt to deny, but the fault lies not in the representative but in the firm of manufacturers who distribute such unsightly trash in endless quantities by this means. Even when the traveller does not call with this miserable literature it is forwarded by post, and at Christmas-time the architect's office is inundated with calendars, almost all of them devoid of any attempt at artistic treatment, but usually with great spaces of paper covered by blatant figures in red and black, an inch high, and the name of the month, thus: "September. Send postcard for full particulars of our patent 'Useless' ventilator." Who of us does not know the calendar from which you tear off a page every day and have your feelings harrowed by reading that to-day is July 23rd, and that "'Odours' patent trap is the best on the market" (accompanied by a feeble woodcut of same)?

It is *this* which in the outset renders the commercial traveller an unwelcome guest in our offices; for the rest, sometimes it is the traveller's own fault, but more often it is the architect who is to blame.

The head of the office has grown up in the orthodox belief that a "commercial"—"*only* a commercial" is the usual phrase, and is sufficient of itself to show that the traveller is systematically despised—has no right on an architect's premises, and he carefully inculcates the same idea into every pupil, office boy or draughtsman who enlists under him. When the unfortunate bagman calls he is told—I said it myself scores and scores of times in the days of my pupilage—that "Mr. So-and-So is very busy to-day and cannot see you," quite irrespective of whether the said Mr. So-and-So is up to his eyes in work in the next room or whether he is sitting there leisurely reading his morning paper. In thus dismissing the traveller unheard, the assistant is only carrying out instructions received from his principal, and I doubt whether the principal even is informed that the representative has called. In many offices there is a notice put up on the door to the effect that travellers need not call—just the same as one puts "No Bottles" over the area door to rid oneself of rag and bone men. I do not know what the traveller does under such circumstances, but I presume he goes away in disgust, for there is little doubt of the treatment he would receive if he so far forgot himself as to enter the office.

This treatment is a crying shame in our midst. It is unkind and heartbreaking to the traveller, who is, after all, a man like ourselves, with a heart and finer feelings, and who has his living to get; and also it is unwise and unjust to the architect himself. I am aware that many architects will consider a statement like this heresy and insanity, but I can justify the position I have taken up in every particular; and if I end by winning a few over to my views and obtain in the future a better reception for that fellow-worker the commercial traveller, these words will not have been written in vain.

It is unjust to the traveller for this reason. Between the architectural Lazarus and the commercial Dives a great gulf is fixed, either by the notice on the door or by the cordon drawn across the office by the pupils and other lesser lights of the profession, only, unlike the Scriptural illustration, Lazarus is ignorant that the commercial Dives is calling upon him. So it frequently happens that while the architect sits in his office writing to a certain firm for information upon their goods, the representative of that very firm is being told at the door that there is "nothing on," when he could have saved the time of his employers as well as of the architect. Nor is this all. Suppose now that a traveller having "worked" Manchester reports to his firm that he has called upon every architect in that city, and suppose also that the above-mentioned architect resided in Manchester and sent his enquiry to the traveller's firm so that it arrived by the same post or shortly afterwards; what is the result? The firm immediately concludes that their representative has neglected to call upon this architect, and if this is so in one case, is it not possible that he is not doing his work? And so the poor commercial is severely reprimanded, possibly dismissed, for absolutely no fault of his own, but through the thoughtlessness—it must be thoughtlessness—of the architect. So much for the injustice to the traveller; now for the architect's own injustice to himself.

Our architecture of to-day depends rather more perhaps than we care to admit upon the men who manufacture our materials for us, and these men, each in his own distinct sphere, are constantly spending money and thought in improving their goods, inventing new methods and contriving new fittings and similar details. The architect, to keep up with modern progress and to maintain his position in the ranks of his profession, must be ever ready to give each such invention or improvement at least a fair hearing, if not an actual trial. But how is he to hear of these things? If the manufacturer merely places his new speciality in his catalogue it is usually submerged in such a sea of thousands of other things that it scarcely ever reaches the architect's eye, and still more rarely makes any impression upon his memory. As often as not the whole catalogue is consigned to the waste-paper basket under the table, whence an unsympathetic caretaker removes it and sells it as "old clean paper." Should the manufacturer elect to send notices of it out as a separate paper or pamphlet, it usually arrives in an unsealed envelope, with a halfpenny stamp or "postage prepaid" on it. This immediately betrays its identity to the busy architect, who has many important letters to deal with by the same post, and he unconsciously says to himself "Circular" as he takes it out and tears it up unlooked at. Thus too this method fails to obtain notice for novelties, be they good or bad. And so it is only the commercial traveller who has any chance of obtaining a hearing for his wares; he at least cannot be torn up or sold for old paper. The manner in which he is treated has already been set forth both in the former article by a "Commercial Traveller" and in this present one.

A certain great author who was remarkable for his general knowledge of things was once asked how he managed to acquire so much information, and his reply was very much to this effect: "Try and cajole every person you meet to talk to you upon that subject of which he knows most; lead a country Hodge to speak of pigs and potatoes." This is a saying which may well be taken to heart when dealing with travellers, for often, though certainly not always, they are enthusiastic over their wares and manufactures purely and disinterestedly on account of the sterling value of these commodities, and they know more intimately than the architect ever can the possibilities of the material they are striving to bring before his notice. Not always, I say, because there is a large class who can only be described by that one word, "Bounders," but I have invariably found that men of this calibre travel only with goods as second-rate as themselves. This type comes into the office with more bounce than a millionaire client and generally speaks in a loud voice, possibly in the hope of attracting the principal from his sanctum to discover the cause of the disturbance, and when thus attracted he is pounced upon by the irrepressible commercial. He is *forced* to behave in this manner because he feels somewhere inside him (though he never allows himself even to think it) that he is a cad and his goods are in keeping. Therefore he puts on bounce and adorns his person with what is really incongruous raiment and boldly claims that his goods are "far better than Messrs. So-and-So's and half the price." He rarely troubles to say what their merits are, and if he does he will never guarantee them *personally* when brought to the point.

On the other hand, the respectable commercial traveller, to which class by far the greater majority belong, is conscientiously satisfied that the heavy articles he drags round England day after day and week after week are thoroughly good. He is polite, wonderfully patient (all things considered), and will put himself and his firm to endless trouble to assist architects to his utmost. He is more often than not an expert in his line, and five minutes' talk with him would give one more insight into this particular material than whole hours spent conning over treatises and fingering samples. I say this from experience, for, since the first day that a traveller caught me in the outer office and convinced me of the value of men of his calling in the scheme of creation, I have ever, when free to do so, laid myself open to seeing them, examining their merchandise, and hearing what they have to urge in its favour. I have found them, except the small class already noted, self-respecting gentlemen, knowing the value of their wares and content to leave their future trial to the discretion of the architect, without proceeding to puffing and the production of press notices and a list claiming that every architect that ever lived has used this particular article of commerce ever since Noah designed and built his ark! Within the last few weeks a traveller came to me with a model of some patent folding partitions—and they were, without doubt, the very best possible contrivance that could be used under many circumstances: they folded up, they folded down, they went round the corner, and when you had finished with them they folded up flat against the wall, and practically no space at all was taken out of the room. My object in mentioning this is that had I adopted the usual practice and refused to hear this caller, I should still be in happy ignorance that anything so compact and useful had ever been invented; for he called with his model, left his card and then went on his way. It may be mentioned here that it is not the usual practice for a traveller to say his say about his goods and then go off to continue his journey; and while I quite agree that a traveller *may consider that it is necessary* "to talk to a man on his own ground as well as your own," and be able to discuss James I. or the French Revolution or what not, it gives neither the architect nor the traveller a good opinion of the business capacity of a man who wastes his own and other people's time in introducing such foreign and out-of-place subjects during what ought to be from its very nature a strictly business interview. I have had considerable experience of this phase of the commercial traveller as well, and have unwillingly been drawn into discussing Unitarianism and other matters when I would far rather have been left free to return to my drawing-board and get on with my work.

Let architects and travellers learn to have a wholesome regard for each other—the architect for the work and feelings of the traveller, and the traveller for the value of an architect's time. Let manufacturers, the prime cause of all the evil, exercise a little care and tact in their leaflets and contrive to produce a sensible and modest notice which shall not offend an artistic mind. Above all, let these last-mentioned manufacturers select their travellers with care, choose gentlemen of business instinct and not cads of great pushing capacity; for to send one of these latter to interview a respectable architect (given that he succeed in reaching him) is disastrous to the manufacturer's chance of doing business, and tends to bring commercial travelling as a calling under quite unnecessary and generally undeserved opprobrium. I have in my mind at this moment a glaring instance of tactless traveller's work which bears out what I have said in the fullest degree. There is a certain (second-rate, as will be seen) firm in London who manufacture drawing materials and employ travellers to hawk them round the country. One of these has called upon me here occasionally and has never yet left my office without raising in my bosom an unchristian desire to throw him into a horsepond for a flashy and dishonest cheapjack. I fancy he considers himself a splendid man of business, and he has a method of attack which is all his own. He begins with dropping long shots—that is to say, about a week before he descends upon you, to jar your feelings and make you vow internally never to patronise his firm, he sends you a highly glazed pink-on-one-side-and-white-on-the-other "business" card announcing that "our Mr. X. Y. Z. will call upon you in a few days to introduce," &c., &c. Well, I waited for my beheralded traveller with much interest. He came; he was just the type of cad I expected to see. I gave him an order. The goods on arrival were inferior and not even of the sizes he had mentioned. This man still calls and still (kindly) warns me by post of his pending visit—and, like probably every other architect, I am *out* when he arrives on my threshold. The moral is obvious.

Builders' Notes.

A New Hospital for London.—The Local Government Board have sanctioned the erection of a new hospital in South London at a cost of £284,000.

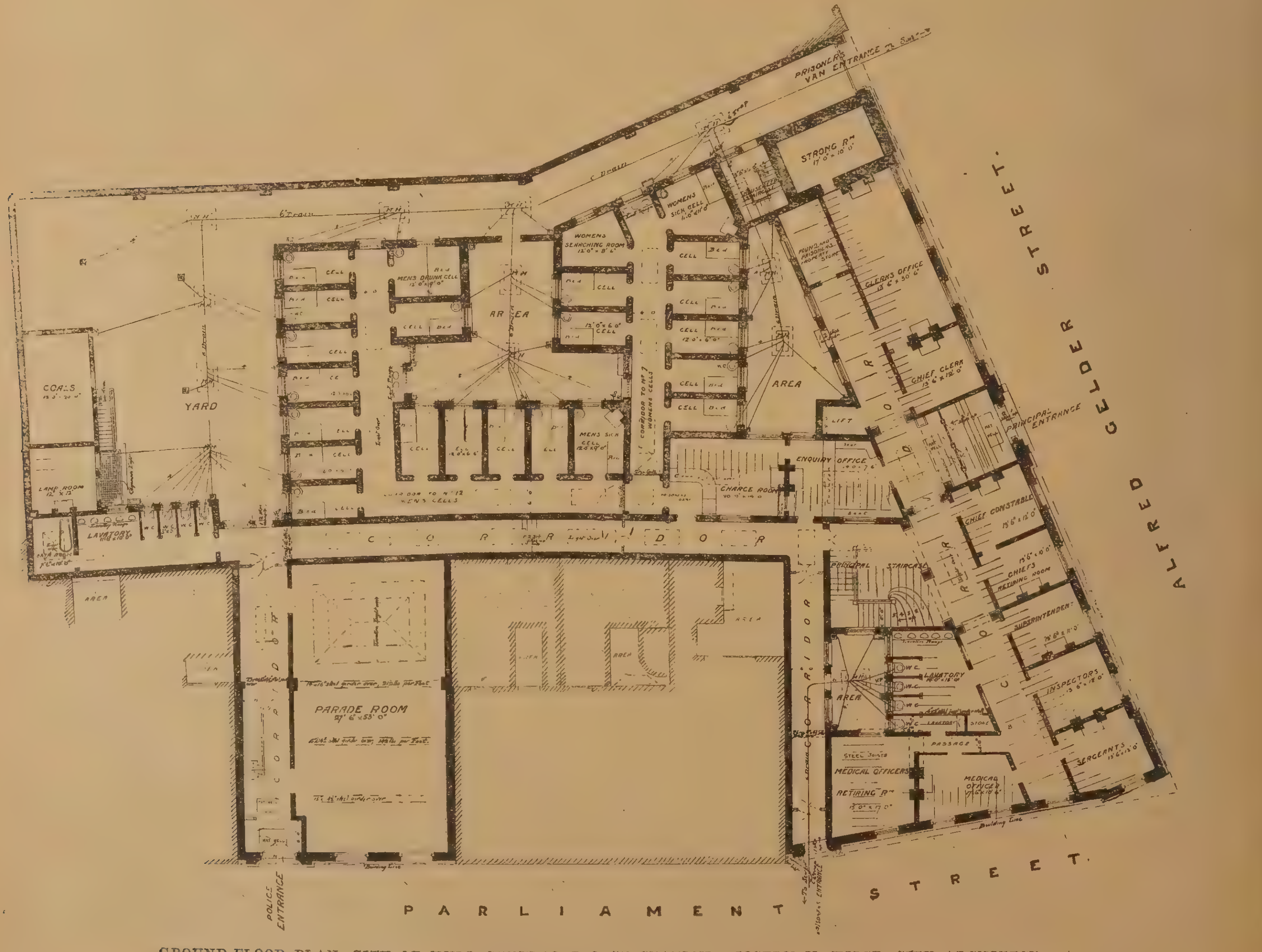
The Isolation Hospital, Ystrad, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, with descending smoke flues and patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A New "Prismatic Rolled Glass" is being made by Messrs. Pilkington Brothers, Ltd, at their St. Helens Glass Works. The section of this glass shows a saw-like edge, with the teeth pointing in an upward direction. Glazed as directed, it adds considerably to the illuminating power of a window and is most valuable for lighting rooms ordinarily dark. It is made up to 38in. high or 90in. wide. Any smaller size within these limits can of course be had.

A Builder's Failure.—A first meeting of creditors has been held under the failure of Charles Simmonds, a builder, of Leytonstone. Since 1889 the debtor has built about 400 houses, chiefly in the neighbourhood of Forest Gate, but also at Thornton Heath, Barking Road and Ponder's End, the necessary capital being obtained principally by advances under building agreements. The accounts show liabilities £25,379, of which £23,020 is treated as fully secured, and an estimated deficiency in assets of £2,270. The case was left in the hands of the official receiver.

The Peterhead Master-Builders' Association held its annual meeting recently, Mr. Alexander Webster, president, in the chair. The following office-bearers were elected for the ensuing year: President, Mr. Alexander Milne, engineer; vice-president, Mr. J. B. Dickie; committee: Messrs. J. Ferguson, plumber; A. Ferguson, painter; A. Webster, builder; James Taylor, junior, builder; Shand, plasterer; West, builder; and Williamson, blacksmith; secretary and treasurer, Mr. A. Clark Martin, solicitor. Messrs. J. B. Dickie, W. Stuart and A. Webster were appointed delegates to the annual meeting of the Scottish Building Trades' Federation.

Technical Building Instruction in Australia.—Mr. Gurr, the Minister of Public Instruction at Melbourne, was recently asked by a deputation from the Plasterers' Union supported by the council of the Working Men's College and the Trades Hall Council, to grant a sum of money to enable a class to be started at the college for instruction in plastering. The decadence in the apprenticeship system throughout Victoria and Australia was referred to, and it was stated that employers only partially taught boys their trades, and it was only by means of technical schools that skilled artizans could be turned out. The formation of a plasterers' class would not be expensive, as a suitable small iron shed could be erected on the ground floor at a trifling cost. It was thought that the Government should go further, and provide facilities for teaching the cognate trades of bricklaying and stonemasonry. Several plasterers addressed the Minister, complaining that there was no means of properly learning the trade in Victoria. Many who were reckoned tradesmen were quite ignorant of the higher branches of the calling. Only plasterers or plasterers' apprentices should be enrolled in the class. They did not want men who earned their living in other ways to come in and "play" at the classes. Mr. F. A. Campbell, director of the college, said he believed the establishment of a plasterers' class would have a very beneficial effect. But any additions to the college buildings should be on permanent lines. It would cost less than £1,000 to erect proper accommodation for the teaching of the three building trades that had been mentioned. An expenditure of £300, with £150 a year for maintenance, would suffice if provision were to be made for teaching plastering only. The Minister said that if he decided to form a plasterers' class it would probably lead to the establishment of bricklayers' and stonemasons' classes also. The Government fully recognised the importance of technical education, as the legislation it intended introducing would show. He wished to grant the request of the deputation, but before he could make a promise he required to know exactly what the cost would be. He asked to be furnished with plans of the proposed new building, and he would consider the matter with a desire to help the plasterers.


PRISONERS' VAN ENTRANCE
STRONG Rm 17' 0" × 10' 0"
WOMENS SICK CELL
WOMENS SEARCHING ROOM 12' 0" × 8' 6"
MENS DRUNK CELL 12' 0" × 9' 0"
CELL
AREA
CORRIDOR TO No 7 WOMENS CELLS
MENS SICK CELL
COALS
YARD
LAMP ROOM 12' × 12'
LAVATORY
W.C.
FOUND AND PRISONERS PROPERTY STORE
CLERKS OFFICE 13' 6" × 30' 6"
CHIEF CLERK 13' 6" × 12' 0"
LIFT
ENQUIRY OFFICE
CHARGE ROOM
PRINCIPAL ENTRANCE
CHIEF CONSTABLE 15' 6" × 12' 0"
CHIEFS RETIRING ROOM
SUPERINTENDENT
INSPECTORS 13' 6" × 12' 0"
SERGEANTS
PRINCIPAL STAIRCASE
LAVATORY
PASSAGE
MEDICAL OFFICERS RETIRING Rm 13' 0" × 17' 0"
MEDICAL OFFICER
PARADE ROOM 87' 6" × 53' 0"
CORRIDOR
POLICE ENTRANCE
PRISONERS ENTRANCE
Building Line
ALFRED GELDER STREET
PARLIAMENT STREET

GROUND-FLOOR PLAN, CITY OF HULL CENTRAL POLICE STATION. JOSEPH H. HIRST, CITY ARCHITECT.

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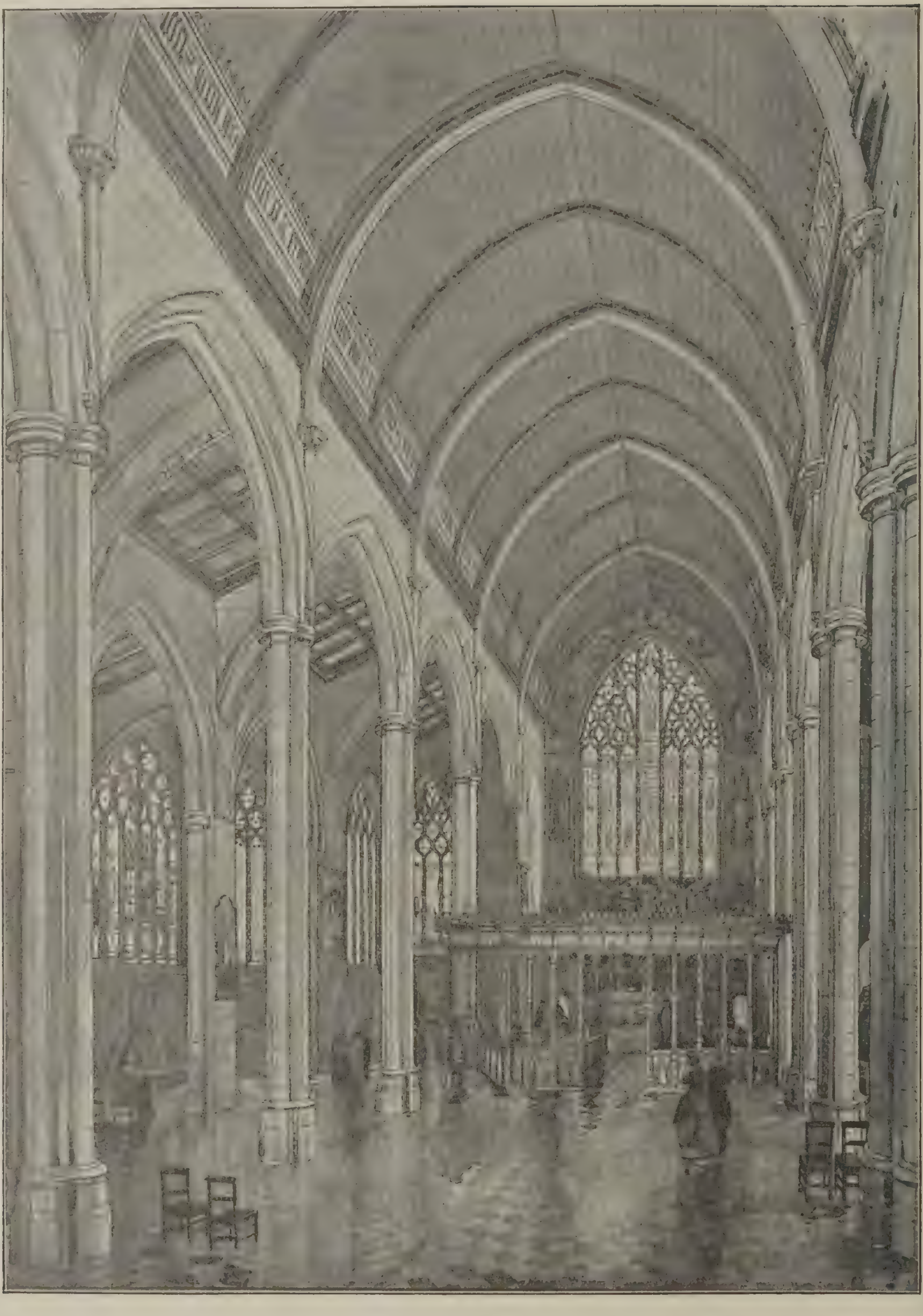
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, September 11th, 1901.



CHURCH TO BE BUILT AT KENSINGTON, S.W. G. F. Bodley, A.R.A., Architect.

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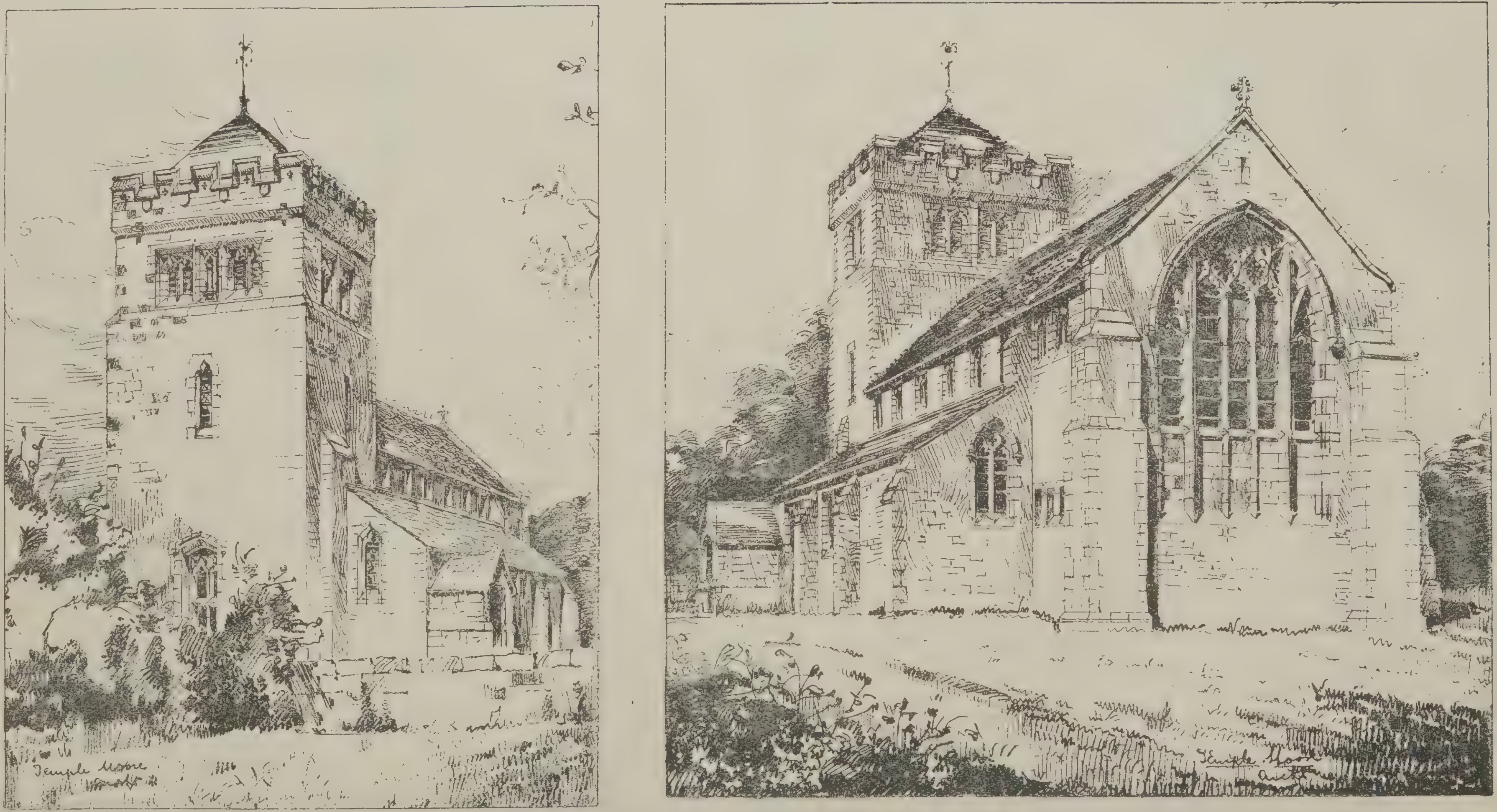
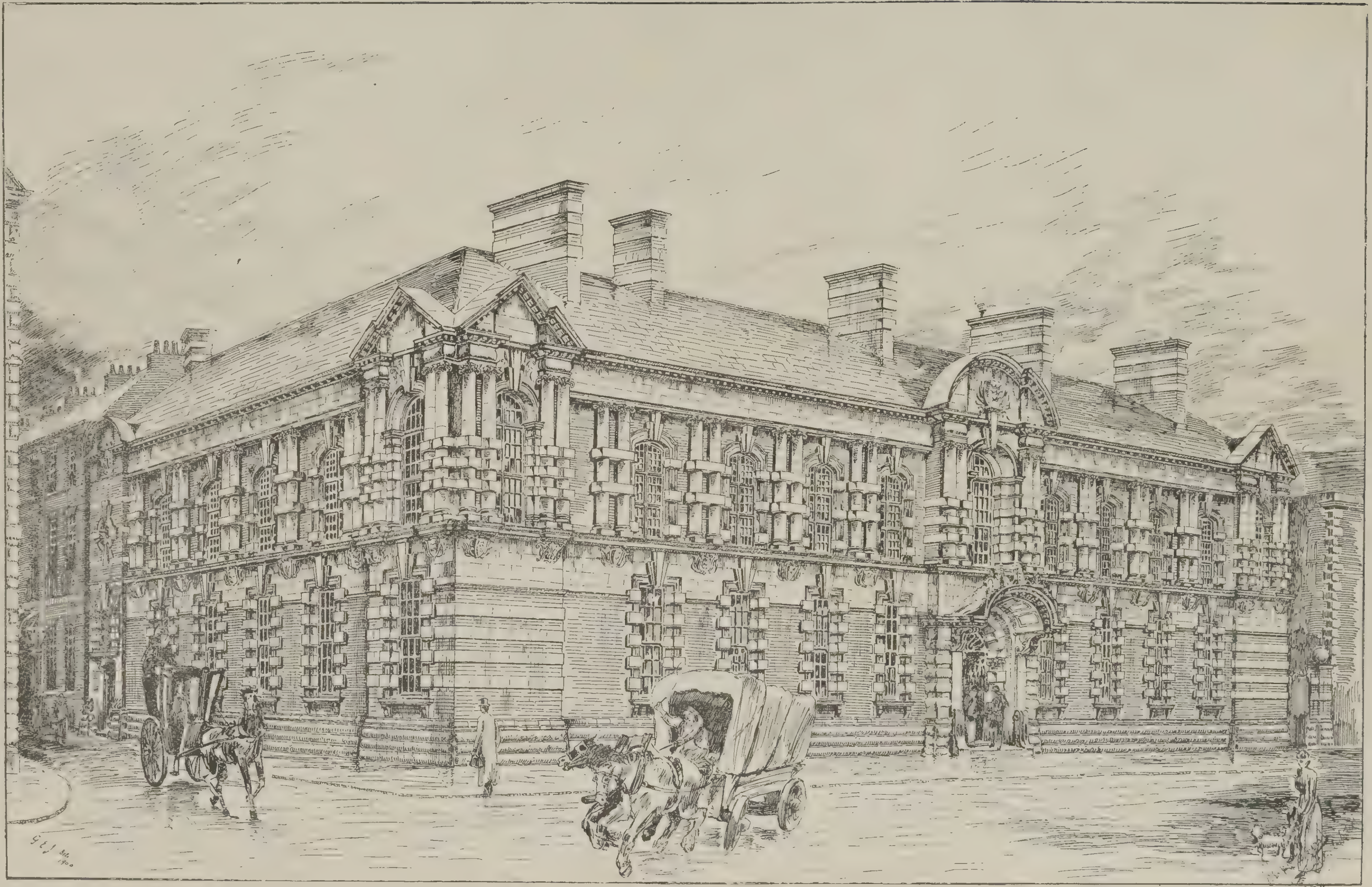
Wednesday, September 11th, 1901.



ST. BOTOLPH'S CHURCH, CARLTON-IN-CLEVELAND, YORKSHIRE. TEMPLE MOORE, Architect.

Supplement to
The Builders' Journal and Architectural Record.
Wednesday, September 11th, 1901.



CITY OF HULL CENTRAL POLICE STATION. Joseph H. Hirst, City Architect.

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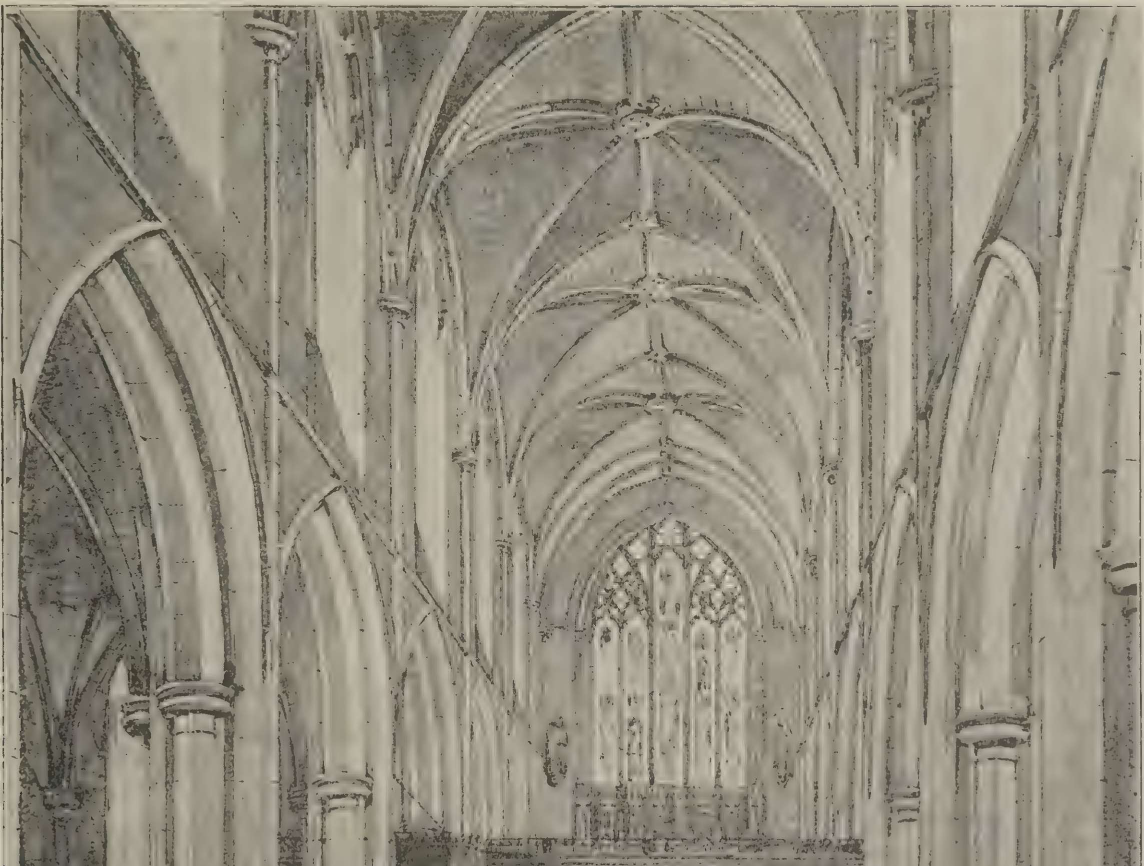

ST. MARY'S CHURCH, ECCLESTON, CHESTER. G. F. Bodley, A.R.A., Architect.

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Masters and Men.

Barry Carpenters' Strike.—The Barry Master-Builders' Association has decided by a unanimous vote to refuse the demand of the carpenters and joiners of the district for an advance of wages of a halfpenny per hour until they are in a position to make a similar advance to the other branches of the building trades in the town. The carpenters' strike in the district has now been on for quite sixteen months.

The Trades Union Congress last week passed the following resolutions: (1) "That this congress expresses its strong admiration at the courage and behaviour of the Bethesda quarrymen during their long and arduous struggle to free themselves from the trammels of serfdom and establish the principles of combination; and, further, this congress emphatically condemns those in authority who are responsible for the drafting of the military and police forces into the district, there being absolutely no grounds for such unwarranted action. And this congress recommends the societies represented here to grant the Bethesda quarrymen a sufficient and regular income so as to enable them to carry on the struggle to a successful issue." (2) "That this congress considers it is imperative in the interests of the building trade workers that inspectors should be appointed for the proper inspection of plant and machinery on buildings in the course of erection or demolition, and regrets that the Government through the Home Office has not seen its way either to adopt the necessary safeguard or to permit of such regulations as will give the present factory inspectors more power and authority for such inspections; further, this congress protests most emphatically against permission being given to employers of labour to work women and young persons overtime, and instructs the Parliamentary Committee to use all legitimate efforts to stop such practices." Mr. Thomas Costigan, secretary to the London Master-Builders' Association, with reference to the statement made by Mr. Edward Browne, counsel to the congress, that it behoved that conference to take into consideration seriously the question whether or not, in view of the extraordinary attack that had been made on trade unionism, the congress should unitedly empower some body to see that there was no principle of law established against trade unionism by attacks on unions which were numerically and financially weak, writes as follows: "'Smashing trade unions' is an old and ever-recurring cry; it has been raised on every occasion when employers have attempted to resist trade union aggression; it is worn threadbare now and has degenerated into a senseless and ludicrous expression, preserved for the benefit of the ignorant and unthinking. If the learned counsel had said 'reasonable defence of their rights and freedom on the part of employers,' instead of 'extraordinary attack that had been made on trade unionism,' and followed it up, he would have been nearer the mark. The unions and trades that are 'numerically and financially weak' run far greater risk of being injured or exterminated by the 'numerically and financially' stronger unions than by any action of the employers, and of this risk eloquent examples are not wanting."

Engineering Notes.

The Borough Technical School, Shrewsbury, has lately been fitted with the latest improved low-pressure hot-water heating apparatus by Messrs. John King, Ltd., engineers, of Liverpool, including their Rahnee radiators.

A Price List for Engineers.—A new edition of "The Engineering Price List" has just been published by Messrs. James Truscott & Son, Suffolk Lane, Cannon Street. The work has now been issued for the past eight years, and is a most valuable volume for all interested in engineering as buyers, sellers or agents. The list gives the name of practically every firm of standing in the trade. A very noticeable feature is the printing in English, French and Spanish of the general index, which shows under the different headings the firms who deal in the particular classes of goods mentioned.

Law Cases.

Preston Royal Infirmary: Unsuccessful Claim against the Architect for Glazing.—At the Preston County Court recently an action which occupied considerable time was one remitted from the High Court, in which Messrs. Helliwell & Co., Ltd., proprietors of a patent glazing establishment at Brighouse, Yorkshire, claimed £56 15s. 5d. from Mr. F. E. Dixon, architect, of Preston, for glazing work done at the new operating theatre at the Royal Infirmary at Preston. Defendant admitted that the sum of £56 15s. 5d. was the contract price; but he did not admit that the amount was due from him to the plaintiffs. The question was whether or not Mr. Dixon was personally liable to the plaintiffs for the amount. Mr. Lawrence (plaintiffs' counsel) said it was mentioned in one of the letters that passed between the parties that Messrs. Walmsley, of Fishergate, were responsible for the glazing. Every one knew that an architect did not put up an operating theatre for his own use but for the use of someone else, but he submitted that whether Messrs. Walmsley or the Infirmary Committee were going to do the glazing work Mr. Dixon made himself liable. Mr. Walter Davies, secretary to the Preston and County of Lancaster Queen Victoria Infirmary, said when he made the affidavit referring to the contract with Messrs. Walmsley, and stated that the glazing was reserved, he believed it to be true. Cross-examined by defendant's counsel, he stated that he subsequently learned the statement in the affidavit was not true, and an interpleader action which had been commenced between Messrs. Helliwell, Messrs. Walmsley, and the Committee was withdrawn. The original contract which was made with Messrs. Walmsley on December 7th, 1899, was for £672 1s. 8d., and included £65 for glazing. For the defence Mr. Dixon was called, who said he was the architect for the new wing at the Infirmary. The contract which was entered into with Messrs. Walmsley was for plumbing, decorating, glazing and electric lighting. Messrs. Walmsley's specification included a prime cost item, viz., the patent glazing—or an item put down in the general contractor's contract which he himself was not able to price. This was a general practice among architects and contractors. Before the contract was entered into with Messrs. Helliwell they knew that there was a main contractor, but they did not know who it was. On March 13th he wrote to Messrs. Helliwell stating that he had certified the amount of their tender to Messrs. Walmsley. The plaintiffs got their instructions from Messrs. Walmsley—in fact, the work was not commenced until Messrs. Walmsley had written them asking them to send over a man to confer with the plumber and joiner. His Honour said that all through the correspondence Mr. Dixon never made reference to the principals; but people must know very well when they were dealing with an architect over a big building like the Infirmary, and eager to do work on that building, they were dealing with him as an agent. They must have known that behind Mr. Dixon there was a responsible body. There was no suggestion that Mr. Dixon had any authority for making the contract. The claim against him was as principal of the contract. The action must, therefore, be dismissed with costs.

A Contract for some Kensington Flats.—Mr. Godfrey Pinkerton has published his award in the matter of the arbitration between John Thomas Hockley, a builder of Grantham (trading as R. Hockley & Son), and the trustees winding up his estate, Messrs. John Simpson (Grantham) and J. T. Medcalf (London), against Henry Metcalf and Thomas R. Greig, trading in co-partnership as architects in London. The dispute arose on a contract entered into by Hockley with Metcalf and Greig to build some large flats known as Iverna Mansions at South Kensington, London, for the sum of £25,762. Hockley did a large amount of work on the contract, but in consequence of the failure on the part of Metcalf and Greig to keep up their payments under the contract Hockley stopped work and ended the contract. Over and above the amount paid on the contract by Metcalf and Greig prior to the stoppage of the works Hockley claimed there was due for work actually executed a large sum of money. It was also claimed that Metcalf and Greig had been guilty of a breach of contract, and that Hockley was entitled to damages from Metcalf and Greig for loss on plant, &c., and of profit on the contract. On the other hand Metcalf and Greig contended that Hockley had been fully paid for all the work he had done, and that he was not justified in stopping the work, and that he had committed a breach of contract; and they claimed over £6,000 damages for their loss in consequence. The arbitrator decided and adjudged (1) that the sum of £2,025 1s. 9d. was due from Metcalf and Greig in respect of work executed by Hockley, the value of which he fixed at £17,169 1s. 9d.; (2) that Metcalf and Greig should pay the sum of £764 for loss incurred by Hockley upon plant and material supplied on the contract; (3) that there was nothing due from Hockley to Metcalf and Greig in respect of damages claimed by them; (4) that Metcalf and Greig should pay the costs of and incidental to the reference and the costs of the award as between party and party; (5) the arbitrator also decided that there had been a breach of contract on the part of Metcalf and Greig, and that Hockley was entitled to the sum of £1,183 for loss of profit on the contract—the total sum under which Hockley would have been entitled to be paid, had he completed it, amounting to £29,000. As regards the last item of the award the arbitrator reserved a point of law, which is to be submitted in the form of a special case to the High Court.

A.A. PRIZE LIST.

THE following is the prize list of the Architectural Association for the session 1900-1901:—

A.A. Travelling Studentship, value £25, *and Bronze Medal*, J. E. Forbes; *Second Prize, value* £5, L. G. Detmar.

A.A. Medal, value £10 10s., G. Drysdale.

Banister Fletcher Bursary, value 25 *guineas*, and *Medal*, T. F. Green; *Hon. Mention*, A. C. Bossom.

Andrew Oliver Prize, value £5 5s., D. Anderson and R. E. Stewardson—equal (prize divided).

Architectural Union Company's Prize. Not awarded.

Essay Prize, G. H. Lovegrove.

LECTURES.

Division I.—E. Gunn, A.A. Scholarship, value £4 4s.; H. E. Rider, prize value £1 1s.; H. F. Tasker. *Division II.*—L. W. Ensor, prize value £2 2s.; H. Greenly, G. Walker.

STUDIO.

Division I.: Construction.—D. W. Stewart, prize value 10s. 6d. *Division II.: Time Sketches.*—C. M. Crickmer, prize value 10s. 6d.

Order of Merit.

LECTURES. DIVISION I.

Greek and Roman Orders.—E. Gunn (book prize), C. J. Goodwin, W. S. Dakers. *Elementary Construction.*—H. E. Rider (book prize), T. L. Dale, E. Gunn. *English Architecture.*—E. Gunn (book prize), T. L. Dale, C. J. Thompson. *Mediæval and Renaissance Architecture.*—F. W. Tasker (book prize), E. Gunn, H. E. Rider. *Elementary Physics, Formulæ and Calculations.*—D. Anderson (book prize), E. Gunn, H. E. Rider. *Plane and Solid Geometry.*—E. G. Allen (book prize), C. J. Goodwin, A. F. Benjamin.

LECTURES. DIVISION II.

Materials, their Nature and Application.—H. Greenly (book prize), W. J. Davies, F. W. Williams. *Construction.*—L. W. Ensor (book prize), P. J. Westwood, G. Walker. *Drainage and Water Supply.*—L. W. Ensor and H. Greenly (book prize); S. Towse and G. Walker; K. D. V. Robinson. *Ventilation, Lighting and Heating.*—L. W. Ensor (book prize), H. Greenly, G. Walker. *Professional Practice.*—L. W. Ensor, W. L. Clarke, G. Walker. *Mensuration, Land Surveying and Levelling.*—L. W. Ensor (book prize), P. R. Smith, N. C. Smith. *Elementary Class of Design.*—Prize value £3 3s. and Bronze Medal, E. G. Theakston; Certificates, H. Hyams and R. E. Stewardson; Certificates, A. E. R. Gill and W. C. Lemaitre. *Advanced Class of Design.*—Prize value £5 5s. and Bronze Medal and Pass for Modelling Class, A. Wingate; Certificate and Bronze Medal and Pass for Modelling Class, A. Durst; Passes for Modelling Class, A. A. Carder and E. Brantwood Muff.

Bricks and Mortar.

APHORISM FOR THE WEEK.

The object and intention of all the Arts is to supply the natural imperfection of things, and often to gratify the mind by realising and embodying what never existed but in the imagination.—SIR JOSHUA REYNOLDS.

Our Plates. ST. MARY'S CHURCH, Eccleston, near Chester, has recently been built from the design of Mr. G. F. Bodley, A.R.A., of Gray's Inn, W.C. It is built entirely of the local red stone inside and out, and the roofs covered with lead. The church was by the munificence of the late Duke of Westminster made complete in every way, the windows being all filled with stained glass, and the furniture in English oak and in marble being all in their places. The fabric is vaulted in stone throughout, and the floor laid with marble and oak. There is a massive tower at the west end. The church is chiefly lit by clearstory windows. The chancel is formed by oak screens richly carved. The reredos rises up to the window, and is of elaborately carved red stone with gilding. The organ is placed over the tower arch, and is of carved and gilded oak-work. There is a rich monument with an effigy of the late Duke, under a canopy. The fabric was built by Mr. Franklin, of Deddington, and the glass was carried out by Messrs. Burlison & Grylls. It is seldom that a modern church is made so comfortable in every respect. The proportions are striking, and the detail throughout has been carefully studied and ably carried out.—The new church at Kensington is to be built in an important position near the Albert Hall. In plan it will consist of nave and aisles and an additional aisle on the one side, an arrangement that suits the site. There will be lofty piers and arches, and stone arches will be thrown both across the nave and the aisles, acting as internal flying buttresses. The chancel will be formed by a high open screen. The nave will be spacious and of considerable height—though none too high for the large buildings which will be near. It is proposed to have the building of stone throughout, while the roof may be eventually painted decoratively. The church has been designed by Mr. G. F. Bodley, A.R.A., of Gray's Inn, W.C. It is hoped that the building may be commenced soon if funds come in.—The question of the provision of a new Central Police Station at Hull has been under consideration for some years. The plans finally adopted propose to utilise the site of the existing police station in Parliament Street with the addition of a commanding corner position at the junction of Alfred Gelder and Parliament Streets. The ground floor plan on p. 70 will show the arrangement. The new building will be in close proximity to the Town Hall and Police Court, and within two minutes of Victoria Square, the centre from which all the electric cars radiate. The public entrance and all the offices are on the Alfred Gelder Street front, while the prisoners' entrance and police departments are in Parliament Street. The work, which is to be commenced immediately upon the removal of the present buildings, will be carried out under the direction of the City architect, Mr. Joseph H. Hirst, M.S.A.—St. Botolph's Church, Carlton-in-Cleveland, of which Mr. Temple Moore is the architect, is designed in the fourteenth-century style, and consists of a nave and chancel under one continuous roof, north and south aisles, west tower and porch. The building is faced both inside and out with local freestone, and accommodates about 250 people at a cost of about £3,000. Mr. Brotton, of Bilsdale, was the contractor. The present church succeeds an old one, which immediately after having been rebuilt some twenty years ago was destroyed by fire, and remained in a state of ruin till about five years since, when the present vicar, the Rev. T. L. Kyle, undertook the building of the new church on the old site. The building, though very simple in detail, is well proportioned and has a dignified effect both externally and internally. A striking feature of the interior is the stone-vaulted gallery under the west tower. The body of the church is divided from the north and south aisles on each side by three wide arches, and there is a handsome five-light east window. The roofs are of oak, and the east ends of the aisles are screened off to form the vestry and organ chamber by simple oak screens.

St. Helens Town Hall Square. THE work of rearranging the property in front of the St. Helens Town Hall and clearing a space of about 4,000 sq. yds. in order to form an open space in front of the Town Hall and Gamble Institute is being pushed on rapidly, and it is expected that by May 1st next year the new buildings fronting the square will be completed and ready for occupation. Messrs. Briggs & Wolstenholme, the architects, have arranged a line of buildings in harmony with the Gamble Institute, which contains the free library and technical schools. The formation of the square at a remarkably low cost has been rendered possible by the munificence of Mr. Walmsley-Cotham and Sir David Gamble, Bart., who have both given valuable spaces, which are to be cleared of buildings. New buildings are to be adapted to the needs of some of the tenants who are being dispossessed by the alterations. The new buildings will be of Ruabon bricks, with terra-cotta dressings. Immediately the disturbed parties are settled in their new premises, Mr. Joseph Ellison, the builder who is carrying out the work, will have the new space cleared and the square finished as rapidly as possible.

A Visit to Hitchin. A VISIT to Hitchin was paid recently by the East Herts Archæological Society, the St. Albans and Herts Archæological Society, and the Hitchin Natural History Society. Mr. H. F. Hatch, of Hitchin, had been chiefly responsible for the arrangements. St. Mary's Church, Bancroft, was first visited, where two papers were read. The first, by Mr. Walter Millard, dealt exclusively with the manner in which the church—which is the largest in Hertfordshire, except St. Albans Cathedral—came to assume its present form. Mr. Millard regarded the date of the oldest part of it to be about the end of the twelfth or the beginning of the thirteenth century, and proceeded to show the respective dates of alterations, additions, &c., in an interesting manner. Mr. T. Geoffry Lucas followed him, and in an exhaustive paper dealt in detail with the whole of the building, exhibiting several plans and drawings to illustrate his remarks. It is specially worthy of note that the church is supposed to possess a genuine Rubens representing the offerings of the Magi. An outside inspection was also made under the guidance of Mr. Millard. "The Biggin" (Norman-French "Béguinage," nunnery) was next visited, and an interesting account was given by Mr. G. Aylott. Up to the time of the suppression of monasteries by Henry VIII. this building was occupied by an English order of nuns known as the Gilbertines. The order was established by St. Gilbert, who was born in the year 1089. In the seventeenth century the building was converted into a school by one Joseph Kent, who left it as an almshouse to the town, for which purpose it is at present used. The Biggin contains eighteen rooms. After this a brief visit was paid to the Cooper's Arms Inn, where the principal object of interest is a fine window dating from early in the sixteenth century, and some observations on the house were made by Mr. Aylott. The party then started for Fairfield, and on the way some of them visited the back premises of The Angel Vaults Inn to see some very ancient woodwork. At Fairfield the large collection of local antiquities possessed by Mr. W. Ransom was seen.

English Stained Glass for Germany. MESSRS. J. POWELL & SONS, of the Whitefriars Glass Works, Tudor Street, E.C., have just completed an order for an east window to be set up in the Immanuelskirche, Frankfurt. The event is probably unique. English windows have before now been placed in English churches abroad, but, so far as we know, never in foreign churches. The window was designed by Mr. J. C. Powell. One reason why the new window was ordered from Messrs. J. Powell & Sons is that the donor favoured decorative work of the mosaic order as against the picture-method of the German artists. The window is a brilliant piece of work, the predominating colour in which is ruby red. There is a great deal of elaborate detail, the design being made up of vine leaves running down the sides of the panels, with the figures in the centre. In principle the work is a reproduction of the old mosaic glass of the thirteenth and fourteenth centuries, but the treatment is modern. The background of the window, which is a five-light, its dimensions being about 15ft. by 12ft., is formed of mother-of-pearl coloured pressed glass, through which the light shimmers gently. The main group represents the Adoration of the Infant Christ by the Magi and the shepherds, with the bright star overhead. Under this is the inscription, "*Got mit uns*" (God with us), and on either side are figures of Christ as the Good Shepherd and the Intercessor. Below are other groups, the principal of which are St. Michael—an angelic figure in armour bruising the serpent, with Adam and Eve in the background—the sacrifice of Isaac, Moses raising aloft the brazen serpent, and Zion rejoicing at the entry of Christ into His Kingdom as prophesied by Zachariah.

Mr. Alfred Waterhouse's Works. MR. ALFRED WATERHOUSE, R.A., who is at present somewhat seriously ill, was born at Liverpool seventy-one years ago, and studied his profession in the neighbouring city of Manchester. Richard Lane was his tutor, with whom he worked for some time, and afterwards travelled in Italy and elsewhere, eventually settling down to practise in "Cottonopolis." His first considerable work was the Manchester Assize Courts, his design for which was the best in a very keen competition. The County Jail, the Owens College, and the Town Hall were all designed by him. At Liverpool he has erected the London and North Western Hotel, the Seamen's Orphanage, the Royal Infirmary, the Turner Memorial Home, and the Royal University College. In London we have his work in the pile of buildings in Whitehall Court known as the National Liberal Club, in the Prudential Company's new offices in Holborn, the Surveyors' Institute, the University College Hospital, and others. Oxford Colleges have been restored to designs by him, and many country mansions built by Mr. Waterhouse. Eaton Hall, Cheshire, the seat of the Dukes of Westminster, was erected by him. He has been made a member of many foreign institutes and societies of fine arts and had diplomas and decorations awarded him. Our own Academy made him an A.R.A. in 1878 and a full member in 1885. He has been President of the Institute of British Architects, whose Gold Medal he holds. He owns about 700 acres in Berkshire, where he likes to be in the summer. His chief recreation is painting with oils or water-colours. He was married over forty years ago.

The Late Mr. Charles Dorman. WE regret to announce the death of Mr. Charles Dorman, senior member of the firm of Messrs. Charles Dorman & Son, architects and surveyors, Abington Street, Northampton, which took place at his residence, 51, Abington Street, last week. Mr. Dorman, who went to Northampton from Uppingham, started business in that town in 1882, and in 1897 he took his own son into partnership with him. Deceased, whose age was sixty-three years, was a very successful architect, and had been connected with the erection of many large and prominent buildings in Northampton, notably Messrs. J. Manfield & Sons' manufactory, Messrs. H. E. Randall's, Ltd., manufactory, Mr. Davis's leather warehouse in Ladies' Lane, Messrs. G. M. Tebbutt & Son's factory in Clare Street, Stimpson Avenue Board School, Military Road Board School, the Free Church in Kettering Road, the Nursing Institute in Barrack Road, and many other works in the county. One of the latest buildings which had been erected under his supervision was the Congregational Church in Abington Avenue, Northampton, which was only opened this year, and the firm is at present engaged on a big factory at Leicester for Messrs. J. Cooper & Sons, of Northampton, which is 300ft. long and 120ft. wide. The deceased also acted as surveyor to the St. Andrew's Hospital, Northampton, and to Holloway's Sanatorium at Virginia Water and to their house at Brighton. Mr. H. C. Dorman, his son, will carry on the business.

A BEAUTIFUL YORKSHIRE CHURCH.

IT is not long since the west front of the cathedral at Peterborough—one of the greatest triumphs of architecture in Europe—was successfully restored and saved thereby from falling into ruin. The abbey of Peterborough was of old one of the most important of the ecclesiastical foundations of England, and, like St. Albans and other great abbeys, it possessed manors, churches and estates all over the country. Among the possessions of the abbey of Peterborough in its early days was Howden, in Yorkshire, fifteen miles south-east of York, where in Saxon times there was a church maintained by the abbot of the parent abbey. As early as the time of the Conqueror Howden passed into the possession of the Bishops of Durham, who had a manor-house there. In 1267 the church was made collegiate, and the rebuilding of the Norman structure was commenced on a grand scale. From that time and through the fourteenth century—the period when Gothic architecture rose to its sublimest height—the rebuilding of Howden was continued. The nave, with its beautiful west front, dates from the end of the thirteenth and beginning of the fourteenth century, when the Early English style was at its full development; the choir was erected when the finest of all the Gothic periods—the Decorated—was in its prime. Bishop Skirlaw built the exquisite chapter-house (1388–1406) and left money for the erection of the central stage of the splendid tower. Later, towards the end of the Gothic period, the Perpendicular belfry stage was added.

Howden church is thus an almost complete example of Gothic architecture for the three centuries during which it flourished in this island, and it is justly celebrated, even in a county so rich in mediæval remains as Yorkshire, as one of the most glorious achievements of the church builders of the Middle Ages. It is one of those heritages of the past the value of which the present has only of comparatively late years recognised. It is to those who wish to preserve what remains of that heritage that the vicar of Howden (the Rev. W. Hutchinson) and his churchwardens appeal to maintain what was once the chief glory of their church, but is now a ruin.

The collegiate establishment of Howden was dissolved by Edward VI., and the confiscation of the prebends diverted funds which should have been devoted to the repair of the fabric into "private hands." The nave and transepts continued to be used as the parish church, but the choir was abandoned early in the seventeenth century; the lead was stripped from its roof in 1634, and the proceeds of its sale presumably fell, as usual, also into "private hands." The vault of the choir, thus deprived of its protection from wind and weather, fell in 1696; in 1750 the vault of the chapter followed. The exquisite work of the finest period of Gothic architecture and a noble example of the later Gothic were thus left bare, and from that time to this little or nothing has been done to counteract the complete destruction which threatens the whole eastern part of the church.

The object of the appeal now made is to preserve the ruins and not to restore them. In 1896 Mr. John Bilson, F.S.A., was asked to report on the condition of the church, and he stated that the choir and chapter-house urgently required attention. They are necessarily much exposed to the weather, and in many parts Mr. Bilson found the masonry suffering severely from the effects of water finding its way into the walls through the open joints—defects which are indicated by the growth of vegetation on the upper parts of the walls. "Repairs," said Mr. Bilson, "are the more necessary here because the east end and the chapter-house justly rank among the finest architectural achievements of their respective periods, and further injury to them would be most disastrous." Some local subscriptions were obtained and repairs undertaken; the turrets of the west front and the south wall of the choir were taken in hand, and all that could be done with the money that was provided was done. But the funds so raised were not sufficient to enable anything to be done to the eastern gable of the choir and the chapter-house. In 1896 some of the tracery fell from one of the chapter-house windows, and last year some more tracery fell from another. For the last ten years vegetation has been flourishing on the apex of the beautiful gable of the east end, and is pushing out the stones of the remarkable gabled finial with which it is crowned. Unless, therefore, repairs are immediately undertaken this beautiful work must soon perish.

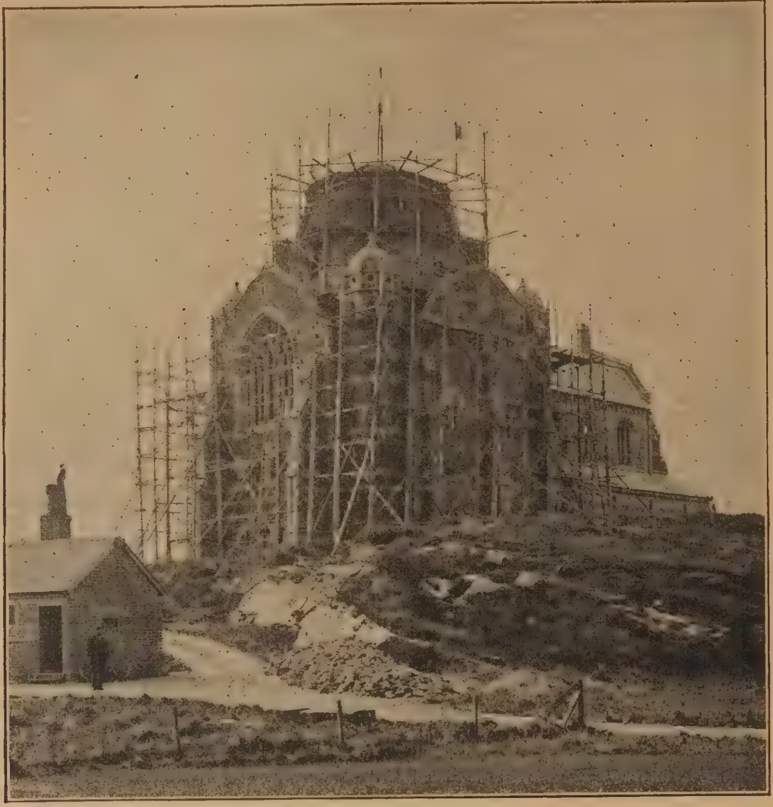
Howden is not a wealthy town, and the church has no funds available for the repair of the fabric. The nave and transepts are maintained by the parishioners, but the repair of the ruined parts of the church is beyond their resources. The sum required to secure the choir and chapter-house from further ruin is only £2,000, and, as stated, the object is to preserve and not to restore. Not a single old stone is to be replaced by new, and no stonework will be inserted except where this is found to be a necessity to secure the stability of the structure. The Society for the Protection of Ancient Buildings has examined what has already been done, and the secretary has written his opinion that the work carried out by Mr. Bilson was done strictly in accordance with the principles of the society. The undertaking for the preservation of the church has the cordial approval of the Archbishop of York and of the East Riding Antiquarian Society, and it is hoped that a generous response to the appeal issued by the vicar will enable the work of repair to be put in hand at once. The vicar of Howden (the Rev. W. Hutchinson), the churchwardens (Messrs. G. H. Anderton and Robert Briggs, of Howden the York City and County Banking Co., and the Yorkshire Banking Co., both of Howden, will receive subscriptions.

BELFAST ROYAL ACADEMICAL INSTITUTION.

THE Royal Academical Institution, Belfast, dates its foundation from 1810. Several additions and alterations have now been made. The house which was until recently occupied by Dr. Sheldon has been converted into a physical laboratory, the special necessity being to get proper accommodation for the science and art work of the school. The new laboratory is nearly 53ft. long, and is situate on the ground floor, the interior walls having been cut out in order to extend the accommodation. The floor has been laid in concrete to a depth of 9in. and finished in cement. Above this there is a layer of tar, surmounted by an oak block floor, the whole giving a rigidity and noiselessness obtainable in no other way. The floor, too, is insulated from the walls, and the instruments which will be used will thus be entirely free from the least vibration, this being absolutely essential to the proper working of this department of the school. The room has been further improved by a number of new windows. In immediate proximity to this room is one of the old English classrooms which has been made into a gallery lecture-room, and the wall opposite the place constructed for the pupils will be left white so as to serve the purpose of a lantern screen. Another of the old English classrooms has been converted into a suite of administrative offices. The new office is much larger than the one which previously existed, and in addition to this is a well-appointed waiting-room for visitors, the principal's apartment and a master's common room. The stairway at the main entrance has been carried to the top of the building, thus bringing into use a great deal of additional accommodation. The old commercial and writing room with some space from the house, has been made into a common hall. In order to take the place of the walls which have been removed from the house formerly occupied by the headmaster steel girders have been thrown across to carry the superimposed weight, these being supported by metal columns. The first floor of the old house is devoted to the English classroom, and the side walls have been pierced with new windows in order to obtain more light. The ceiling of one of the old dormitories has been entirely removed, and six lights have been placed in the roof. This room, which is over 60ft. long, will be used for commercial and art instruction. At the back of the laboratory is placed a stairway carried up to both floors above. The new cloakroom is a spacious apartment, the feature of which is an arrangement for driving hot air from the central furnace underneath the coats and other garments of the pupils, so that on the most rainy day the outer clothing will be completely dry when school is over. The games material room is also a large one; while there is an extensive system of lavatories constructed on the most approved sanitary principles. A covered granolithic playground has been constructed. The contractors, Messrs. M'Laughlin & Harvey, have only been allowed a couple of months in which to carry out this extensive series of alterations, and no effort is being spared to finish the contract in time for the reopening of the school, which is fixed for September 2nd. The architects are Messrs. Blackwood & Jury. A new system of artificial ventilation has been introduced, on the design of Messrs. Davidson, of the Sirocco Works, Belfast. By this contrivance hot air will be driven electrically through ducts, which are carried into every classroom in the building, so that the air can be changed, if required, no fewer than seven times an hour.

THE NEW YORK STOCK EXCHANGE.

BUSINESS on the New York Stock Exchange has grown so rapidly in volume and importance that a new building is to be erected at a cost of 3,000,000 dols. The new building, which is now approaching completion, has its principal elevation to Broad Street and is in the Corinthian style. One of the most worrying considerations connected with the new building in New York has been the construction of a safe deposit vault which should baffle the ingenuity of the American cracksman or tunneller. Amongst other considerations which have had to be taken into account in the construction of the New York Stock Exchange is the climate. Our weather may be eccentric, but such extremes of summer heat and winter cold as New York experiences are unknown here. The winter cold might render the new Exchange an untenable position, having regard to the extraordinary amplitude of its window space, were it not for the special heating arrangements, by means of which warmth will be distributed by steam radiators. Certain mechanical novelties which have been adopted for the sake of convenience and labour-saving seem to be very ingenious. The great windows in the boardroom, for example, will be automatically cleaned, and blinds have been specially invented which can be drawn backward and forward simply by touching electric buttons. In the boardroom there is a "bulletin board" having 1,200 squares, each of which can be rented by a member, who pays for the use of it. The object of the bulletin board is to indicate to each renting member when he is wanted at his office or to meet a visitor in some part of the Stock Exchange building. The specific purpose of the "wanted" notice is shown by an electric lamp illumination of a particular colour of the member's number, which is inscribed in opaque glass. As there are no fewer than five hundred telephones in the New York Stock Exchange, the provision of telephonic facilities has been a very important consideration in the planning of the new building. The great piers have been turned to account in this respect. Despite the large amount of space which the piers take up on the floor, they are turned to such good purpose by the system of encircling telephones that an actual saving of space has been effected, for more telephones have been designed in these positions than would have been possible had the piers been replaced by a simple running wall only thick enough to support the end of the building. The excitement on 'Change during panic periods or following the announcement of great failures has been taken into account in the planning of the building. The boardroom, therefore, has not been located so high as the second storey—which had originally been contemplated—the idea being that in the rush to elevators or stairways in times of great excitement dangerous consequences might ensue. In the basement are hat- and cloak-rooms, a barber's shop, baths, private-rooms, locker-rooms and toilet-rooms. Special accommodation is also provided for the employees, so that, except for business purposes, they need not mingle with the members. Glass has been most extensively used in the new Stock Exchange.



GIGGLESWICK SCHOOL CHAPEL, SETTLE. T. G. JACKSON, R.A., ARCHITECT.

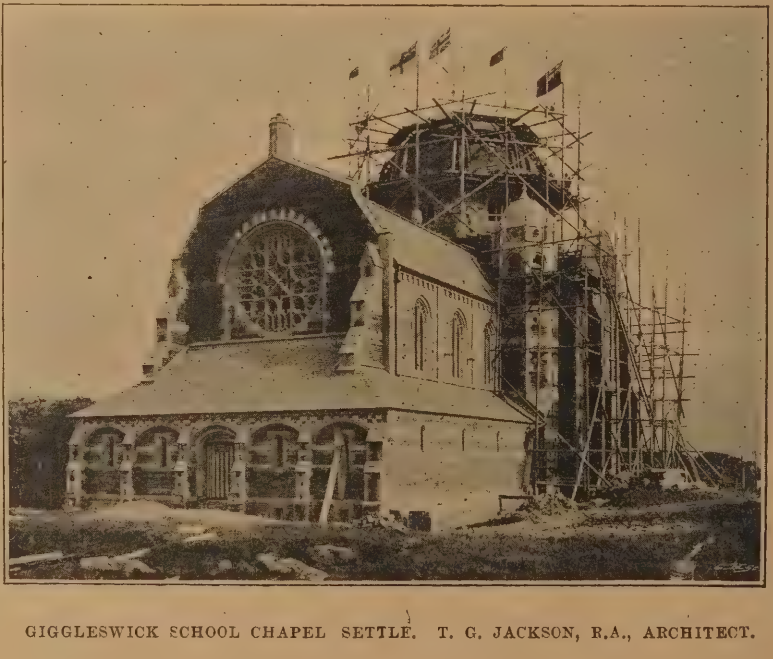
GIGGLESWICK SCHOOL CHAPEL.

ON page 546 of our issue for August 14th last we published some particulars of the new school chapel now being erected at Giggleswick, Settle, from the designs of Mr. T. G. Jackson, R.A. We are now able to give some illustrations of the building, especially of the dome, which has been ingeniously constructed by Messrs. Pulham & Son, of 50, Finsbury Square, E.C., under the direction of the architect and of Mr. Evans, the able clerk of works. The dome has an internal diameter of about 27ft., and is constructed with Messrs. Pulham & Son's patent hard hollow terra-cotta hook-tie blocks, springing from the broad and substantial stone cornice which forms the base or bed. These blocks are raised in courses of 1ft. all round, one course at a time, and well-bedded and connected with cement, the blocks being interlocking and starting in size 2ft. by 1ft. by 6in. wide on bed, then radiating towards the centre and becoming shorter as they rise. They are backed up by a good strong cement-concrete, starting at 15in. thick, well connected and amalgamated with the face blocks, by running the concrete well into the hollow chambers of the terra-cotta courses. The whole is worked up simply by a movable rod and trammel giving the radius and curve from a centre-pivot rod rigidly fixed, the movable rod being shortened to the required length as the size diminishes upwards (see accompanying illustration); the concrete backing follows and breaks joint, the last or apex ring forming the keystone, leaving an opening of 5ft. diameter, on which is fixed the stone lantern weighing several tons, the whole forming an absolutely fireproof monolithic dome. In this way domes of any size can be constructed with perfect safety, provided the foundation and abutment are ample, as in this case, in which the whole building is erected on the rock of the hill on which it stands. The system of construction is not now visible, the soffit of the dome being covered with the mosaic, and the exterior being converted into octagonal plan by brick and cement ribs and stone corbels, carried up in the concrete, backing upon which is fixed the woodwork to give the outer entasis, and to which (in this case) the copper covering is secured. Thus the dome may be constructed without iron and without cumbrous wood or other centering.

Views & Reviews.

Designing Ironwork.

Prof. Henry Adams has recently published a collection of notes, formulæ, calculations and working drawings for built-up steel stanchions as the second part of a series on designing ironwork. The first part of the series was published some time ago and dealt with a steel box-girder. Compilations like these by such an acknowledged authority as Prof. Adams are of considerable value. The study of built-up stanchions is of the greatest importance in the modern system of steel framework construction. In this little book of fifty-one pages Prof. Adams, although he sets out with the intention of designing (as an example) a built-up detached steel stanchion 30ft. high to carry a dead load of 60 tons, happily extends his notes with much information about stanchions in general, strength of iron and steel, foundations, paint for iron, cost of work and fireproof casing. He raises an interesting point when he says: "In the designing of a stanchion, strut, or compression member a difficulty arises which does not occur in designing other parts of structures. We cannot by a single calculation proportion the sectional area to the load by taking a factor of safety upon the ultimate strength; generally the length and load are settled, leaving both the diameter and sectional area to be determined together with the form of cross-section, which latter, again, largely depends upon the relation of the diameter to the sectional area. The difficulty is greater in proportion as the length is increased and the load reduced, but it exists more or less in all cases. We are in this dilemma—that we cannot tell what will be the safe intensity of stress or working load per square inch on the stanchion until we know the ratio of length to diameter, while the diameter depends upon the sectional area requisite to provide for the safe intensity of stress. . . . In the ordinary routine of designing it is a case of 'trial and error,' each trial coming nearer the truth. We can, however, expedite the process by using an approximate formula for safe load per square inch on an assumed diameter until we get near the probable dimensions." The "trial and error" method is most common in engineering practice, though this is considered by the ordinary public to be an exact science. Of course the principles of engineering are those of mechanics, mathematics, physics and chemistry—exact sciences themselves—but in practice it is found not to be expedient to always adopt the theoretical and perfect method, or there may be a want of accurate knowledge in some direction which necessitates that things should be guessed at. Thus the theoretically best section is generally not obtainable commercially, no machines being laid down by the makers to roll it, or else an easy method of making the perfect form has yet to be invented, or more material may be put in than is required because it is easier to make it thus. In this manner engineering is allied to architecture, both being in a sense one and the same, but in the latter of course there come in more unknown quantities than in engineering. Prof. Adams says: "As the hollow cylindrical column is the most economical manner of using cast-iron for supporting high loads so in the built-up stanchions the least material for a given strength will be needed when it is disposed as far as possible from the axis, but on the other hand the demands of modern building construction necessitate the cross-section being kept as compact as possible, and it is therefore a question of holding the balance between these conflicting requirements. Again, the built-up stanchion will be stronger when the circumferential portions are attached to each other to approach



GIGGLESWICK SCHOOL CHAPEL SETTLE. T. G. JACKSON, R.A., ARCHITECT.

the form of the hollow cylindrical column, but this cannot be done in stanchions of small diameter, all that can be done is to connect the various pieces sufficiently by riveting to prevent any possible movement under strain." Mr. Adams discusses Gordon's, Euler's, Johnson's, Merriman's, Rankine's, and other strut formulæ in a very clear manner and draws conclusions as to the best to adopt. The safe loads on foundations are dealt with—a subject too often neglected—and the effects of loads not being axial, of side thrust on stanchions, and of foundations not central, are noted. The question of fireproof casing is a vexed one, and we do not propose to discuss it here, but it is obvious that the iron should be left exposed wherever there is little or no risk of fire, for the logical course is surely to save labour as much as possible and not to hide up the strongest part of the construction, which, if exposed, will give that sense of fitness and strength required to satisfy the eye. Painting ironwork is another objectionable necessity that, it is to be hoped, will shortly be done away with. Of course iron can now be protected by black oxide of iron, but this is not easy or cheap; the alteration of the atomic structure of the outer coating of the iron or the addition of an alloy that will make it resist the atmosphere is the goal to strive for. At the end of this book an American standard specification of structural steel for buildings is included. We would suggest to the author that in the next edition it would be advantageous if the illustrations were printed on a little larger paper, so that when opened they lie clear of the book, as it is distressing when reading a closely argued technical description to have to keep turning back the leaves to look at the illustration. The book is, however, an extremely useful one and should meet with wide appreciation, as far too little is known by the architectural profession about constructional metalwork, in which Prof. Adams is one of the few capable specialists.

"Designing Ironwork. Second Series: Part II.—Notes, formulæ, calculations and working drawings for built-up steel stanchions." By Henry Adams, M.I.C.E., M.I.M.E., F.S.I., Professor of Engineering at the City of London College. Price 2s. 6d. Published by the author at 60, Queen Victoria Street, London, E.C.

THE ENGINEERING CONGRESS.

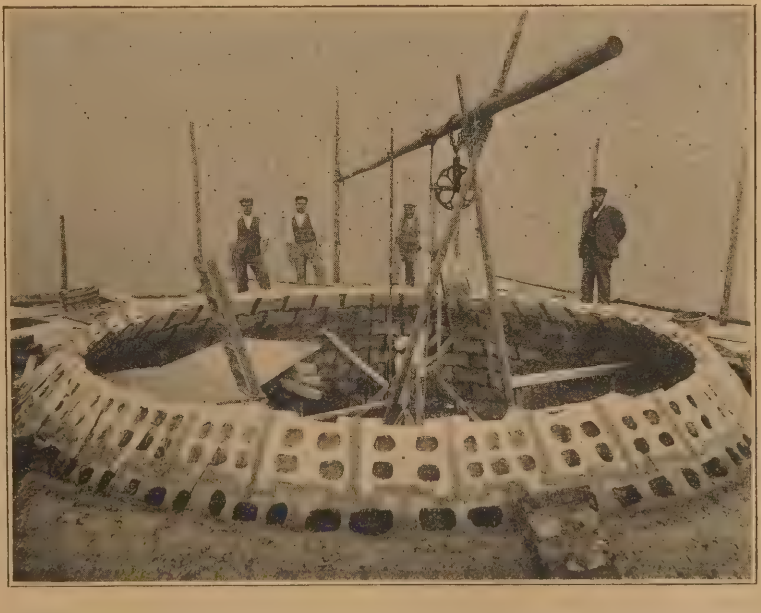
THE International Engineering Congress assembled last week at Glasgow. The honorary president of the Congress was Lord Kelvin, the acting president being Mr. James Mansergh, president of the Institution of Civil Engineers. Mr. J. D. Cormack was general secretary. The Congress was divided into no fewer than nine sections, as follow:—(1) Railways—chairman, Sir Benjamin Baker; (2) Waterways and Maritime Works—chairman, Sir John Wolfe-Barry; (3) Mechanical—chairman, Mr. W. H. Maw, president of the Institution of Mechanical Engineers; (4) Naval Architecture and Marine Engineering—chairman, the Earl of Glasgow, president of the Institution of Naval Architects; (5) Iron and Steel—chairman, Mr. William Whitwell, president of the Iron and Steel Institute; (6) Mining—chairman, Mr. James S. Dixon, president of the Mining Institute of Scotland; (7) Municipal—chairman, Mr. E. George Mawbey, president of the Incorporated Association of Municipal and County Engineers; (8) Gas—chairman, Mr. George Livesey; (9) Electrical—chairman, Mr. W. E. Langdon.

At the opening on Tuesday Mr. Mansergh delivered a short address, in which he said that engineers constituted more than a profession; they amounted to a "race"; and it was upon them more than upon any other class of the civil population of the world that fell the heaviest share of the "white man's burden." The quality of the engineer seemed to lean more to the side of invention than to that of scholarship. For his part he was content to have it so. Not that an engineer could ever be too deeply instructed or too well trained in the elements of knowledge and skill required for the effective pursuit of his calling; but the really great engineer was born, not made. Engineering was the only high art which depended as much on its cheapness for its excellence as upon any other item in the sum of achievement. All other things being equal—adaptability, soundness, efficiency—the engineering work which costs the least money was the best. The "cash" basis was the real foundation upon which the engineer builds, and this consideration drew them at once from judging engineering as merely something cleverly done by an ingenious person. It also very often served to distinguish between college, text-book, or rule-of-thumb engineering and the real thing. A good deal of wasted ingenuity would be saved if those who engaged in every kind of engineering work would remember to use the money standard as well as the foot-rule and the higher mathematics. Real engineering must be mastered as it was realised on works in progress. It had no authoritative text-book. Like the perfect artist described by Longfellow, the engineer must learn to work with the means that lay readiest to his hand. He must cherish his ideals or he would sink into the routineer; but he, of all men, could not afford to indulge in hobby-riding. The distinguishing note of modern engineering was that it subserved in the main the interests of the mass of the people.

VIEW OF INTERIOR OF DOME, GIGGLESWICK SCHOOL CHAPEL, SETTLE.

From the many papers read in the various sections, we may select the following:—

In the Municipal section Lieut.-Col. Alfred S. Jones, C.E., V.C., read a paper on "Practice with Science in the treatment of Sewage." He insisted upon good arrangements for dealing with sludge and screenings. Barging to the sea or pressing with lime into a portable cake of little or no manurial value were sometimes resorted to for sludge, and a destructor fire, he said, was best for screened rags and other débris. Mr. William Weaver, borough engineer and surveyor, Kensington, in submitting a paper on "Municipal Sanitation" said wherever practicable the surface water should be received into a separate system of sewers in order to divert the water from the sewage outfall. In ventilating sewers simple methods were preferable to complicated and costly systems of combustion or chemical aëration. If sewers and drains were treated as component parts of one system, and each drain made to assist in getting rid of the smell it helped to create, road-surface ventilators would not be necessary, and the costly comparative merits of the various patent systems for dealing with sewer air would no longer require attention. House-drainage, as far as was consistent with efficiency, should be made as simple as possible. On the subject of habitations and their occupants Mr. Weaver said that the increased cost of building principally arose from the modern trade union policy of limitation of output governing all the material and trades connected with the structure. The result was thus brought about that by the curtailment of their efforts workmen were making their handiwork too expensive for their own enjoyment. One of the great defects in sanitary administration



THE CONSTRUCTION OF THE DOME, GIGGLESWICK SCHOOL CHAPEL, SETTLE.

arose from inability to enforce cleanly and sanitary habits on the occupier. Sanitary nuisances, whether arising from man or matter, should be dealt with, and the present limitation of sanitary effort to matter only should be revised. No nuisance should be allowed to stalk about in freedom and multiply broadcast because it happened to be in human form. Mr. A. H. Campbell, engineer and surveyor of the East Ham Council, in a paper on "The Housing of the Working Classes, with Special Reference to Suburban Districts," described the scheme of the East Ham Council for providing within their district dwellings of suitable class and at a suitable rental for the lowest class of wage-earners, whose earnings were at maximum 30s. a week. The scheme of the council was to provide four-roomed and five-roomed houses of from 470 to 520 super. ft. on the ground- and first-floors respectively at rentals of 5s. 9d. and 6s. 3d. per week inclusive. It had been found at the East Ham dwellings that for each 100ft. of available floor-space in rooms a rental of from 1s. 4d. to 1s. 7d. per week was required.

In the Iron and Steel section Mr. J. E. Stead gave the results of investigations upon alloys of copper and iron. He observed, amongst other things, that copper in cast iron does not appear to have any influence in retaining the carbon in the combined form or in causing a separation of graphite, and that copper in foundry iron neared not be feared, as its only effect appears to be that of raising its tenacity. A paper was also contributed by Mr. J. E. Stead and Mr. F. H. Wigham, who stated that, although their researches were far from conclusive, they led them to conclude that copper in high carbon steel for wire-drawing purposes should be avoided.

In the Mechanical section Mr. R. Lenke read a paper on "Some Experiences and Results Derived from the Use of highly superheated Steam in Engines." He said the steam engine in its highest perfection attainable at present could not claim the first place in comparison with other heat engines. Superheated steam was a very bad conductor of heat, and had the special peculiarity of being able to lose a certain amount of heat without becoming either saturated or wet steam. The economy effected by using superheated steam in engines was very remarkable. To obtain the full benefit, the required temperature of steam was 660degs. to 700degs. F., and to stand this temperature the engines must be specially designed.

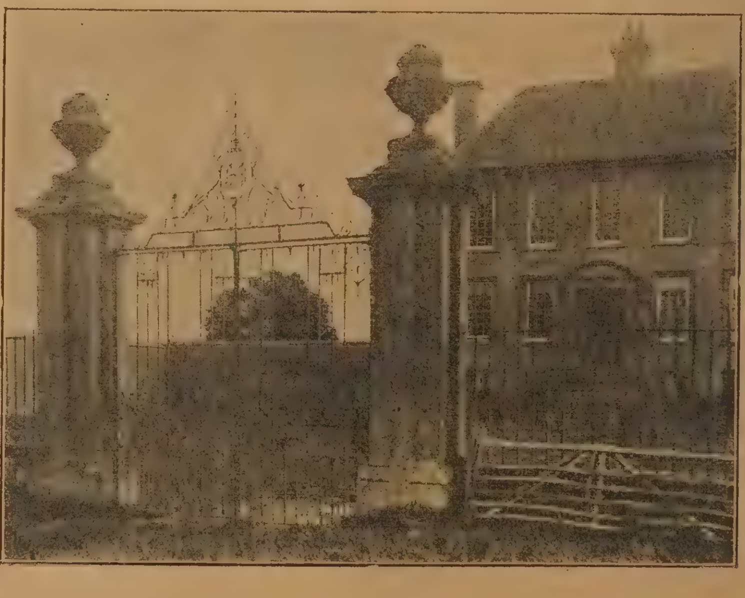
The Old Church of St. Peter Mancroft, Norwich, is again in need of reparation. Despite the large sums which have been spent on it during recent years, the north and south walls and porches are said to be in such a state of decay that large masses of masonry have fallen out, while the east end is also in need of renovation. So serious are the dilapidations that it is estimated that some £4,000 will be required to put the building in proper repair. At present, however, it is only contemplated to spend about £500 on the works most urgently needed.

LOWER LYPIATT.

BY GEORGE TROTMAN.

LOWER LYPIATT is a fine old house—now alas! fast falling into decay—situated about four miles from Stroud, and overlooking one of the numerous delightful valleys in that neighbourhood. There is a record, I believe, of a mansion being there in the reign of Queen Elizabeth, but becoming ruinous it was rebuilt at the end of the seventeenth century by one Judge Charles Coxe, member of Parliament for the borough of Cirencester. From what remains of the entrance gates it is seen that at one time they must have been very fine. They are said to have been designed and executed by a reprieved sheep-stealer out of gratitude to the judge who obtained his reprieve—at least this is the story. The gardens appear to have been laid out with good taste, and covered the slope into the valley below. On this slope is a monument erected to the memory of a favourite horse. The tablet with inscription has been lost.

LOWER LYPIATT, NEAR STROUD.



LOWER LYPIATT, NEAR STROUD: ENTRANCE GATES.

St. Barnabas Church, Burnmoor, is to have a new altar as a memorial to Queen Victoria. The memorial altar is of carved oak, with three panels in front, the centre bearing a floriated cross, and the ornamentation includes the customary emblems of corn and grapes. It is proposed to leave the panels uncovered, but super-frontals in the colours of the ecclesiastical seasons will be provided, and are being worked at the school of embroidery in connection with Canon Body's Society of Workers at Durham.

SOME IRISH BRICKWORKS.

THE manufacture of bricks and tiles in Ireland has been in a fairly flourishing condition, though not nearly so flourishing as might reasonably be expected; but as regards pottery the industry has not yet attained anything like anticipations.

One of the largest—if not the largest—firm in Ireland utilising the red clay for terra-cotta work and facing bricks is

The Annadale Brick Co., of Belfast,

whose works are situated about a mile and a half outside the city, at the end of the Ormeau road. These works stand in about fifty acres of clay soil owned by the company, the portion not immediately occupied by the works, kilns, sheds, &c., being farmed to supply goods for the company's horses. The kiln is a circular one of the "Hoffman" type and has twenty-four chambers with a holding capacity of 500,000 bricks. The works are contiguous to the kiln, and comprise two floors of machinery and drying-rooms. The ground floor is devoted to brick-making. One section of the brick department contains a Wooton's improved pug (with three sets of rollers) having a capacity of 25,000 to 30,000 bricks a day, as well as another machine of similar capacity. A different section of the works is employed turning out pressed facing bricks, and in this case the clay is washed first and then put through machinery. The drying sheds are heated by steam and run the whole length of the building. The works can turn out 50,000 to 60,000 bricks daily. The pottery and terra-cotta department has the end of the building to itself; and this branch of manufacture, though only started a few years, has now developed into a very large business. The Annadale Brick Co. was the first firm to introduce terra-cotta and ornamental bricks into Belfast. The works are continually being extended. Originally the company's trade was chiefly confined to Belfast and the Northern counties; but now the firm send bricks all over Ireland, and are cultivating an export trade, particularly in terra-cotta.

The Works of the Skeigoniel Brick Co., Ltd.,

are situated at Skeigoniel, on the outskirts of Belfast, and cover an area of ten acres of land. The company is a private one, the shares being held by the families of Sir Daniel Dixon (Lord Mayor of Belfast) and of Mr. James Campbell. They manufacture only compressed bricks, which are well known throughout the North of Ireland. The works have an output of from 7,000,000 to 9,000,000 bricks per annum.

Other Brickworks around Belfast.

Messrs. S. M'Gladery & Son, brick and tile manufacturers, Springfield Road, Belfast, are makers of common machine-made bricks. The brick-making industry in Belfast has been seriously affected by the depression in the building trade. About five years ago this firm had five brick machines at work, employing 250 workmen, and were capable of turning out over 100,000 bricks per day, but at present they do not employ more than one-fourth of the number of men mentioned.

The brickworks situated at Brookmount, near Lisburn, were established by James Simpson in 1893. The grounds consist of a bed of pure red clay about 12ft. thick just below the soil, free from stones and very rich; also a hill of red sandstone 20ft. thick above the level of the surrounding country. This sandstone is ground in a revolving 9ft. dry pan, and thoroughly mixed with the clay in proper proportions, thus making a hard sound cherry-red brick free from cracks. There is a first-class stock brick made here, and also facing bricks, pressed, perforated or shaped. Very few tiles are made, there being no demand for them in that neighbourhood. The bricks are dried on benches in summer, covered with ordinary thatched hacks. Bars are used in the furnaces, best Scotch coal being used for firing. It takes six days to water, smoke and burn, twelve hours to settle, and twenty-four hours to cool off. The trade at present is unfortunately very dull in the neighbourhood.

The Kingscourt Brick and Terra-Cotta Works, which are situated at Kingscourt, in the co. Cavan, supply all the War Office contracts in Ireland with facing bricks, coping, ridge tiles and ventilators. They supply Portobello Barracks, Island Bridge Barracks, the Royal Barracks, the Richmond Barracks and Arbour Hill Barracks, and the articles manufactured there are also sent on to Athlone, Mullingar and elsewhere. The works have been in existence for about twenty-five years. Formerly bricks only were manufactured at the works. Recently the manufacture of ornamental terra-cotta, ridge tiles, &c., has been added, and the manufacture of blue bricks is about to be started. This is the first experiment made in Ireland in the production of blue bricks, which take twice as long to burn as the ordinary brick. From sixty to seventy men are permanently employed at the Kingscourt works, almost all of them being local hands.

In the south there are a number of important firms doing a good trade in the manufacture of bricks and tiles. They include Richard Farrell, of Youghal; the Youghal Brick Co., Ltd., of Youghal; the Cork Brick Manufacturing Co., Ltd.; the Charleville Brick and Tile Co., Charleville; William Carroll, Cork (brickworks at Douglas); and John Barry, Cork.

The brick factory of the Waterford Brick Co., at Waterford, has been at work for about two years. The bricks are made of crushed stone, in the semi-plastic process, and are burnt in a patent Belgian continuous kiln of twenty-four chambers. The weekly output is between 40,000 and 50,000, and the demand is so great that the bricks are sometimes taken hot from the kiln and loaded on cars.

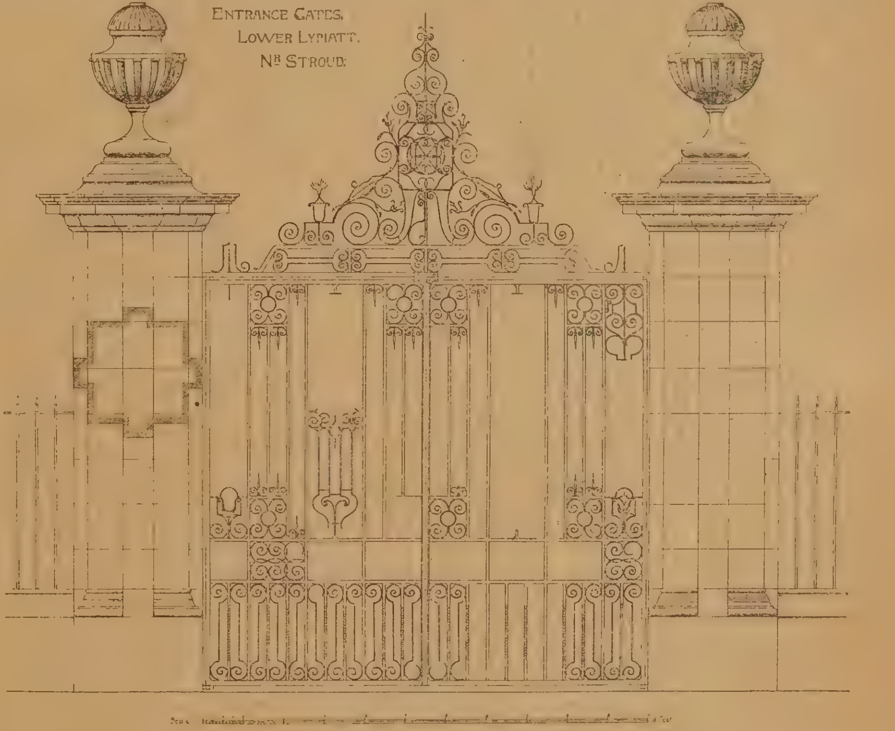
In the vicinity of Dublin there are a few manufacturing firms doing a large business, and Messrs. Flood are brick and lime manufacturers in Clondalkin. The Dublin Brick and Tile Co., Ltd., have their extensive works at Mount Argus, Harold's Cross, and their office is in Beresford Place. Owing to the stony nature of the clay from which the bricks are manufactured, it is necessary to wash it to produce a good brick, and to this may be attributed the large demand there always is for the company's goods, the output amounting to over six million bricks per annum. All the machinery, kilns, &c., have been specially designed by their manager to suit the material from which they manufacture. The waste heat from kilns, &c., and the exhaust steam from the engines are utilised for drying the green bricks, which are made on the plastic wire-cut system. The company have a black stone quarry in operation. The stone is largely used for building and other purposes, and they supplement their washed clay by dry grinding a shale that lies between the beds of stone. The company employs about 100 hands.

On the Crumlin Road, Crumlin, are situated the works of the Dolphin's Barn Brick and Tile Co., Ltd.

At the Belvelly Brick and Tile Works, Fota Island, Queenstown, which, we understand, are kept going by the Right Hon. A. H. Smith-Barry, M.P., for the laudable purpose of employing local labour, the annual output of bricks is 800,000, of which 100,000 are pressed facing bricks and 700,000 ordinary building bricks, a quantity of flooring tiles being also produced to meet the demand. There is a working staff of twenty-two men, with horses when required. The annual outlay on labour, &c., amounts to £900. Owing to slackness of trade there is at present a large quantity of bricks in stock. As no profits are sought, quotations are given at cost prices. The plant consists of one 8-h.p. semi-portable engine, one pair of rollers for crushing clay, one vertical mill and side delivery cutting-table, and a six-chamber baker kiln to contain 100,000 bricks.—(Extracts from an article in the "Irish Independent.")

NEW BATHS AT OLDHAM.

NEW baths situated at Robin Hill, on the north side of the town, were formerly opened at Oldham last week, the cost being £10,000. Similar baths will shortly be opened at Rathershaw, on the south side of the borough, and in addition another such building is in course of erection in Glodwick. The Robin Hill Baths are erected at the corner of Dunbar and Trafalgar Streets, and are set back from the street with boundary walls and ornamental gate and railing in front. Separate entrance is arranged for each bath from Dunbar Street, with ticket office within, and near the respective entrances are two waiting-rooms, one for each sex. The swimming hall is 94ft. by 47ft. 6in., the swimming pond 75ft. by 27ft., 6ft. 6in. deep at one end and 3ft. 6in. at the other, there being arranged round three sides fifty-seven dressing-boxes, the divisions between them being of polished marble. There are two wash-baths, also showers for bathers to use before entering the pond. The sides of the pond are faced with white glazed bricks up to the water-line; from this point to underside of coping is an effective treatment of tiling in pale green and cream, the bottom being tiled with white tiles relieved with bands of black. A balcony is carried round the four sides of the hall, with gentlemen's private baths arranged down two sides, one side containing thirteen first-class baths (including one vapour-bath), the other twelve second-class baths. The ladies' private baths are on the first floor over the ticket office, waiting-rooms, &c., there being four first-class (including one vapour bath) and seven second-class, also attendant's store-room. All first-class baths throughout have showers. The supply of hot and cold water to all private baths is regulated by means of valves worked by the attendant from corridors. A laundry, superintendent's house, mechanic's shop, store-rooms and spacious cellars are also provided. The whole of the work has been carried out from the designs and under the superintendence of Mr. Charles T. Taylor, A.R.I.B.A., architect, of 10, Clegg Street, Oldham.



MEASURED AND DRAWN BY GEORGE TROTMAN.

New Patents.

These patents are open to opposition until October 14th.

1900.—Cement Manufacture.—14,278. Dr. HERMANN PASSOW, 11, Posthof, Hamburg. The raw material (ground or rough) is melted down till a liquid homogeneous mass is formed. Oxygen (or air or gas containing oxygen) is then brought into intimate contact with it, so that a cement clinker is obtained. It is claimed that the quantity of air or oxygen can be regulated, and that blast-furnace cinders can be changed, without further chemical additions, into cement equal in all respects to the best Portland cement.

Timber Waggons.—15,769. J. A. HOLDSWORTH, 37, Park Avenue; F. C. MIDGLEY, 47, Louis Street; and J. HOLDSWORTH, 27, John Street—all of Hull. The body of the vehicle is wedge-shaped, the front forming the apex. The load is placed on a tail-board gate, and when this is lowered the timber is discharged with ease.

The following specifications were published on Saturday last, and are open to opposition until October 21st. The name in italic is that of the communicator of the invention. A summary of the more important of them will be given next week.

1900.—14,411, JONES, ball valve. 14,496, COOK, guards for woodworking machines. 14,526 ALDEN, sliding doors, sashes, &c. 15,186, BROPHY, apparatus for supplying hot and cold water in bathrooms, &c. 16,037, ADAMS, apparatus for spraying sewage upon a filter bed. 17,086, DEUTSCH, cranes or hoists. 17,374, BOND, trap for drains, sewers, &c. 17,477, TENOW & FLODSTRÖM, lumber-piling machines. 17,866, ELIET, construction of floors, girders, joists, &c., from trussed beton. 17,867, ELIET, construction of flooring, walls, partitions, &c., of trussed beton. 18,213, HERMAN, street manhole covers. 18,443, SHIMER, cutter heads for woodworking machinery. 18,565, THOMSON, regulating the supply of hot and cold water to baths, &c. 19,392, MÜLLER, manufacture of cement.

1901.—4,688, MALLETT, cowls. 5,433, LINDEMANN, trucks for transporting bricks. 9,184, WEISS, parallel-motion valve-regulator for ventilating apertures, heating flues, &c. 11,927, LAKE (*Giussani*), preservation of wood. 12,745, WOODHOUSE, syphon flushing cisterns. 13,237, NEUHAUS, manufacture of cement pipes with imbedded iron meshwork.

Enquiries Answered.

The services of a large staff of experts are a the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases le addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Strength of Cast-Iron Stanchion.

NORTHAMPTON.—BRUIN writes: "I should be glad if Prof. Henry Adams would state a formula for ascertaining the strength of cast-iron stanchions of H and ⊢H sections. I have consulted several authorities without success. The particular case I have in mind is one where a stanchion of ⊢H section 10ft. 6in. long, to carry 25 tons, is needed. I want to ascertain its sectional area. It will be used in an old building which is about to be turned into shops?"

Full particulars of designing cast-iron stanchions are given at p. 138 of "The Practical Designing of Structural Ironwork" (E. & F. N. Spon, 125, Strand; 8s. 6d.). A 7 by 7 by ¾ I stanchion of cast-iron 10ft. 6in. long will carry 25 tons safely. By Gordon's formula:—

$$W = \frac{f\,A}{1 + \frac{3}{400}\left(\frac{l}{d}\right)^2}$$

where W = breaking weight in tons; f = compressive strength in sq. in.; A = area of section in sq. in.; l = length in inches; d = least breadth in inches.

For 7 by 7 by ¾, A = 14¾ sq. in.; f for cast-iron = 36; l for given case = 10½ × 12 = 126in.; d for proposed section = 7in.

$$\text{Then}\quad \frac{36 + 14\frac{3}{4}}{1 + \frac{3}{400}\left(\frac{10\frac{1}{4} \times 12}{7}\right)^2} = 154{\cdot}8 \text{ tons};$$

and with factor of safety 6, $\frac{154{\cdot}8}{6} = 25{\cdot}8$ tons safe load.

HENRY ADAMS.

Makers of Artificial Stones and Concrete Pavings.

BRADFORD.—W. H. & Co. write: "Kindly give the names of artificial pavement makers, concrete flags, &c."

You will find the names of many makers of artificial stones and concrete pavings in Laxton's "Price-Book for Architects, Builders, Engineers and Contractors." The following are some of them: Metallic Paving and Artificial Stone Co., Ltd., 86, Strand, W.C.; Patent Victoria Stone Co., Ltd., 10-13, Hamilton House, Bishopsgate Street Without, E.C.; W. B. Wilkinson & Co., Ltd., 15, Great George Street, Westminster; Stuart's Patent Granolithic Stone Co., Ltd., Regent's Dock, Limehouse, E.; Hobman & Co., Stockholm Road, Cliftonville, South Bermondsey, S.E.; Patent Indurated Stone Co., Ltd., Millwall, E.; B. Ward & Co., 15, Great George Street, Westminster.

Reed Thatchers.

LYTHAM.—E. C. P. writes: "I am about to build some small portable wooden bungalows, and I purpose covering the roof with Norfolk reed thatching. At present, however, I have been unable to obtain the names of any persons who would undertake this work. Could you name anyone?"

It is becoming increasingly difficult to get thatching executed, even in the districts where a few years ago its use was almost universal. Possibly an advertisement in a local paper would procure what you need. Try the "Dereham Times" (address, East Dereham, Norfolk) or the "Norfolk Chronicle" (address, Norwich). Should this be unsuccessful I would suggest the "Cambridgeshire Times" (address, March, Cambs.) or the "Huntingdon Advertiser" (address, March). All the above are weekly papers.

G. S. M.

Stress Diagram for Roof Truss.

BRIGHTON.—D. writes: "I send a diagram of a roof for a small hall. What would be the reciprocal diagram? The dead loads on one side are figured with the total weight on walls."

The span of roof is not given, but it is assumed to be about 27ft. The exact stresses would be rather troublesome to work out, but the case may be very much simplified and approximate stresses obtained by taking a vertical load of 56lb. per ft. super., to include wind, snow, structural load, &c., and assuming the frame diagram to be as in Fig. 2, when the stress diagram will be as Fig. 3.

HENRY ADAMS.

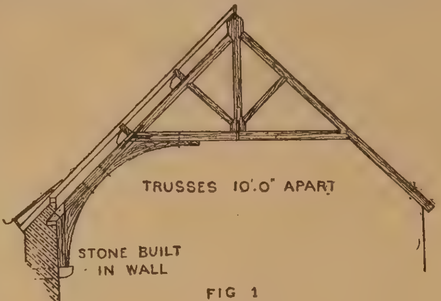


FIG 1

GIVEN DESIGN

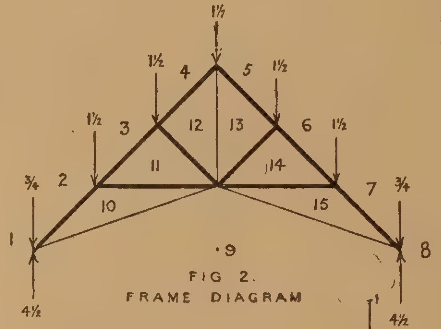


FIG 2.
FRAME DIAGRAM

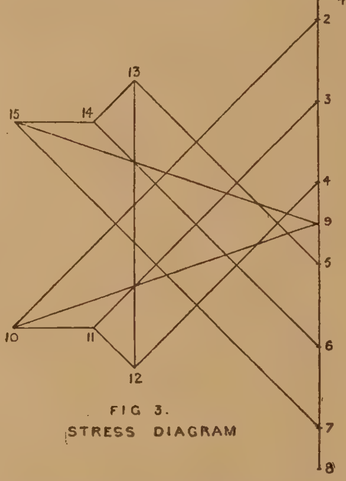


FIG 3.
STRESS DIAGRAM

DIAGRAMS FOR ROOF TRUSS.

Taking-Off Quantities from Plans.

STAFFS.—G. H. writes: Which is the best and most correct way of taking-off quantities from plans of roof-timbers, especially where the roof has many hips, valleys, dormers, &c.?"

This query is of rather too comprehensive a nature, and is not sufficiently defined, to enable us to reply within the limits of these columns. If "G. H." will mention an instance showing where he is in difficulty, we will endeavour to help him; or he will find examples to help him in the various works on the subject. As an elementary work we would refer him to "Quantities and Quantity-Taking," by W. E. Davis, price 3s. 6d.

Erecting a Casting Shop.

BLOXWICH.—W. W. writes: "Kindly name a book dealing with the construction of furnaces and stacks in casting shops. I have to provide a plan for a casting shop with six furnaces, all the flues to run into one stack. I may say that I have not had any experience of this kind of work before."

We do not know of a book dealing particularly with the planning and construction of casting shops. We can only advise you to consult recent books and papers dealing with the latest practice in moulding and founding, and make your design conform with the necessary requirements. Get full particulars from your clients of their particular workshop methods. The following books contain much useful information on the subject: "The Metallurgy of Iron," by Thomas Turner (Griffin & Co.); "The Metallurgy of Steel," by F. W. Harbord (Griffin & Co.); "Iron and Steel Manufacture," by Arthur H. Hiorns (Macmillan & Co.); "The Management of Steel," by George Ede (E. & F. N. Spon, Ltd.); "Pipe Founding," by James W. Macfarlane (E. & F. N. Spon, Ltd.); "A Treatise on Iron and Steel Founding," by Claude Wylie (E. & F. N. Spon, Ltd.); "Brass Founding," by James Larkin (E. & F. N. Spon, Ltd.). Perhaps the most useful books are "A Practical Treatise on Casting and Founding, including descriptions of the Modern Machinery employed in the Art," by R. E. Spretson; and "The Metallurgy of Cast Iron, being a complete exposition of the processes involved in its Treatment, from the Blast Furnace through the Foundry to the Testing Machine," by Thomas D. West (12s. 6d.). These are both published by E. & F. N. Spon, Ltd., of 125, Strand, W.C. For the latest practice in founding see the Proceedings of the Iron and Steel Institute.

Architects in India.

LONDON, W.—BEGINNER writes: "Is a clerk likely to gain employment in India as an architect, and is the salary good?"

We think anyone might have refrained from asking us such a ridiculous question as this. By "clerk" we presume our correspondent means clerk of works. India is as well supplied with architects as this country, except perhaps its European ones are not so capable as those here; the native architects, however, are very skilful, and build in the most suitable way. The constructional work that is mostly done in India is in the hands of engineers, and a clerk of works there would have less chance of obtaining a remunerative practice quickly than in this country.

The Planning of Hotels.

DRAUGHTSMAN writes: "Can you name a book giving information about the planning and construction of hotels?"

We know of no book dealing exclusively with this subject. Mr. Percy L. Mark's "Principles of Planning" gives a list of the requirements and plans of an hotel.

Openings for Architects in Japan.

BURNLEY.—G. A. B. writes: "Are there Government or society examinations in surveying, levelling, &c.? Also are there openings in Japan for architects or surveyors, and where can I obtain particulars?"

Government examinations are held for assistant surveyors in the Civil Service. The Surveyors' Institution holds examinations in surveying, and particulars can be obtained from the secretary, Surveyors' Institution, Great George Street Westminster, S.W. Japan has plenty of native architects, but we believe several American architects have taken advantage of the craving for European civilisation and have good practices among the wealthy classes there; but the boom may be only an ephemeral one. Civil engineers are, however, likely to find plenty of scope there, as the country is rapidly being opened up in this direction. Particulars can be obtained from the Japanese Embassy in London.

A Sketching Tour.

LONDON, S.E.—LEAD LIGHTS writes: "I propose to go for a week's sketching tour in preparation for the R.I.B.A. final examination. Please suggest a good district. Could I do better than the Eastern counties?"

See replies to enquiries under heading "Sketching Tour round East Coast" on p. 484 of our issue for July 24th last, and "English Tour for Architectural Student" on p. 105 of our issue for March 13th last.

Taking-off Quantities of Stone Sill.

Beeston.—Notts writes: "Kindly explain the method of taking off the quantities of a stone window sill as per enclosed sketch (not reproduced). The method I refer to is the one by which the stone and labour are taken separately."

The centre sill being shown sunk at the back, causes this stone to be 2in. wider than the section; hence:

	6 0		
	11		
	7	Stone in scantling length.	
			Centre.
	6 0		
	11	Bed and joint.	
	11		
	7		
	5 0		
	7	Rough sunk face.	
			Back.
2/	9		
	7	Sunk joint.	
			Ends.
2/5	3	Plain face 2in. wide.	
2/	7		*Front and underedge.*
			5 3
	6 5		2/7 = 1 2
	2	Deduct half bed.	
			6 5
2/	7	Sunk face 2in. wide.	
			Ends.
	3 6		
	6	Stopped sunk face.	
			Top.
2/		Stoppings to sinking 6in. girth.	
2/1	5		
	6	Rebated sunk face.	
			For stools.
	5 6	Stopped groove.	
2/		Mitres.	
	6 3	Stopped throat.	
2/		Mitres.	
2/3	6		
	9		
	7	Stone.	
			Ends.
2/3	6		
	9	Bed and Joint.	
2/	9		
	7		
	3 6		
	7	Half Sawing.	
			Back.
			0 9
			0 4
			1 1
2/1	1		
	7	Sunk joint.	
			End.
2/2/3	0	Plain face 2in. wide.	
			Front and underedge.
2/3	0		
	2	Deduct half bed.	
	2 0		
	6	Stopped sunk face.	
			Top.
2/2/		Stoppings to sinking 6in. girth.	
2/	4		
	6	Rebated sunk face.	
			For stools.
2/	8		
	6	Rebated sunk face stopped.	
2/		Stoppings to sinking 6in. wide against splayed face.	
2/3	3	Groove.	
2/3	0	Throat.	

For further information see "Quantities and Quantity Taking," by W. E. Davis, price 3s. 6d.

R.I.B.A. Testimonies of Study.

Glasgow.—A Constant Reader writes: "I am drawing out my testimonies of study for the R.I.B.A. Intermediate Examination. In drawing the Classic ornament, sheet No. 3, would a capital of an antæ taken from the Erechtheium at Athens be sufficient; also, in sheet No. 6, would an Early English spandrel which is a typical example of the style be sufficient? Can both be drawn in pencil?"

The examples you mention are sufficient and can be drawn in any medium you like—ink, pencil or silverpoint—so long as they are in outline.

R.I.B.A. Glasgow Examinations.

Glasgow.—G. S. writes: "Is there any likelihood of the R.I.B.A. examinations being held in Glasgow next November?"

We are informed that if there are sufficient candidates from Scotland an examination may probably be held in Glasgow.

Recovery for Loss caused by Sewer.

London, S.W.—M. M. B. writes: "A friend of mine owns a couple of meadows in a parish in West Surrey through which the local council last year laid a 9in. pipe sewer. The sewer has since been twice taken up and relaid—once by a fresh contractor, and lastly by the council's employees—the work of the two contractors having been badly executed. As a consequence, on several occasions my friend's meadows were in part at the mercy of the council. Once he was deprived of his hay from the area occupied by the sewer, on the other occasions the hay season was over and only the pasture was damaged. (1) How much per yd. or rod super. should I charge for loss of hay? (2) How much for loss of pasture on the two later occasions of reconstruction? (3) What is a fair charge for wayleave?"

(1) The charge must depend on the local value of the hay which has been lost or damaged. The tenant or landowner should be able to give you some idea of the actual loss sustained, and on such information the claim should be based. (2) This again entirely depends on the nature and extent of the damage which has taken place; the rental value of the pasturage and other similar particulars will also assist you in arriving at a proper valuation. (3) No hard-and-fast charge can be laid down as applicable to every case of this description, and the surveyor or valuer must be guided by local circumstances. T. E. C.

Formula for Struts.

Carlisle.—Student writes: "What alteration would there be in the formula for struts given on page 43 of Hurst's 'Handbook,' where mild steel is used instead of wrought iron? Would there be any variation in the values of '*a*' on page 44? Please mention a good cheap book on steel."

Our edition is not the same as yours, but we presume you refer to the formula

$$W = \frac{16S}{1 + \frac{l^2}{ad^2}}$$

This is the same as that given for wood pillars and struts, with the exception that the crushing force of wrought iron in tons per sq. in. (namely 16) is given instead of F. With other materials use other values instead of the 16, that for mild steel being 80 for cast and 50 for puddled. The values of a would not vary with wrought iron other than for the various sections given. Prof. Henry Adams's book on "The Practical Designing of Structural Ironwork" (price 7s.) is to be recommended.

Erections beyond the Building Line.

Stoke-on-Trent.—P. M. writes: "The owners of building plots A and B on the enclosed plan (not reproduced) have mutually covenanted that they will not erect any main building beyond the building line shown on the plan herein drawn (*i.e.*, in the deed). Could either prevent the other from erecting one-storey or two-storey bay windows beyond the building line, or building chimney breasts so as to project 9in. or 14in. beyond the building line, the outside of main wall being within or on the building line?"

No. The use of the adjective "main" to qualify "building" is decisive. Bay windows and chimney breasts are not main buildings, but adjuncts. G. A. T. M.

Correspondence.

On the Settling of Accounts by Architects.

To the Editor of The Builders' Journal.

Sir,—There is one phase of the relations between architects and builders that might well form the subject of a discussion in your columns. Every builder is aware of the difficulty generally experienced in obtaining a settlement when a contract is completed. The architect and his client are keenly insistent on work being carried out to time; and as a rule this is done, for it is not to any builder's interest to dally with work. When settling time comes, however, the architect's interest in the job seems suddenly to have ceased; and, with rare exceptions, he has not time to square up the accounts. It is no uncommon thing for builders to have to wait six months, twelve months and even longer for a settlement. I maintain that this is a gross injustice to a body of men who have more difficulties to contend with than any other tradespeople. The remuneration of 90 per cent. of employers in the building trade is far lower than that in any other important industry and altogether out of proportion to the work and worry entailed. The slowness of return is to a great extent the cause of this, and the indifference and dilatoriness of architects is mainly responsible for it. I trust that a full expression of opinion on this subject will lead to a better understanding between architects and builders.—Yours truly,

LANCASHIRE BUILDER.

Keystones.

A New Central Fire Station at Scarborough has been erected in North Marine Road, and a district fire station in Alga Terrace, South Cliff.

Avening Church, the restoration of which is proposed, is one of the oldest church in Gloucester, or indeed in England. It still shows portions which were consecrated a year or two after the Norman Conquest.

A New United Methodist Free Church at Ilford is being erected in Ilford Lane. The new church, which will be of brick with Bath stone dressings, will comfortably seat 650 persons. Late Gothic is the style adopted, and there is to be a spire rising to a height of 75ft. from the ground.

No. 43, Gerrard Street—in which the poet Dryden died in 1700—will have to undergo alterations, even if it be not pulled down, as the front is considered in a dangerous condition. Though the upper storey of the house is plain, the staircase is fine and remains characteristic of the time of Dryden; it still retains corkscrew banisters and mahogany rail.

Cottages for the King's Labourers.—The King is having thirty or forty commodious cottages built on the Crown land at Old Windsor for labourers on the royal estate. The men have been paying 5s. and 6s. a week rent for houses owned by private persons, but the rent of the new cottages will be only 2s. 6d. a week. No lodgers are to be taken.

A Parish Institute at Stocksfield is to be erected from the plans of Mr. Balden, architect, on a site near Mount View Terrace, and within about 200 yards of Stocksfield Station. It will comprise a library 23ft. by 18ft., a billiard-room 30ft. by 23ft., a hall 63ft. by 26ft., and caretaker's quarters. The building is estimated to cost about £1,600.

Old Paris, like old London, is fast disappearing. Most visitors to the French capital have seen the quaint church of St. German-des-Prés, the oldest in Paris, but few have gone round its north side and seen the fine old houses and ancient abbey. The abbey has been so much scraped, painted and otherwise deprived of its original architectural character that it is scarcely recognisable, and it will soon be almost entirely hidden, large sheds being built in front of it. The charming old houses facing the abbey are coming down. One of these, dating from the seventeenth century, though somewhat dilapidated, was covered with ivy and was the delight of artist and amateur. Huge business premises are to be erected in its place.

A New Technical School and Free Library at Haslingden is to be erected at a cost of £6,665. The building will be situated on Bury Road.

The Chancel of Castle Donington Church is proposed to be restored. The spire of this church, tapering to a height of 180ft., is a conspicuous object in the district, and can be seen for many miles. The chancel was not included in the restoration of 1877.

St. Oswald's Church, Hebburn, is to be completed, and the foundation stone of the chancel was laid last week. The scheme, it may be mentioned, comprises the addition to the church of chancel, vestry, organ chamber and bell turret, the provision of which, it is estimated, will incur an expenditure of not less than £1,500. Messrs. Cowper & Henderson, Jarrow, are the contractors.

The North Ward of the Swansea Hospital is now undergoing extensive alterations. A new teak floor is being laid by Messrs. Arrowsmith, of New Bond Street, London; and new sanitary arrangements by Messrs. George Jennings are being fixed. It is expected that the work will be completed and opened by the beginning of next year. The whole of the work is being carried out from designs under Mr. Glendinning Moxham, architect, of Swansea.

Kensington Avenue Board Schools, East Ham, were formally opened on Saturday, August 31st, by Rev. J. H. Ware, M.A., Rural Dean, chairman of the East Ham School Board. The schools are built to accommodate 1,573 children—541 infants, 516 girls and 516 boys—at a cost of £20,522, exclusive of furniture and site. The builders are Messrs. Gregar & Son, Jupp Road, Stratford, and the architect is Mr. S. Jackson, 65, Fenchurch Street, E.C. The design for these schools was illustrated in our issue for November 14th last.

New Swimming Baths at Chester have been erected on a site in Union Street facing the Grosvenor Park by Mr. W. Freeman, builder and contractor, of Chester, at a cost of £12,000; the site cost another £1,500. The plans were prepared by Messrs. Douglas & Minshull, architects, of Chester. There are two swimming baths of considerable dimensions, and the accommodation includes a number of slipper baths.

All Saints' Mission Church, Newton Abbot, was reopened recently after renovation of the sanctuary. In addition to three new ventilators, the walls have been decorated in light tones of green and cream, new draperies and dossel by William Morris & Co., of London, have been added, as well as a new oak table executed by Mr. Hugh Mills, who also carried out the whole of the work. A new classroom has also recently been added to the school at a cost of between £300 and £400.

The Birmingham Oratory is to have additions made to it as a memorial to Cardinal Newman. These are to be of a very simple character, if they are to be in keeping with the original design. Plans have been prepared for a suitable church at an estimated cost of at least £23,000. The church, as Newman built it, was merely four brick walls, requiring no design beyond that of the local builder. Somebody has described it as having the appearance of a riding school. Yet the first idea of Newman had been very ambitious indeed. His intention was to build in miniature a sort of St. Mark's, Venice, the church he most of all admired, and there are still preserved some plans made in this spirit by M. Viollet le Duc, who was among the distinguished visitors to Newman in Birmingham.

The Old Church of St. Margaret, Palling-next-the-Sea, a small fishing village on the extreme east coast of Norfolk, is rapidly decaying and is proposed to be repaired. Among the relics of its former state and condition are a fourteenth-century font and an old oak door with the original lock and key of the same period. The remains of the chancel screen, old glazed tiles, piscinæ, and windows still speak of bygone grandeur, and will be carefully preserved, but the present needs are for structural repairs only. The architect states that an entirely new roof for the nave and the rebuilding of the chancel arch and part of the north and south walls of the nave are an absolute necessity, while new stonework is needed for the windows. About £1,700 will be needed, and there is no prospect of raising so much in the district.

The Liverpool Sanatorium for consumptive cases, in Delamere Forest is now completed.

The Additions to the Grammar School, Pontefract, are being warmed and ventilated by means of Shorland's patent Manchester grates and patent extract ventilators, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

New Offices for the Holywell Guardians are to be erected, with new receiving ward, &c., at a cost of £4,800, on a site adjoining the main workhouse building. The contractor is Mr. Richard Jones. The plans have been prepared by Messrs. J. H. Davies & Son, architects, of Chester.

Homes for Aged Miners.—The foundation stone was laid recently of the Northumberland Aged Mine Workers' Homes at East Chevington, Broomhill. The land on which the houses are to be built covers an area of 1,400 sq. yds. The cottages, ten in number, will be self-contained, with two rooms each, and yards with the usual out-offices, and a garden plot in front. These will be proceeded with at once, and, it is expected, will be finished within four months.

A Monument to Lord Airlie is being raised on Tulloch Hill, near Cortachy, in Forfarshire. It is modelled on the lines of the old border beacon or warning tower. It is Scottish Baronial in style, with something of the character of that of Airlie Castle, or of the more recent Red Lodge of Cortachy, and is intended to be used, with its signal platform and beacon, on occasions of national or estate rejoicings. The foundation consists of a cairn or platform formed round the base of the monument, with large boulders taken from the hill, while the base proper is set apart for telling the story of the life of the late Earl and his military service. In the base are placed carved panels representing the arms of the Airlie family with inscriptions, and the badges of the regiments in which the late nobleman served. It is 65ft. high, on an eminence 1,230ft. above sea level, and has cost £1,300. It is visible not only throughout the whole valley of Strathmore, but from Perthshire, Fifeshire and Kincardineshire.

A New Grocer's Shop and Cafe at Pontefract have been just completed in the Beastfair for Mr. George Hemmant by Messrs. G. Shepherdson & Sons, shopfitters, of Driffield. The front has been carried out in Cuba mahogany, Aberdeen granite, St. Anne's marble and mosaic entrances. The internal fittings and fixtures are all in best mahogany Sicilian marble and faïence tilework. The cafe is on the first floor, and includes gentlemen's and ladies' lavatories, billiard and smoke-rooms, &c. The faïence work has been supplied by Messrs. Carter & Co., of Poole, and the mosaic by Messrs. G. Woolliscroft & Co., of Hanley. The shop is fitted up with a Waygood's lift, and the whole of the fireplaces and stoves are carried out in Burmantoft's ware on the first floor and in the billiard-room. The cafe has been decorated in artistic colours with Hall's washable distemper, and the lavatories carried out in Messrs. Blundell S. Spence & Co.'s petrifying liquid. The ventilating apparatus has been supplied by Messrs. Crossley & Son, of Halifax. The whole of the works have been carried out from the designs of Mr. Charles Keyworth, architect, of Pontefract.

A New Cattle Market at Bodmin has been erected on an acre of ground at West Heath. The work has been carried out by Mr. E. Harris, contractor, Bodmin, and the cost has been about £2,000 exclusive of site. Provision has been made for about 660 sheep, and bullock lairs have been laid for about 600 animals. Roundabout another 400 could be accommodated. The market yard is enclosed by a substantial wall, and it is properly drained. Water is laid on from the mains of the Bodmin Water Co. The eight hydrants fixed will enable those in charge to thoroughly clean the yard in a very short time. The floor is composed of asphalt, while the surface of the lairs is of Portland cement. There are two double lairs and two single lairs. A spacious shed 100ft. in length and 30ft. in width will shelter cows and fat bullocks. The necessary offices include a toll house, an office, a shed for those attending the market, and a weighing house. There are two entrance gates. In the near future there will be two additional gates, giving means of egress and ingress to a new public road. Mr. E. J. Oliver, borough surveyor, designed the premises.

An International Theatre is about to be established in Paris by M. Leon Cavello, who has obtained a concession for the purpose. The building will be erected in the Champs Elysées.

No Photographing at Tintern Abbey.—Now that Tintern Abbey has been purchased by the Crown, the photographing of the beautiful old ruin is no longer permitted. It would be interesting to know the reason for this prohibition.

New Board Schools at Chopwell have been erected; they are built of red bricks, and will provide accommodation for 650 children, the mixed department seating 450 and the infants' department 200. The work has been carried out by Messrs. Turner Brothers, Gateshead, from plans prepared by Mr. Oswald.

The Electric Lighting System at Windsor Castle and plant which were inaugurated some months before the death of Queen Victoria are being extended on a very big scale by command of the King. Under the supervision of the Office of Works a staff of upwards of thirty men are now employed in wiring the State rooms, the private apartments, kitchens, &c., from the central station of the Windsor Electrical Installation Company.

Mrs. Brown-Potter's Proposed Boathouse.—We regret we were unable to give the following particulars in our last issue, when the illustration of the design by Mr. Lionel F. Crane was published. Nothing definite is settled as yet. Provision is made for store-rooms for boats, &c., at the water level, and on the ground floor there is a summer-room which could be used for tea, &c., two bedrooms and a bathroom. There are also three or four bedrooms in the roof. The building in fact would be a sort of annexe to the house, so that visitors could be accommodated should the house be full. The lower part of the building would be of tarred oak, and the woodwork to the summer room, &c., of deal painted white. The part of the building facing the land would be of brick rough-casted, and the roof would be covered with red tiles.

The Clergy and Artists' Association for the improvement of art in churches will hold their sixth annual Church Congress exhibition in the Pavilion, Brighton, by permission of the committees of the Pavilion and the Church Congress during Congress week. The great feature, as before, will be the exhibition of the personal work of artists working independently in churches, and will include, in addition to examples of work executed under the auspices of the association, a representative collection of the work of individual artists working in churches. Artists wishing to submit work may do so on addressing the secretary by letter at the offices, 6, Millbank Street, Westminster, S.W., up to September 21st. The committee are glad to consider any work of suitable design, direction and feeling. The hon. secretary writes that a list of work in churches throughout the country and the colonies executed through the association during the six years of its work is being prepared and will be sent to any persons desirous of information from the offices of the association.

Surveying and Sanitary Notes.

A New Road at Grimsby has been presented by Sir Walter Gilbey, owner of the Little Coates Estate, near Grimsby; it is about one and three-quarter miles in length, and situated near the site of the proposed new docks in the estate.

Portsmouth Drainage.—For some time past Portsmouth has been threatened with a difficulty over its drainage, and the sanitary committee propose to spend something like a quarter of a million of money on a new scheme which will afford the necessary relief and satisfy the Treasury, who, it will be recollected, threatened to stop their contribution to the local rates if a new scheme is not provided. Portsmouth is one of the very few towns in the kingdom which possess a limit to the rate for sanitary purposes and the finance committee now intimate that if this expensive scheme for drainage be undertaken, that limit (which is 2s 6d. in the £) must go. The matter is one which is likely to give rise to a lively controversy.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Sept. 13	Llanedy, Carmarthen—School	School Board	J. Davies & Son, Cowell House, Llanelly.
„ 13	Colchester—School	School Board	Goodey & Cressall, Victoria Chambers, Colchester.
„ 13	Ovenden, Yorks—Shed	——	J. F. Walsh & G. Nicholas, Museum Chambers, Harrison Rd., Halifax.
„ 13	Kilmallock—Repairing Roofs, &c., of Workhouse	Union Guardians	J. M. Martin, Clerk's Office, Kilmallock Union, Kimallock.
„ 13	Bradford-on-Avon, Wilts—Renewing Tiles, Rafters, &c.	——	No. 56 Trowbridge Road, Bradford-on-Avon.
„ 14	Flookburgh, Lancs—Rebuilding	Miss Seath	Field Head Farm, Flookburgh.
„ 14	Patterdale, Westmoreland—Police Station	——	J. Bintley, 7 Lowther Street, Kendal.
„ 14	Hetton Downs, Sunderland—Premises	Co-operative Society	W. & T. R. Milburn, 20 Fawcett Street, Sunderland.
„ 14	Llanfairfechan, Wales—Business Premises & Residence	W. Eames	R. Davies, 125 High Street, Bangor.
„ 14	Perth—Workmen's Houses	Town Council	R. M'Killop, 12 Tay Street, Perth.
„ 14	Bristol—Warehouses, &c.	——	H. Williams, Imperial Chambers, Corn Street, Bristol.
„ 14	Sledmuir, Kirriemuir—Shed	——	D. Ross, Road Surveyor, Kirriemuir.
„ 14	Nottingham—Entrance Lodge, &c.	Corporation	F. B. Lewis, City Architect, Guildhall, Nottingham.
„ 14	Coventry—Alterations, &c., to Premises	General Municipal Charities Trustees	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
„ 16	Burley-in-Wharfedale—Dwelling House, &c.	——	D. Dodgson, 86 Albion Street, Leeds.
„ 16	Tarves—Villa	——	J. Cobban, Architect, Estate Office, Haddo House.
„ 16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
„ 16	Mansfield—Schools	School Board	Vallance & Westwick, Mansfield.
„ 16	Birmingham—Cottages, &c.	Guardians	Whitwell & Sons, 23 Temple Row, Birmingham.
„ 16	Dowlais, Wales—Cottages	Trustees of the Caeracca Building Club	W. Dowdeswell, Architect, John Street, Treharris.
„ 16	Crumlin, Mon.—Inn	Webb Brothers & Co.	R. L. Roberts, Architect, Abercarn.
„ 16	Houghton Regis, Dunstable—Additions to School	School Board	J. R. Brown & Son, Castle Street Chambers, Luton.
„ 16	Kirkburton, near Huddersfield—Laundry, Boiler House, &c.	Asylums Committee	J. V. Edwards, County Surveyor, County Hall, Wakefield.
„ 16	Newcastle-upon-Tyne—Cookery School	Public Libraries Committee	J. W. Dyson, 67 Grey Street, Newcastle.
„ 16	Pontlottyn, Wales—Two Houses	——	W. Davies, Architect, Pontlottyn.
„ 16	Woolwich—Reception House for Dead Bodies	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
„ 16	Wrexham—Division Wall and Lights	Town Council	Borough Surveyor, Guildhall, Wrexham.
„ 16	Belfast—Two Semi-detached Villas	——	T. Houston, Architect, King's Court, Wellington Place, Belfast.
„ 17	London, E.C.—Alterations to Underground Convenience	Corporation	Engineer to Corporation, Guildhall, E.C.
„ 17	Belfast—Alterations to Workhouse	Guardians	J. C. Neeson, Clerk, Union Workhouse, Belfast.
„ 17	Aberdeen—Post Office	Commissioners of H.M. Works	H.M. Office of Works, Edinburgh.
„ 18	Great Heath, Foleshill—Offices, Extension of Factory	Lester, Harris & Co.	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
„ 18	Swansea—Offices	Harbour Trustees	Harbour Offices, Swansea.
„ 18	London, W.C.—Casual Wards	Guardians of the Poor of Holborn Union	H. W. Mellor, 17 Buckingham Street, Adelphi, W.C.
„ 18	Eggesford—Works at Bridge	County Council	H. Michelmore, Clerk of the Council, Castle of Exeter.
„ 18	London, S.E.—Kitchen Accommodation at Workhouse	Lambeth Guardians	W. Thurnall, Clerk, Guardians' Offices, Brook Street, Kennington Road, S.E.
„ 19	Kirkmichael, Scotland—Rebuilding	——	J. Sim, Architect, Montrose.
„ 19	Ballymacarrett—Completion of St. Patrick's Parish Church.	——	S. P. Close, Architect, Donegal Square Buildings.
„ 19	Cults—New United Free Church	——	D. & J. R. M'Millan, 211 Union Street, Aberdeen.
„ 21	Ince, near Wigan, Lancs—Public Offices	Urban District Council	Heaton, Ralph & Heaton, Architects, Wigan.
„ 21	Dorchester—Works	Trustees of Municipal Charities	A. L. T. Tilley, Architect, Dorchester.
„ 21	Mynachlogddu, Pembrokeshire—Schoolroom and House	School Board	W. J. Williams, 1 High Street, Cardigan.
„ 21	Ashford, Kent—Additions, &c., to Schools	School Board	Jeffrey & Lacey, Architects, Ashford, Kent.
„ 23	Newcastle-under-Lyme, Staffs—Alterations at Workhouse.	Union Guardians	Chapman & Snape, Architects, Newcastle-under-Lyme.
„ 23	Leeds—Coal Stores	City Council	R. H. Townsley, Gas Offices, Dewsbury Road, Leeds.
„ 24	Bromley, Middlesex—Alterations, &c., to Asylum Mortuary.	Poplar and Stepney Asylums Managers	J. & S. F. Clarkson, 136 High Street, Poplar, E.
„ 24	Trealaw, Wales—Twenty to thirty Cottages	New Century Building Club	A. O. Evans, Architect, Pontypridd.
„ 26	Burry Port, Wales—Schools, &c.	Pembrey School Board	R. Williams, Architect Burry Port.
Oct. 1	Carrickfergus, Ireland—Repairs to Houses	Governors of Shiels's Institution	Superintendent, Shiels's Institution, Carrickfergus.
„ 8	Tooting, S.W.—276 Cottage Dwellings	London County Council	Housing Branch of Architect's Department, 18 Pall Mall East, S.W.
„ 10	Pontypool—Hospital	——	R. Williams, 10 Clifford Inn, Fleet Street, E.C.
	ENGINEERING:		
Sept. 13	Kirkcaldy, Scotland—Overhead Construction for Electric Tramways.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 13	Torquay—Arc Lamp Carbons	Electric Lighting Committee	P. Storey, Borough Electrical Engineer, Electricity Works, Torquay.
„ 14	Shrewsbury—Heating	——	Churchwardens, Abbey Church, Shrewsbury.
„ 14	Warrington—Electric Lighting, &c.	Corporation	J. Deas, Engineer, Bank House, Warrington.
„ 14	Dundee—Overhead Equipment	Town Council	W. J. Tittensor, City Electrical Engr., Dudhope Cres. Rd., Dundee.
„ 14	Batley—Permanent Way	Corporation	Lacey, Clirehurst & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 14	Llandudno—Waterworks	Urban District Council	E. P. Stephenson, Engineer & Surveyor to the Council, Llandudno.
„ 14	Doncaster—Electric Tramway Poles and Overhead Construction.	Corporation	C. A. L. Prusmann, Borough Electrical Engineer, Grey Friars Road Doncaster.
„ 14	Manchester—Electric Trolley Wire, &c.	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.
„ 14	Salford—Steam Dynamo at Ladywell Sanatorium	Health Committee	C. D. Taite, Strawberry Road Electricity Works, Salford.
„ 14	Christchurch—Wind Engine	Union Guardians	A. Druitt, Clerk to Guardians, Christchurch.
„ 16	Kirkcaldy—Arc Lamp Posts, &c.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 16	Whitehaven—Incandescent Lamps	Water and Lighting Committee	P. J. Watts, Borough Electrical Engineer, Electricity Works, Whitehaven.
„ 16	Chorley, Lancs—Water-Mains, &c.	Rural District Council	A. Jolly, 9 High Street, Chorley.
„ 16	Ramsgate - Sinking Well	Isle of Thanet Joint Hospital Board	Mr. Launcefield, Clerk of Works, Haine Road, Ramsgate.
„ 16	Bournemouth—Tramway Works	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
„ 17	Amble—Water Main	Urban District Council	Council's Offices, 31 Queen Street, Amble.
„ 17	Bournemouth—Conduit Permanent Way Construction	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
„ 17	East Ham, E.—Tramway Permanent Way Works	District Council	A. H. Campbell, Engineer, Public Offices, East Ham, E.
„ 17	Blairgowrie, Scotland—Bridge, &c.	Perthshire County Council	Blyth & Westland, 135 George Street, Edinburgh.
„ 17	Dartford—Sewage Pumping Station	Urban District Council	W. Harston, Surveyor to Council, High Street, Dartford.
„ 18	Yealmpton, Devon—Waterworks	Plympton St. Mary Rural District Council	F. A. Clarke, New Town Chambers, Old Town Street, Plymouth.
„ 18	London, E.—Electric Mains Extension	Poplar Borough Council	Borough Electrical Engineer, Electricity Works, Glivens Street, Bromley-by-Bow, E.
„ 18	Eggesford—Bridge Works	Devon County Council	H. Michelmore, Clerk, Council's Office, Castle of Exeter.
„ 19	Annalong, co. Down, Ireland—Harbour Improvements	County Council	County Surveyor, Court House, Downpatrick.
„ 21	Buxton—Works	Gas Committee	H. Barker, Gas Engineer, Town Hall, Buxton.
„ 20	Calais—Locks and Aqueduct	——	M. Thanneur, Ingénieur-en-Chef, à Boulange-sur-Mer.
„ 25	Glasgow—Electric Cables	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 25	Bury, Lancs—Refrigerating, &c., Plant	Health Committee	A. Neill, 18 Coleridge Street, Leeds.
„ 25	Dartford—Kitchen Fittings	Metropolitan Asylums Board	A. & C. Harston, 15 Leadenhall Street, E.C.
„ 25	Middlesbrough—Pumping Engines	Sanitary Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
„ 25	Havana—Sewerage System, &c.	——	Lieutenant W. J. Barden, Chief Engineer, City of Havana.
„ 26	Gateshead—Timber Staith	Health Committee	Borough Engineer, Town Hall, Gateshead.
„ 26	Bude, Cornwall—Waterworks	Stratton and Bude Urban District Council	B. Latham, Parliament Mansions, Victoria Street, Westminster.
„ 26	Hull—Steam Engines and Boilers	Electric Lighting Committee	T. G. Milner, City Treasurer, Town Hall, Hull.
„ 28	Reading—Tramways	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
„ 30	Rio de Janeiro—Docks	Brazilian Minister of Industry and Public Works.	Commercial Department, Foreign Office, S.W.
„ 30	Listowel—Electric Lighting Scheme	Urban District Council	E. J. Gleeson, Clerk, Listowel.
Oct. 1	Hadsund, Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes Köntor, Reventlowsgade, 10 Copenhagen, B.
„ 1	Leicester—Pumping Machinery	Corporation	E. G. Mawbey, Borough Engineer & Surveyor, Town Hall, Leicester.
„ 1	Banff—Water and Drainage Works	District Committee	J. Barron, 1 Bon Accord Street, Aberdeen.
„ 5	Monaghan—Waterworks	Urban District Council	J. L. Devenish-Meares, Town Hall, Newry.
„ 8	London, S.W.—Tramways	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 8	London, S.W.—Continuous Current Plant	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 15	Fishguard, Pembrokeshire—Extension of Pier	Railways and Harbours Company	Secretary, Paddington Station, London.
Dec. 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works, Sydney.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
Sept. 14	Glasgow—Pipes	Corporation	J. M. Gale, 45 John Street, Glasgow.
" 14	Blackpool—Railway	Corporation	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 17	London, E.C.—Railway Stores	Burma Railways Company, Ltd.	Company's Offices, 76 Gresham House, Old Broad Street, E C.
" 17	London, E.C.—Railway Stores	Southern Mahratta Railway Company, Ltd.	E. Z. Thornton, Secretary, 46 Queen Anne's Gate, Westminster, S.W.
" 17	Bournemouth—Steel Rails, &c.	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
" 18	Netherlands—Asphalted Cast Iron Pipes, Railway Carriages, &c.	Ministry for the Colonies	Commercial Department, Foreign Office, S.W.
" 19	London, S.W.—Cast-Iron Piping, &c.	Uganda Railway Company	Crown Agents for the Colonies, Downing Street, S.W.
" 19	Bradford—Miscellaneous Goods	Gas Committee	F. Stevens, Town Clerk, Town Hall, Bradford.
" 20	London, W.C.—Rails, &c.	British Electric Traction Co., Ltd.	Chief Engineer of the Co., Donington House, Norfolk St., Lon., W.C.
Oct. 1	Alexandria, Egypt—Mooring Chains	Administration of Ports and Lighthouses	Controller-General of Ports and Lighthouses, Alexandria.
	PAINTING AND PLUMBING:		
Sept. 13	Preston—Painting, &c., in Parks	Corporation	Borough Surveyor, Town Hall, Preston.
" 14	Kendal—Painting at Abbey House	Union Guardians	A. Milne, Clerk, Lowther Street, Kendal.
" 19	Leighton Buzzard—Painting, &c., Isolation Hospital	Urban District Council	Surveyor, 31 High Street, Leighton Buzzard.
	ROADS AND CARTAGE:		
Sept. 14	Chelmsford—Street Works	Urban District Council	H. G. Warne, Avenue Chambers, Market Road, Chelmsford.
" 14	Cockermouth—Widening	Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
" 14	Fleetwood, Lancs—Broken Stone	Urban District Council	J. Tildsley, Clerk, Town Hall, Fleetwood.
" 14	Halifax—Formation of Street	——	W. C. Williams, 29 Southgate, Halifax.
" 16	London, W.—Street Works	Hanwell Urban District Council	S. W. Barnes, Council Offices, Church Road, West Hanwell.
" 17	London, E.C.—Wood and Asphalt Paving	Corporation	Engineer to Corporation, Guildhall, E.C.
" 17	London, S.E.—Paving	Deptford Borough Council	V. Orchard, 20 Tanner's Hill, Deptford, S.E.
" 17	Amble—Making-up	Urban District Council	Council's Offices, 31 Queen Street, Amble.
" 17	Croydon—Roads Repairs	Town Council	Borough Road Surveyor's Offices, Town Hall, Croydon.
" 18	Newcastle-on-Tyne—Wood-Paving	North-Eastern Railways Co.	C. A Harrison, Central Station, Newcastle-on-Tyne.
" 18	Bolton-upon-Dearne, Yorks—Asphalting Playgrounds	School Board	G. Dickson, Clerk, Bolton-upon-Dearne.
" 18	Wimbledon—Making-up Roads	Urban District Council	C. H. Cooper, Surveyor, Council Offices, The Broadway, Wimbledon.
" 19	Woolwich—Street-Sweeping Machines, Slop Carts, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 20	Lewes—Making-up Roads	Town Council	Borough Surveyor, Town Hall, Lewes.
" 25	Middlesbrough—Paving	Streets Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
" 28	Witham, Essex—Indulated Stone-Paving	Urban District Council	W. P. Perkins, Surveyor, Witham.
Oct. 1	London, S.W.—Footpaths	Middlesex County Council	H. T. Wakelam, County Surveyor, Guildhall, Westminster.
	SANITARY;		
Sept. 14	Maldon, Essex—Sewers, &c.	Rural District Council	H. G. Keywood, Public Hall Chambers, Maldon.
" 16	Chelmsford—Sewer, &c.	Rural District Council	J. Dewhirst, Surveyor, Avenue Chambers, Market Rd., Chelmsford.
" 16	Dalry, Scotland—Sewage-Disposal Works	Ayrshire County Council	J. Barr, 221, West George Street, Glasgow.
" 18	Mytholmroyd, Yorks—Main Drainage Works	Urban District Council	S. Shaw, Church Street Chambers, Dewsbury.
" 20	Durham—Cleaning Ashbins	Corporation	City Surveyor, Market Place, Durham.
" 20	Failsworth, Lancs—Removal of Night Soil	Urban District Council	Inspector of Nuisances, Council Offices, Failsworth.
Oct. 8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
	TIMBER:		
Sept. 30	London, E.C.—Telegraph Poles, &c.	——	C. E. Stuart, Controller of Stores, General Post Office, E C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 16	Blackpool—Laying-out Land	£30, £15 and £5	Borough Surveyor, Town Hall, Blackpool.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
" 21	Leeds—Public Baths at Junction of Calveley and Broad Lanes, at cost not exceeding £8,000.	£30, £20, £10 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
" 21	Leeds—Public Baths and Branch Free Library in York Road, at cost of £15,000.	£50, £30, £15 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds
" 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
" 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov. 15	London, N.W.—New Offices in Euston Road	£100, £75 and £50.	S. R. J. Smith, 14 York Buildings, Adelphi, London, W.C.

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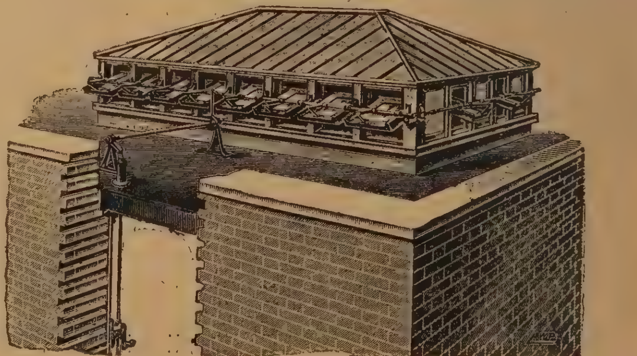

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Trade and Craft.

Boilers for Hot-Water Supply.

Messrs. Hartley & Sugden, Ltd., of Atlas Works, Halifax, send us a copy of their new boiler catalogue, which is excellently printed. A good feature is the statement of actual heating powers of the various boilers, the calculations being based on the ability of 1 sq. ft. of direct heating surface to heat (with economy and under average conditions) 35ft. of 4in. pipe, and the flues in proportion. In the "Notes" given at the beginning of the catalogue attention is drawn to the necessity, in constructing flues in the brick-setting of boilers, not to throttle the draught: 5in. and more of flue space should be left, according to the size of the boiler. Boilers are sometimes irreparably damaged or soon worn out by deposit and accumulation of sediment. To avoid this evil it is absolutely essential to have mudholes or plugs, so that the interior of boilers can be regularly and thoroughly cleaned at intervals. This is especially important in districts where the water contains lime in solution. The "Lawrence" boiler is slightly more expensive than some other patterns, but presents an unusual amount of heating surface by an inner circle of tubes and a circular flue round the boiler. Two of these boilers of the largest size are heating the Apollo Theatre, London. The "Effective" boiler has increased heating surface provided by bent tubes in the firebox and two large open flues behind the firebox. The "Hornet" boiler is the firm's newest pattern. It has two heating chambers, one at each side of the firebox, and either of these may be shut off at pleasure when a reduced heat is required. The waterway walls of the firebox are so arranged that sediment will fall to the bottom of the boiler. The "Wasp" boiler is especially useful for a smaller apparatus than those we have already mentioned, although it may be made in larger sizes. Its chief feature is a jacket which provides a flue service all round the outside of the boiler, thus considerably increasing its heating power for the same consumption of fuel. The No. 3E pattern is a boiler exceptionally useful for hotel purposes, or in any case where a large hot-water supply is required. This boiler is provided with a waterway bottom so that no injury can be done to it by the rapid drawing off of hot water. The "Hotel" boiler is similar, with a mantle providing an outer flue and thus increasing the economy of fuel. These are some of the boilers made by Messrs. Hartley & Sugden, but in addition to those for heating buildings there are others for providing steam for cooking, agricultural and motor purposes. All are constructed of wrought iron, and therefore not so liable to fracture and failure as cast-iron boilers.

New Companies.

Chytane China Clay Co., Ltd.

Registered to acquire clay mines, brick clay tin ore, mining workings, mining claims and ground in Cornwall or elsewhere; in particular to acquire mining rights in relation to all such parts of the lands of F. Retallack, called Chytane and Chypraze, in the parish of St. Enoder, Cornwall, as are demised for such purpose by the said F. Retallack to Colonel R. J. Morrison, F. C. Frost and T. H. Bennett, and to carry on the business of china-clay merchants, brick and tile merchants, coal, stone, lime, timber, building material and machinery merchants, tin ore merchants, engineers, &c. Capital £3,000 in £1 shares. Registered office: 23, Orchard Gardens, Teignmouth, Devon.

Romiley Spinning Co., Ltd.

Registered to carry on the business of spinners weavers, &c.; also to carry on the business of brick and tile makers, but only to the extent of using up any clay found on the company's land. Capital £10,000 in £5 shares. The first directors are H. W. Whitworth, G. R. A. Ashworth, T. Walton, J. Hall and J. H. Pickup.

Godwin & Hewitt, Ltd.

Registered August 17th to carry on the business of manufacturers of and dealers in bricks, tiles, pipes, terra-cotta, pottery, sanitary ware, fireplaces chimneypieces, kerbs, colours, glazes, &c. Capital £25,000 in £10 shares. The first directors are W. Hewitt (chairman and managing director), J. Corner and J. Carless.

Thomas A. Aspden & Sons, Ltd.

Registered to acquire and take over as a going concern the business of timber and slate merchants and sawmill proprietors carried on by Thomas A. Aspden, Harry M. Aspden and William E. Aspden at Daisyfield Sawmills, Blackburn, Lancashire, under the style or firm of Thomas A. Aspden & Sons; to adopt an agreement with Thomas A. Aspden, Harry M. Apsden and William E. Apsden; and to carry on the business of timber merchants, sawyers, steam sawmill owners, importers and exporters of timber, slate merchants, dealers in stone, marble, bricks, cement, lime and builders' requisites, builders, contractors, carpenters, fitters, joiners, woodworkers, dealers in manufactured woodwork, quarry owners, house and property owners, &c. Capital £50,000 in £10 shares. The first directors are Thomas A. Aspden (chairman), Harry M. Apsden and William E. Apsden. Registered office: The Daisyfield Sawmills, Blackburn, Lancashire.

James Storer & Co., Ltd.

Registered to acquire and carry on the business of James Storer & Co., oil merchants and paint and colour manufacturers, Barrowfield Works, Bridgeton. Capital £15,000 in £1 shares. Registered office: 201, Reid Street, Glasgow. No initial public issue.

The Graham Properties Co., Ltd.

Registered to enter into any working or agency arrangement with the firm of William Graham & Co., merchants, Glasgow, and to carry on the business of a land and property investment company. Capital £100,000 in £10 shares. Registered office: 55, Cathedral Street, Glasgow.

Old and New London Securities, Ltd.

Registered to acquire land, house and other property upon any tenure, and to carry on the business of a land and development company, builders, contractors and decorators, and to make advances upon real or personal property. Capital £10,000 in £1 shares.

D. C. D. Syndicate, Ltd.

Registered to acquire any mines, mining rights, &c., in any part of the world, and to carry on the business of contractors, miners, smelters, coal and ironmasters, quarry owners, brickmakers, timber merchants, builders, merchants, &c. Capital £20,000 in £1 shares. Registered office: 56, Cannon Street, E.C.

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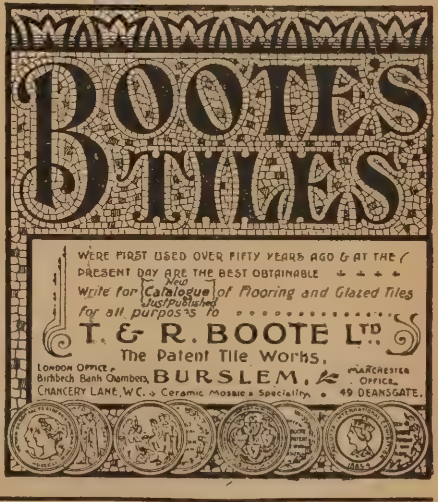

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		£ s. d.	£ s. d.
Beans	per qr.	1 12 0	—
Clover, best	per load	4 5 0	5 10 0
Hay, best	do.	5 0 0	5 10 0
Sainfoin mixture ..	do.	4 5 0	5 2 6
Straw	do.	1 8 0	1 18 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 8 0	1 9 2
Colza Oil, English ..	do.	1 8 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 6 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 $4\frac{1}{2}$	—
Linseed Oil, barrels ..	do.	1 9 $10\frac{1}{2}$	—
Petroleum, American ..	per gal.	0 0 $5\frac{3}{4}$	0 0 $5\frac{7}{8}$
Do. Russian ..	do.	0 0 $5\frac{1}{4}$	0 0 5^{3}
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	3 19 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 6 0	1 6 6
Tar, Stockholm	per barrel	1 4 6	—
Turpentine	per cwt.	1 6 6	1 6 9

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	82 0 0	83 0 0
Iron, Staffs., bar ..	do.	6 10 0	8 10 0
Iron Galvanised Corrugated sheet ..	do.	11 10 0	11 15 0
Lead, pig, Spanish ..	do.	11 18 9	12 0 0
Do. do. English common brands	do.	12 5 0	12 7 6
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12 15 0	—
Do. pipe	do.	13 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 15 0	—
Do. floor brads	do.	9 10 0	—
Steel, Staffs., Girders and Angles	per ton	6 12 6	7 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	114 15 0	115 5 0
Do. English ingots ..	do.	118 10 0	—
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	16 17 6	17 5 0

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SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec Yellow ..	do.	4 7 6	6 0 0
Do. Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 $10\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P.Std.	9 10 0	10 15 0
Do. do. 4th & 3rd	do.	7 0 0	10 15 0
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	21 0 0	—
Do. do. 2nd "	do.	19 0 0	—
Do. do. unsorted	do.	11 0 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	8 10 0	10 5 0
Do. White Sea ..	do.	11 15 0	13 15 0
Do. Quebec Pine, 1st ..	do.	13 15 0	—
Do. do. 2nd ..	do.	11 5 0	—
Do. do. 3rd &c.	do.	9 15 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	—
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	5 17 6	9 5 0
Flooring Boards, 1in. prepared, 1st ..	per square	0 11 6	0 13 6
Do. 2nd ..	do.	0 8 6	—
Do. 3rd &c. ..	do.	0 7 9	—

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0
Cedar, 1in., Cuba ..	per ft. sup.	0 0 $4\frac{5}{32}$	—
Do. Honduras ..	do.	0 0 $3\frac{3}{4}$	—
Do. Tobasco	do.	0 0 $3\frac{3}{4}$	—
Elm, Quebec	per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 $4\frac{7}{32}$	—
Do. African ..	do.	0 0 $3\frac{1}{8}$	—
Do. St. Domingo	do.	0 0 $6\frac{3}{8}$	—
Do. Tobasco ..	do.	0 0 $3\frac{29}{32}$	—
Do. Cuba ..	do.	0 0 $4\frac{29}{32}$	0 0 $3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3 15 0	5 7 6
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ..	do.	6 0 0	17 10 0
Wainscot, Riga (Baulk)	do.	3 15 0	5 15 0
Do. Odessa Crown	do.	3 15 0	5 15 0
Walnut, American ..	per cub. ft.	0 3 1	—

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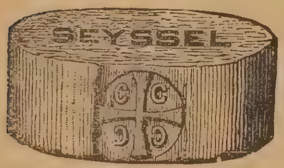

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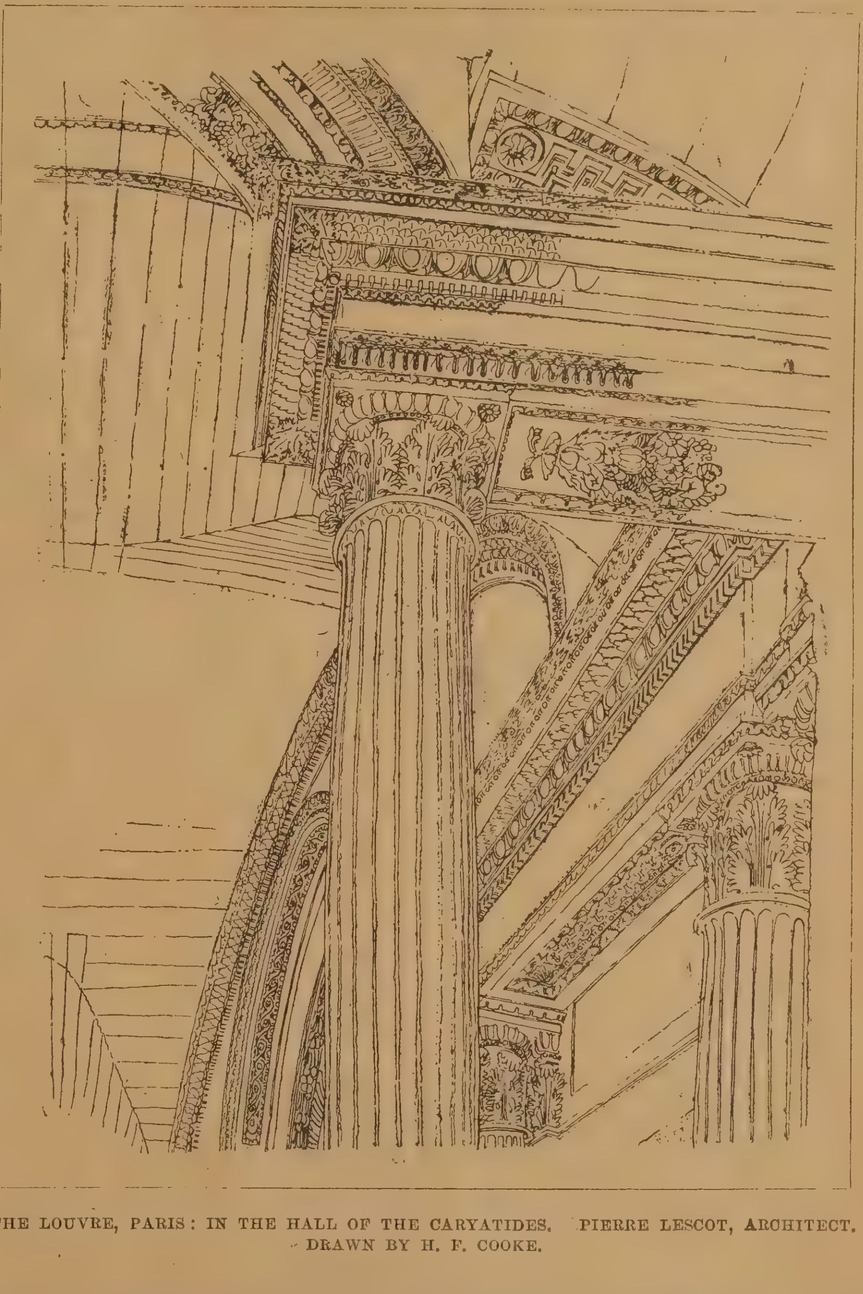
An Architectural Causerie.

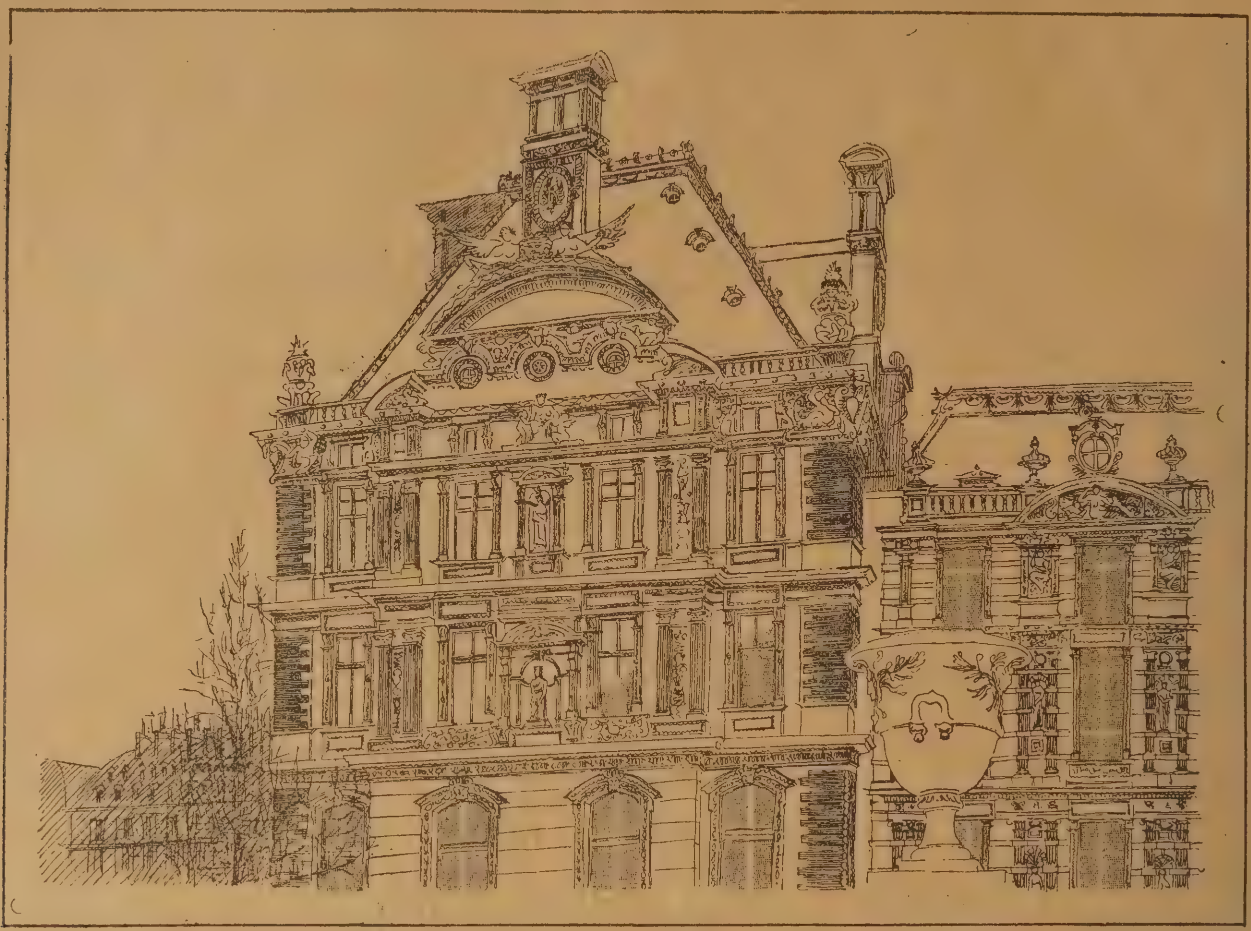
The Public Advertiser. THE Society for Checking the Abuses of Public Advertising, though doubtless unknown to the majority of people, is certainly working in a good cause ; moreover, their efforts are not in vain, for last session the clauses of the Dover Improvement Bill which gave the town council power over all forms of advertisements within their jurisdiction became law. The council, we are glad to learn, are making use of their new power, and soon those monstrous erections which have so long disfigured the bay will be removed ; and likewise the replica which destroyed the grace of Southampton Water has, at the insistence of the ground landlord, also been removed. There is no person who is so responsible for the destruction of all harmony in city streets as the advertiser, and anything which tends to check his abuses will surely have the support of all reasonable citizens. We certainly trust, with Mr. Richardson Evans, the hon. secretary of the above-named society, that every municipality which has to go to Parliament next year for powers will incorporate in their Bill the Edinburgh—or, better still, the Dover—clauses.

In the Land of the Mikado. THE Japanese are no less talented as artists than they are progressive in practical mechanics and commercial life. But it has been the constant statement of European and American collectors that since the country opened itself to Western knowledge and methods the quality of the art produced has greatly deteriorated ; yet, judging from the several exhibitions of Japanese artists which correspond to those organised in Bond Street and Piccadilly, the truth would appear to be exactly opposite. It is a fact that the products of the first years under the new régime were inferior, owing to the false conceptions of Western taste which the native artists adopted as a standard ; but since then all such perversions have disappeared and their place has been taken by works of merit—in some cases of greater merit than those of the pre-Western era. The Japanese saw the futility of pandering to public taste. They decided to educate it, with the result that their work has been steadily rising to higher levels. We have it on the most recent authority that in lacquer the Japanese are at least as great as they ever were, while in *cloisonné* enamel, in sculpture, in ceramics, and in metal-casting they have quite surpassed their predecessors. Sculpture affords remarkable proof of improvement. The inability of the old Japanese artists to produce an accurate sculpture of the human body was remarkable when it is remembered they were so skilful in rendering facial expression and drapery. Lack of scientific training was the inference, yet this was proved to be erroneous by an artisan and his successors—men of the commonest class—who began to sculpture wooden figures "as faultless anatomically as the works of Greek masters" (who themselves knew nothing of anatomy as we now know it, analytical surgery being then non-existent). The tiger as portrayed by the old Japanese masters had a magnificent skin, but a strange beast was inside it, for they had never seen a tiger. Western civilisation, however, with its circus, changed matters, and the tiger is now shown with realistic force. Everything goes to show that the Japanese artist of to-day is capable of producing work equal to the finest creations of his ancestors. As regards the architecture, it fails when measured by Western standards. We see, however, in the modern work the dominating influence of the American and European schools, and as an example we may direct attention to the new Imperial palace at Tokio illustrated in our issue for September 4th, a classic building following close after American, and consequently French, models.



THE LOUVRE, PARIS : IN THE HALL OF THE CARYATIDES. PIERRE LESCOT, ARCHITECT. DRAWN BY H. F. COOKE.

The London Building Act. THE London Building Act of 1894 extends to "London and no further," an expression which means the Administrative County of London ; but this does not include "the City," which comprises all parts now within the jurisdiction of the Corporation of London. Our reader are of course familiar with these facts, yet is it not surprising that the Act does not apply to the whole of London as generally understood ? It is evident that fires are likely to prove more disastrous in narrow streets than in wide ones, hence the by-law which requires a certain proportion to be observed between the height of the buildings and the width of the street ; but in the City there are no such restrictions, and the result is that tall blocks of buildings are crowded in narrow thoroughfares. The defect is obvious. It is to be hoped that in the future the Act will be so amended that new buildings and streets in the City are made conformable to the regulations which govern those in the rest of London.



THE NEW LOUVRE, PARIS: PAVILLON DE MARSAN. LEFUEL, ARCHITECT. DRAWN BY H. F. COOKE.

SOME PARIS SKETCHES.

THE following particulars are given in connection with the accompanying sketches by Mr. H. F. Cooke :—

Jules Hardouin Mansart, who was born at Paris in 1646 and died at Marly in 1708, was the grandson of the eminent architect Francois Mansart. His master was Libéral Bruant, who employed him in 1666 to conduct the works in progress at the Hotel de Vendôme. He was presented to King Louis XIV., and had the knack of pleasing the monarch, who asked him to submit a design for the Château de Clagny. The carrying out of this work was deferred, but in 1674 Mansart was entrusted with the enlargement of the Château de Saint-Germain, and a year later he received the distinction of being appointed Architect of the King's Buildings. The most important work of this architect was the Château de Versailles. He was engaged on its construction from 1678, but was unable to complete the work during his lifetime, the chapel (which is considered to be the finest portion) not being finished till 1710, after Mansart's death. The royal residence of St. Cyr was begun by him in 1685 and completed the following year, and almost within the same time this indefatigable architect began the remodelling of the Place Vendôme, the buildings on which were not altogether completed till 1698. The work which, with Versailles, has most contributed to Mansart's fame is the dome of the Invalides. As already mentioned, Mansart did not live to see the completion of his chapel at Versailles. This was entrusted to his brother-in-law, Robert de Cotte, whom he had trained and who had aided him on several occasions, especially in the reconstruction of the town hall at Lyons, which had been destroyed by fire in 1674. Robert de Cotte also executed, after the designs of Mansart, the high altar in the house of the Jesuits in Paris, and undertook the transformation of the choir of Notre Dame in accordance with the wish of Louis XIII.

Pierre Lescot was born in 1510 and died in 1578. His first work was the beautiful porch of St. Germain-l'Auxerrois in Paris, which Jean Goujon decorated with sculptures; this porch, however, was unfortunately destroyed in 1750. In collaboration with the same sculptor, Lescot constructed the famous fountain of the nymphs (called the Fountain of the Innocents) at the angle of the Rue aux Fers and the Rue St. Denis, but this fountain underwent great changes at the hands of other architects. Lescot was the inspirer of the Louvre. He commenced the western wing in 1546, and completed the Salle des Caryatides in 1548 and the south-west pavilion in 1556. The construction of the half of the southern wing took place between 1558 and 1564.

As regards the accompanying illustration of a portion of the Pavillon de Marsan, some particulars of the architect Lefuel will be found on page 22 of our issue for August 28th last.

A.A. BROWN BOOK.

THE Architectural Association Brown Book for the session 1901–1902 gives, in addition to the usual particulars, the full curriculum of the new day school. The following are the subjects set in the School of Design: Elementary class: stone carriage gateway, cost limited to £150; lead pedestal with bronze or brass sundial plate; mortuary chapel, cost limited to £200; small glass screen across a hall, 12ft. 6in. high by 8ft. wide, the cost limited to £30. Advanced class: small wooden bridge with stone piers and abutments; small country house, cost not to exceed 1s. per cub. ft.; Sunday school to accommodate 250 scholars; chancel screen in wood, 20ft. wide, gilt and decorated in colour, cost limited to £250. The subject for the Association silver medal is "A monumental fountain in a public garden 100ft. square, surrounded by a road 40ft. wide, into which four other roads lead, N., S., E. and W. Garden to fall 1 in 10 N. to S." The subject for the essay prize is "The life, work and influence of Robert Adam and his brothers."

The Committee is gratified to be able to report that the fifty-fourth session, which terminated on May 31st last, has been a prosperous one in every respect. The membership again shows a substantial increase, and financially the session has been a great improvement over previous years: 116 new members were elected, six were re-instated, and the losses by death, resignation, and other causes amounted to thirty-seven, the total membership on the last day of the session being 1,376.

The Royal Institute of British Architects has again generously contributed a grant of £100 towards the educational work of the Association. This has been of great assistance, for although the amount of students' fees exceeds the instructors' fees, rent and other expenses have to be provided for. The Premises Sub-Committee, after mature deliberation, has come to the conclusion that it is impossible to take advantage of any desirable building sites that may offer themselves until a substantial premises fund has been formed. It is therefore proposed to take steps towards this end. The office and library have been transferred to the front room on the ground floor, and the former office has been re-decorated and fitted up as a common room. This arrangement provides better accommodation for the office staff and library.

The Committee desires to place on record the names of those members who volunteered for service in the South African War, namely: Messrs. H. G. Bulman, J. S. Dunn. A. W. Earle, J. Haslam, C. H. R. Henman, W. S. Huxley, J. S. Lee, H. Passmore, P. Procter, F. N. Reckitt, J. B. Royle, C. Hodgkinson Smith, together with Messrs. W. F. Coombs (Artists' Corps), E. D. Ford (Imperial Yeomanry), and A. Lovejoy (South African Light Horse), who unfortunately succumbed to disease.

With regard to the educational work of the Association, 224 individual students attended the studio and evening classes. These numbers show an increase in Division I. The general accounts for the past session show an excess of income over expenditure of £517 odd.

New Board Schools at Leyton are to be erected in Farmers Road from designs by Mr. W. Jacques, architect, of Fencourt, E.C.

THE DECADENCE OF ARCHITECTURE IN BIRMINGHAM.

UNDER this title a correspondence has been started in the "Birmingham Gazette" by Mr. John Stratham Davis, who says:—

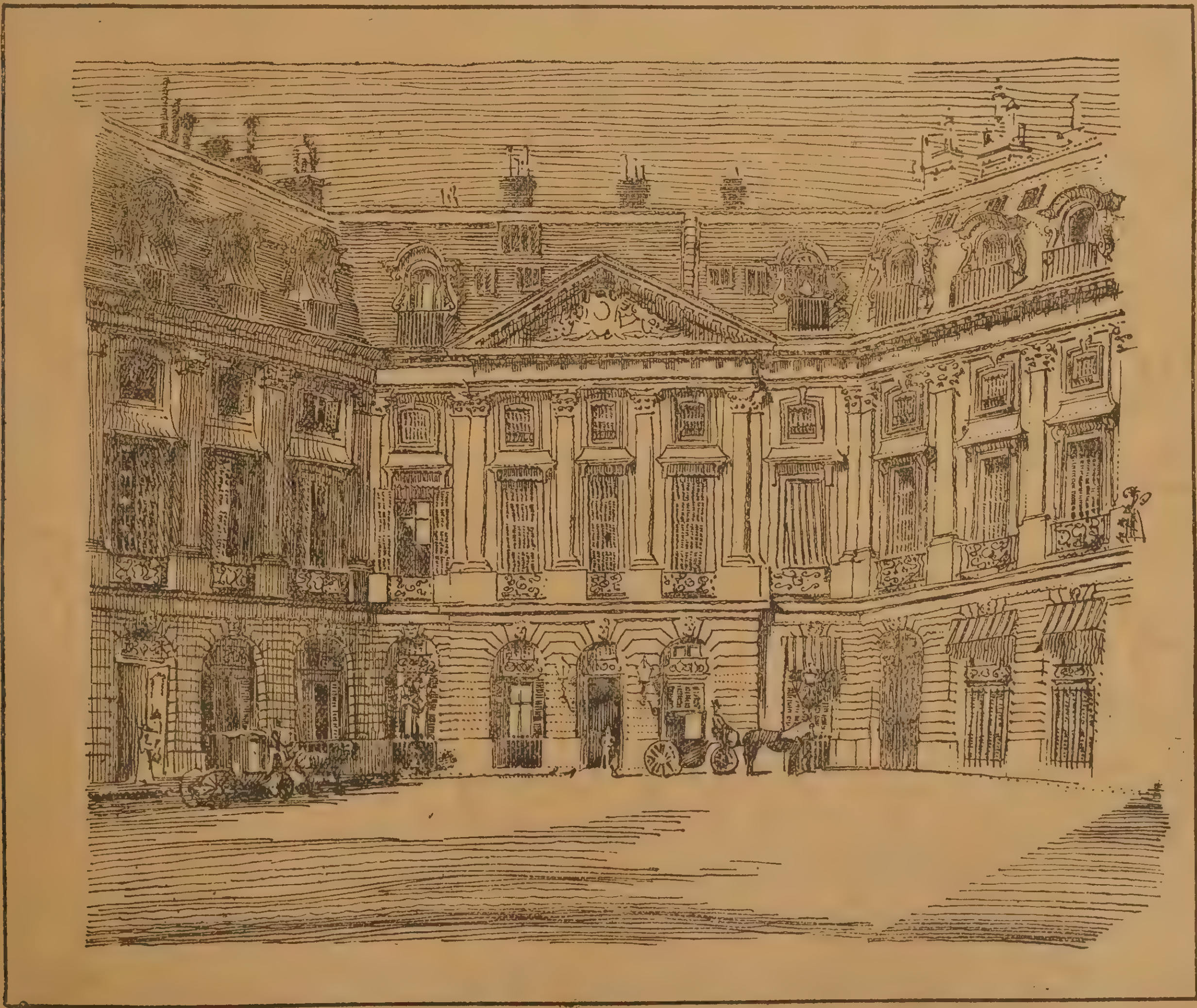
For some time past the idea has frequently occurred to me to offer a remark or two relative to the present state of architecture in this city, and I think the time is now ripe for such a purpose. For the last twenty or thirty years Birmingham has been demolishing and rebuilding at a furious rate; and now to all intents and purposes it may be denominated a new city—at least the central portion. Among the hundreds of new erections planned and designed by different minds, it would be unreasonable to expect that these structures should be of uniform excellence. Some few are really beautiful in nearly every architectural feature, *e.g.*, the Mason College, and (former) Liberal Club adjoining the School of Art, the Cobden Hotel, the Louvre, the Victoria Courts (an exceedingly fine building, though perhaps somewhat overcrowded with ornamentation), the charming shop buildings in Corporation Street erected for Messrs. Liberty, the noble premises in Bromsgrove Street occupied by Messrs. Hawkes, that most lovely building the Corporation Baths in Monument Road, and perhaps a few others. In these buildings, although the style adopted is mainly Gothic, yet the architectural treatment is exceedingly diversified. There is no slavish copying of the antique; all modern improvements in construction, &c., have been incorporated: in fact, speaking broadly, these buildings are what the old Gothic architects would have designed had they lived in our own times.

But the majority of our new Birmingham erections, those in Corporation Street and Colmore Row in particular, are of very peculiar style (or styles), and of course their merits must be judged from a peculiar standpoint. Some are merely commonplace—they do not greatly offend the eye of the observer; they are simply colourless; they excite neither feelings of admiration nor contempt. Their makers have partly studied the "Glorious Five Orders," and have lost the book. A goodly number of our new buildings in the localities just mentioned are, if possible, still poorer in design than the foregoing, but to compensate for this deficiency they are well "plastered over" with an abundance of scroll-work, leaves, flowers, heads, fret-work, and a variety of other embellishments of the most bizarre and absurd kind, so that the beholder is struck with astonishment if not with awe. To speak candidly, such buildings have not a trace of real architecture in them. They evince neither thought nor feeling for art. The money must be spent somehow, their makers argue; and how can it be more judiciously expended than by "piling up the agony" with this vast amount of ridiculous ornamentation? We want our buildings to show "brains" as well as mere money value.

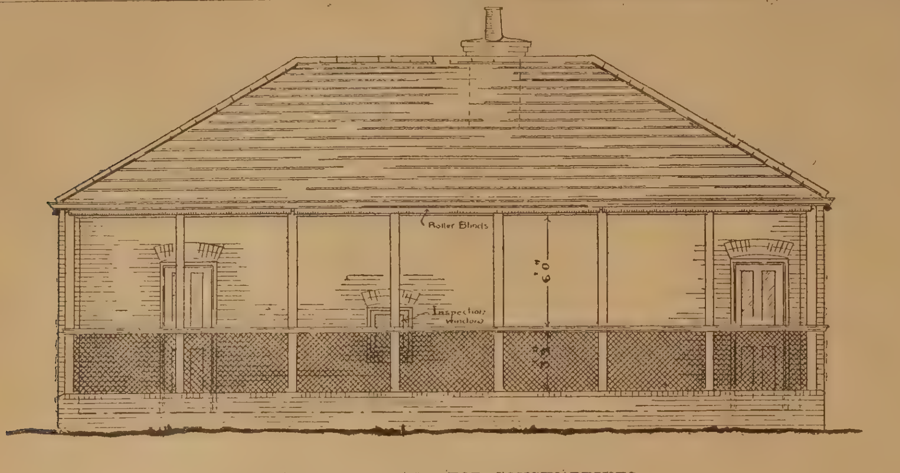
I regret to say that the architectural profession is fast degenerating into a mere money-making trade. This of itself must surely blight the art feelings of our nature. The general public, I fear, too often value the architect only for the quantity of work he can "turn out." The quality of that work is of mere secondary value. In this age of scientific improvement and discovery it may be quite possible to invent some mechanical contrivance that will obviate the necessity of any expenditure of brain-power on the part of the architect. He may either turn a handle or put a penny in the slot, and lo! the design for a new building is in his hand. But, speaking seriously, I am fully convinced that we cannot possibly put too much "thought" into our buildings if we wish them to live. We must not design them haphazard, and think that because they are highly ornamental they are also architectural. Some very beautiful buildings indeed have been designed with scarcely an ornamental feature upon them.

A BLOCK OF 900 OFFICES.

ONE of the largest of the new edifices which have been erected in connection with the widening of London Wall from 45ft. to 50ft. is Salisbury House. It covers almost an acre of ground, and possesses a superficial area of 50,000ft. Its frontages total some 800ft., made up as follows: London Wall, 300ft., Finsbury Circus, 300ft., Circus Place, 100ft., and West Street, 70ft. The building will be finished by the end of the year, and at the present rate of the letting every one of its offices will be occupied by then. The site was let by public auction in October, 1898, to Mr. Ludwig Neumann at the huge ground rent of £17,000 per annum, an income which goes to the Bridge House Estates Committee. The architects are Messrs. Davis & Emanuel, of 2, Finsbury Circus, and the design is French Renaissance in character. The building comprises eleven storeys, which give accommodation for over 900 offices. These again are sub-divided into suites ranging from one to twenty-five rooms. The frontage to London Wall is devoted to shops. The building is entirely faced with stone. The main feature of the edifice lies in the ample provision which has been made for light and air. Large areas are provided to give ample light, and every office is faced with ivory white glazed bricks. The electric mains throughout the house have been installed by Messrs. Strode & Co., Osnaburgh Street, under the supervision of Mr. Charles E. Skelton, A.M.I.E.E., consulting engineer, 1, Finsbury Circus. The various floors are reached by seven passenger lifts and four staircases. There are about seventy strong-rooms, very carefully designed; a number of spacious halls for the meetings of companies, a luncheon-room, a newspaper agency, a public telephone call-office, and, in fact, everything that appeals to a commercial man and facilitates the conduct of his business.



NORTH-EAST ANGLE OF THE PLACE VENDÔME, PARIS. J. H. MANSART, ARCHITECT. DRAWN BY H. F. COOKE.



ELEVATION OF WARD FOR CONSUMPTIVES.

SANATORIA FOR CONSUMPTIVES.

By ALBERT C. FREEMAN.

THE disease of tuberculosis, which is spreading so rapidly in this country, is not only receiving the attention of all medical authorities but the Government has (not before time) appointed a Royal Commission to thoroughly investigate the theories of Dr. Koch, so as to ascertain whether or not this disease is inherited, or transmitted from animals.

Sanatoria are being erected by various hospitals to cope with infected cases, and the form of treatment adopted is what is known as "the open-air cure."

The arrangement and construction of the wards for this disease differ materially from ordinary sick wards; the patients are being placed in a ward quite open to the air, with practically no protection from the weather. Medical authorities contend that this is the best form of treatment, and so far the results have been most satisfactory. The change of air being so frequent, the patients' lungs are hardened and strengthened.

I visited the North London Hospital for Consumption, where the open-air treatment is in general use, and was agreeably surprised to find how well the patients looked after going under the extreme trial. In this hospital wooden structures have been erected at the rear of the existing buildings, the same having a due south aspect; and, in addition, the balconies which lead off the wards are also used for the same treatment, two beds being placed in each balcony, one at each end. The windows of the ordinary wards are always kept wide open top and bottom so as to secure a constant change of air. This building can hardly be taken as a good example, as it is an old one which has been converted into a consumption hospital; but it gives a general idea of what should constitute a consumption sanatorium.

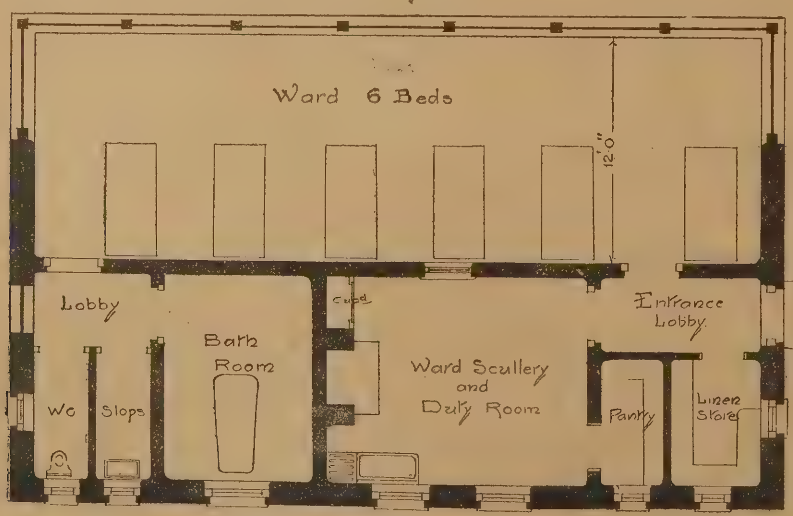
When erecting these sanatoria the main points to be borne in mind are the character of the soil and the selection of a suitable elevated site. The site should be in the open country or by the sea-side, and be of a clean, porous and dry soil, having free circulation of air around it, and, if possible, sheltered from the north and east. The pavilions should be scattered about the site, having in all cases a south-west aspect for the wards, and sheltered from the north winds. The pavilions may be erected with one or more floors, to suit the required accommodation. It is not advisable to place a large number of patients in one ward; from six to ten will be found most satisfactory.

Each ward should provide about 72 super. ft. and 750 cub. ft. per patient.

When constructing the ward, it is most essential for the ends to be enclosed sufficiently to guard against draughts descending on the patients lying in the end beds. The remaining portion of the ends and the front of the wards should be left quite open to the air, as shown in the accompanying illustrations. The lower portion of the framing should have a handrail, and be fitted with either galvanised wire or iron railing about 3ft. 3in. high. A dwarf wall should be built around the verandah, standing about 9in. to 12in. above the floor. The floor should be constructed of concrete with tile facing or other hard substance, and have a channel in it to carry off any water which may drive in during wet weather. Outlets should be made in the channels, and wastes taken from them to discharge over trapped gulleys outside. No gulley or other trap should be fixed inside these wards, as the trap is liable to get unsealed and cause foul gases to arise, which would be disastrous to the patients.

On the outside of these verandahs are fixed canvas blinds, with suitable fastenings in the sill for holding them in position when drawn down. These blinds are used during inclement weather, to protect the patients from the driving rain.

The inside walls of the ward should have glazed brick dadoes, and the upper part finished with a pointed brick face, and the ceiling plastered. It is needless to say all angles should be rounded off for cleanliness. The bath and lavatory accommodation should be in the same proportion as an ordinary sick ward, and planned with a disconnecting lobby for through ventilation. No heating of any description is provided in the wards. When the temperature becomes so low as to affect a patient, he or she is removed to another ward where the temperature may be slightly higher.



PLAN OF WARD FOR CONSUMPTIVES.

A nurses' duty-room or ward scullery should be provided in connection with every ward, situated with easy access to the ward, and having an inspection window to overlook the ward. This room should be fitted with a small cooking-range, and a sink for washing up and cleaning the ward utensils should be provided (but not for slops). It should have hot and cold water laid on, with taps affording a full supply.

There should be provided in connection with the scullery a pantry or larder for keeping the necessary provisions, such as milk, &c.; also a store for towels, sheets, &c.

The general administration building should provide all that is necessary for the treatment and discharge of patients, and the general supervision, and accommodation for staff. A general recreation- and mess-room for the use of such patients who are able to leave the wards should be provided, also stores for the patients' own clothing, which should be disinfected before being stored. There should also be a room (fitted with the necessary apparatus) for the linen and clothing which requires to be disinfected.

Although consumption is not really infectious it is in these institutes treated to a great extent as an infectious disease.

NEW EDINBURGH BOARD SCHOOLS.

TWO new Board schools have recently been opened in Edinburgh, named the Flora Stevenson School at Comely Bank and the Parson's Green School, adjoining the King's Park. These new schools, which have been modelled on almost exactly the same lines, have been constructed on up-to-date principles, and the children who attend there will be taught under most favourable conditions as regards good light, plenty of fresh air and healthy situation. There are open spaces all round both establishments, and from Parson's Green School, which stands very high, a splendid view can be obtained of the park on one side and the Forth and the coast of Fife on another. This school has accommodation for about 1,450 scholars, and that at Comely Bank for some fifty or so less. The new schools are large and solid-looking buildings, with somewhat plain exteriors. The fittings and furnishings are of the latest and most improved types. There is a large central hall, with two galleries, and it is from this hall and these galleries that entrance is obtained to the classrooms, admission to the upper flats being got from wide staircases at each end. The whole of the ground floor will be occupied by the infant department, and the upper flats will be set apart for the seniors and juniors. In addition to the ordinary classrooms, there is a combined workshop and cookery classroom and a gymnasium on the top floor. The centre of the roof is covered with glass, and a good light is thereby obtained. Large rooms have been set apart for the gymnasiums at both schools. Both schools are lighted with electricity, ventilation is obtained from fans driven by electric motors, and the heating is done by hot-water pipes. Among the other alterations carried through has been the building of a new infant department in connection with the North Canongate School. It also has a large central hall, with classrooms entering from it.

Govan Public Baths, which have been erected at the corner of Church Street and Summertown Road by the Govan Town Council, were opened recently. Both the ladies' and the gentlemen's swimming ponds are of the regulation size, 75ft. by 35ft., the former having a depth of from 2ft. 6in. to 4ft. 4in., and the latter from 4ft. 3in. to 7ft. 3in., with a diving ladder 13ft. high at the deep end. The scheme involves a capital expenditure of between £24,000 and £25,000.

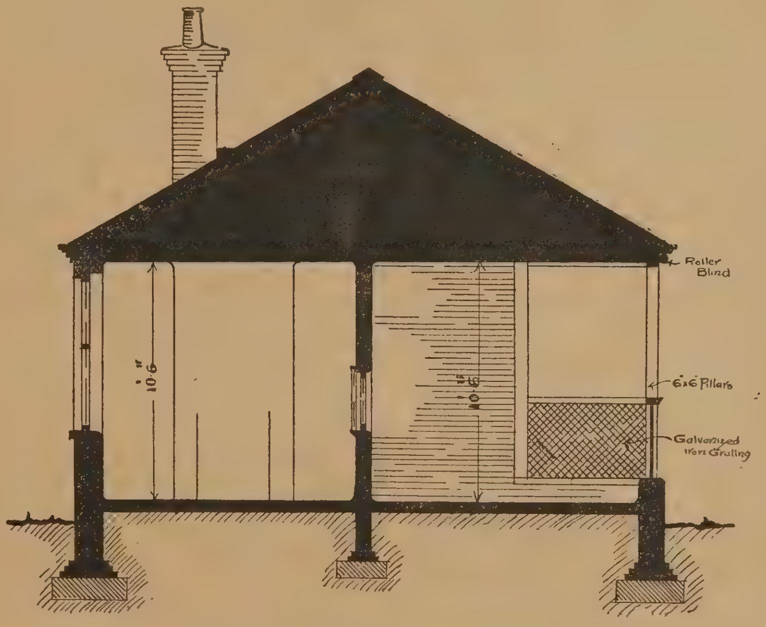
LIVERPOOL'S NEW TECHNICAL SCHOOL AND MUSEUM.

"THE finest site in England" is a description frequently applied to that portion of Liverpool of which St. George's Hall is the centre, and when the whole scheme of improvement decided upon by the Corporation is completed it will be still further bettered. The whole facade of the buildings in William Brown Street is striking. Including the Walker Art Gallery, the Rotunda Reading-Room and Lecture Hall, and the Brown Library and Museum, besides the County Sessions House, there is a frontage of public buildings which extends roughly for 850ft., and if we include the Byrom Street front of the Technical School the figure will be about 1,040ft., or nearly one-fifth of a mile. The area covered by this range of buildings is approximately no less than 17,409 sq. yds.

Not the least important feature of this architectural combination has just been completed by the erection of the building which terminates the Classic pile fronting William Brown Street—the new School of Science, Technology, and Art and Museum extension. Mr. E. W. Mountford, F.R.I.B.A., is the architect, having gained the award in open competition. The space is unduly cramped by the demands of an adjacent firm of tradespeople, while the curving line of the street added to the awkwardness of the site. The problem was got over in various ways, chiefly unsatisfactory and some of them impossible, by the other competitors, but Mr. Mountford curved his frontage in a bold arc, thus solving the difficulty, and adding to the building a striking feature.

The new school is described as of the modern nineteenth-century Classic style, and is built of Stancliffe stone, from the same quarry, in fact, as that which supplied the material for St. George's Hall. The boldly-curving front in Byrom Street is the chief elevation, and here is situated the large and imposing main entrance. The strongly-marked external features of this front indicate the interior divisions and arrangements, for the lower portion, with its numerous windows and rusticated base, form the technical school, while the columnated portion above, with the sixteen Ionic columns and broad balustraded windows, is devoted to the purposes of the museum. The main entrance is approached by two flights of steps leading to a broad and ample landing. The steps are flanked by a circular balustrade, terminating on either side in large pedestal piers, upon which will be erected large bronze lamps, to be fitted with the electric light. From either side of the entrance rise heavy columns supporting a pediment bearing statues of heroic size. These statues are from the studio of Mr. Pomeroy, who has executed the whole of the sculpture which adorns the building. The figures over the entrance hall represent Art holding up the mirror to Nature and caressing the famed anatomical study by Michael Angelo, and Science, veiled, and with a crucible. Immediately above the main entrance pediment, and extending along the whole front, rise sixteen Ionic columns with carved capitals and volutes, these supporting a richly-decorated cornice, which is surmounted by the balustrade above. The large columns, over 30ft. high, harmonise with those of the other buildings in William Brown Street, and are practically upon the same level. This seems curious in view of their height above the street level, but so great is the fall of the roadway between the entrance to the present museum on the plateau and Byrom Street that the bases of these columns are actually 2ft. above the columns on the plateau. The features of the William Brown Street frontage are the bold projecting bays, with their deep vaulted arches enriched with simple decoration, and surmounted in the pediments by groups of statuary. The character of the Byrom Street front is reproduced in the marking of the divisions of the building; the lower portion coinciding in design, while from the Museum level there rise square pilasters supporting the main cornice and pediments. In the groups of figures occupying the pediments Mr. Pomeroy has sought to represent by allegory the prevailing spirit of the city. Minerva, as representing the wisdom of the city, with shield and spear, protects and presides over the education of the community. On one hand is the bearded figure of an old man instructing an eager boy in the mysteries of science, and on the other a young mother is carefully directing the thoughts of her child to some sheep, typifying the agricultural interest. The second pediment contains another group, of which the principal is a seated figure holding a globe and sceptre, representing Liverpool, this being supported on either side by female figures typical of commercial life and industrial occupations. The sculptured figures on the pediments of the arches represent Astronomy, Navigation, Geography and Agriculture.

In the interior of the building the entrance hall requires first mention. Passing through the oak screen which surrounds the interior doorway, the visitor finds himself in a lofty vestibule. This is surrounded by a dado of oak, and the same material lines the hall. Fluted oak columns with carved capitals support the cornice, and from this spring the arches supporting the high-domed ceiling. When illuminated an effect is secured in the dome by vitreous mosaic in shaded blue tints, sprinkled with dots of gold, thus imitating the appearance of a starry sky. Tinted panels modelled in low relief adorn the spaces between the arches. Beyond this vestibule is the lofty cool hall, with black and white marble-tiled floor and massive columns of brilliant red-veined Devonshire marble, supporting a superstructure adorned by Mr. Pomeroy. Panels illustrate the rise of shipbuilding, and the marble fireplace, which forms a feature of the hall, is surmounted by a representation in relief of the city crest. Broad corridors branching right and left of the entrance give easy and immediate access to every room on the various floors, while two spacious and well-lighted staircases on the side passages establish ready communication between them. The corridors, staircases and all the classrooms and workshops throughout the building are well lighted. The light for the internal elevations is obtained from a large courtyard on the east side of the building and two smaller ones in the centre, which are all faced with white-glazed bricks. The ground-floor corridor on the entrance side, which is lined with bird's-eye marble from Derbyshire, has a semicircular vaulted and panelled ceiling, and the deep windows are filled with leaded lights containing shields with scrolls recording the names of the chairmen of the Building and Technical Instruction Committees. Immediately opposite the entrance are the swing doors of the large lecture-hall, a chamber of simple design. The floor is of polished oak, and the walls are lined with a high dado of light canarywood in its natural colour. From this dado spring the outline of the ribs supporting the vaulting ceiling, in which are placed large circular windows. At the north end is a raised platform, above which appears an elaborate panel designed by Mr. Pomeroy and representing a group of students receiving awards from the hands of the presiding genius of education. An adjacent corridor gives access to the committee-room, a spacious apartment. The room is lined with a panelled dado painted a dead or "flatted" white, and fluted columns with carved Ionic capitals support the panelled ceiling, with its large encircling wreath of modelled fruit. The floor is of polished oak, and the mantelpiece is formed of Irish green marble and red-veined alabaster. There is a niche in the mantelpiece in which Mr. Pomeroy's bronze bust of the late Queen Victoria will be placed.



SECTION OF WARD FOR CONSUMPTIVES.

The aim throughout has been, so far as was compatible with cost and the limits of decoration in a building devoted to classrooms, workshops, and the like, to use work not only of good design but such as would appeal to the students as meritorious specimens of handicraft and technical ability. In the metalwork, for instance, the handsome dog-iron antique stoves in the committee-room and in the vestibule are fashioned entirely in wrought and hammered ironwork by Mr. Nelson Dawson. They are fine specimens of handicraft, and the same may be said for the electroliers of repoussé work which appear in the vestibule and elsewhere. The wrought-iron entrance gates were made by Singers, of Frome, while those at the Byrom Street side entrance are from the Bromsgrove Guild of Arts and Crafts, Messrs. Ramsden & Carr supplying the wrought metalwork at the archways. Mr. Worrall, of Dale Street, Liverpool, has contributed other examples, and the Della Robbia Company have supplied the lining tiles to the handsome fireplaces of the entrance hall and committee room. The entrance, vestibule and ground-floor corridors have been floored in marble to the architect's design by Norbury & Patterson, of Edgehill; while the bird's-eye marble wall linings are from the picturesquely situated Ashford Works. Torquay quarries supplied the richly-veined Devonshire marble columns which form so striking an addition to the vestibule. With regard to the general corridors, a restful green is the prevailing tint, and with the joinery in the same colour an agreeable and welcome change is made from the conventional and time-honoured brown tint. The arrangement of the rooms of the Technical School has already been described in a former article; and it is only necessary to add that the fitting up of the chemical, electrical and engineering laboratories, the class- and workrooms, and executive offices has been done by Messrs. Brown & Backhouse from detailed instructions supplied by Mr. W. Oulton, the chairman of the Technical Instruction Committee, and Mr. Hewitt, the director.

It must not be forgotten that the building serves two entirely separate and distinct purposes, one being the provision of space for technical instruction and the other for extending the museum. The museum occupies the upper portion of the building, and entrance to it is only gained from the existing museum premises, which are upon the same level. The addition consists of two immense U-shaped galleries running without interruption the entire circuit of the building, and forming perhaps the finest museum galleries in England. The lower gallery, of over 400ft. in length and 34ft. wide, has a flat roof, and is lighted by large windows in the inner and outer walls. Lined all in white plaster, it is a bright, airy, and spacious apartment, but in this respect is surpassed by the upper gallery. Bold semicircular arched ribs, finely moulded, spring from the side piers to support a roof which is a long dome with skylights running the entire length of the gallery, The museum extension has given opportunity for several structural alterations and improvements. Provision has of course been made for the offices of Dr. Forbes, the curator, and in addition the lending library has been much increased in size. More book-storing space has been provided, and better accommodation supplied for the staff. In the museum itself the most noticeable change is a rearrangement of the turnstiles and umbrella-room and the provision of a mahogany screen door at the entrance to the hall. Arched connections have also been made between the hall and the Meyer Museum, and other structural improvements greatly facilitate communication between the various galleries.

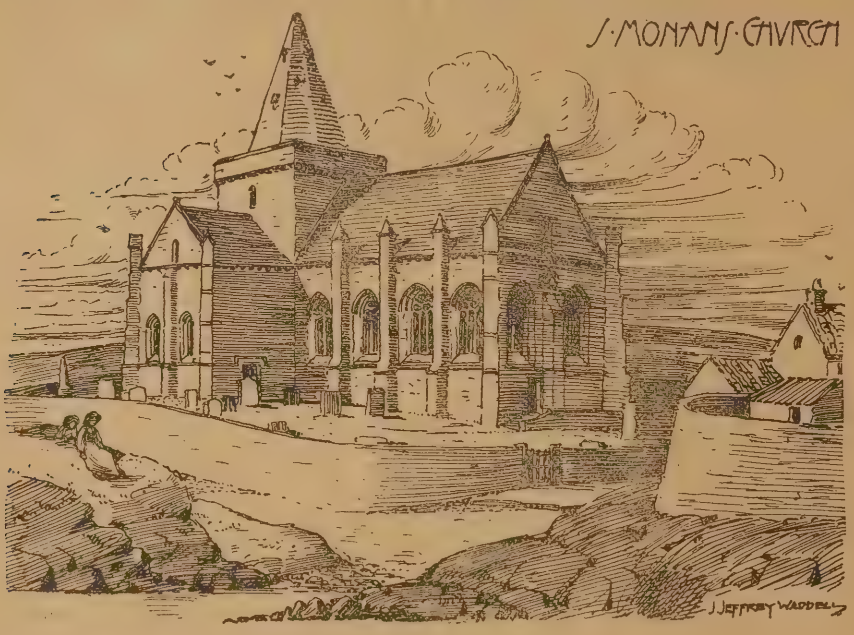
The heating and ventilation is on the "Plenum" system, which has been installed by Mr. William Key, of Glasgow and London. Mr. Scales was clerk of works.

The general contractors for the building were Messrs. Henshaw & Sons, and under them are Messrs. Patterson for joinery, Mr. Kirkland for iron- and steel-work, Mr. Lea for plumbing and painting, and Messrs. Tanner for plastering. Charteris & Longley's patent has been used in the wood-block floors.

Mr. T. W. Pomeroy, from whose studio the whole of the statues and modelled panels which adorn the buildings have come, gained in 1886 the gold medal and the travelling studentship of the Royal Academy. He has been a frequent exhibitor at the Academy and most of the art galleries of Europe and America. Among the work he has designed and executed should be mentioned the statue of William Ewart Gladstone in the Lobby of the House of Commons, and the centenary statue of Robert Burns at Paisley, besides statues of Oliver Cromwell at St. Ives and Robert Blake at Bridgnorth. His latest production is a bust of the late Bishop Ryle.

ST. MONANS CHURCH, FIFESHIRE, N.B.

BY J. JEFFREY WADDELL.



ST. MONANS is one of the most picturesque of the numerous fishing villages that are dotted all along the Fifeshire shore of the Firth of Forth. It is a favourite haunt of artists both from the east and west of Scotland, and hardly an exhibition is held which cannot boast of one or two views of this picturesque spot. But while the village with its fishing and boatbuilding is full of picturesque "bits," it owes much of its charm to the fine old church which, rising up from its midst, fitly crowns and completes the picture.

The church is situated on the rocks close to the sea and near a small stream. As might easily be imagined, it has suffered much from the violence of the weather. Last year it had reached such a state of disrepair that it became necessary, if it was still to be used as a place of worship, that the church should be re-roofed. Apart from the fact that the roof was not weatherproof, a considerable thrust (due to the imperfect tying of the timbers) was being exerted on the walls, tending to throw them out, and endangering the stability of the vaulting.

Mr. Baird, of Elie, offered to restore the church, and Mr. P. Macgregor Chalmers was appointed architect of the work. He has had to contend against a lot of prejudice, many being in favour of letting the church go to ruin rather than risk spoiling its present picturesque appearance. The old roof was certainly of a very harmonious colour, but after all this was not the original roof, being only about seventy years old—and a roof that admits seagulls into a church is hardly worthy of the name. The new roof is of large slabs of Caithness paving, which have a pleasant colour and should weather and wear well. The whole is crowned with a stone ridge.

The church and village derive their name from St. Monan, who, according to tradition, suffered martyrdom at the hands of the Danes on the Isle of May, off the coast of Fife, in the eighth century. He is said to have been buried on the site of the present church. In 1362 David II., in gratitude to St. Monan, commenced the larger church which we see to-day. James III. bestowed it on the Dominicans, since which time it has endured a chequered career, but still remains fairly well preserved.

It consists of a chancel 50ft. long by 23ft. inside, and transepts, with a tower and spire over the crossing. The nave, though evidently intended, has never been built.

The chancel is divided into four bays, marked externally by buttresses with Scotch terminations and having traceried windows between them. The east-end and south transept have each two traceried windows with a buttress between. In the south wall of the chancel there is a fine sedilia and piscina. A turret stair in the north-west angle of the crossing leads to the tower which rises a short distance above the ridge, is terminated by a parapet supported on corbels, similar to those at the eaves, and is capped by a squat octagonal spire having lucarnes, but much weather-worn and without a finial.

To the north of the chancel there was a modern vestry which occupied the position of the ancient sacristy. Mr. Chalmers has had the modern structure removed, and has fortunately come upon the foundations of the ancient sacristy, which will as far as possible be restored to its original condition.

THE RURAL DRAINAGE PROBLEM.

A MOST important question is raised by Mr. L. A. Lucas, M.A., in a letter to the "Times"—that of the drainage of our country parishes.

This is entirely a new thing, for until the last few years the idea was never heard of. Now the Local Government Board is taking the matter in hand, and is asking the different parishes what they intend to do with regard to the matter. Mr. Lucas suggests that the drainage problem is contained in these two questions: (1) At what point in the growth or development of a parish does a drainage system become necessary? (2) Granted that the parish has developed sufficiently for a drainage system, what kind shall be adopted—drainage by sewer (as in towns), or drainage by vans, known as the Bexley system?

He asserts that the solution of these two puzzling questions is the solution of the whole matter. "With regard to the first question, it is quite certain that a purely agricultural parish would not require to be drained. The squire's mansion, the farmer's house, and the labourer's cottage never caused the question of drainage to be mooted. Each was able to manage its own sanitary affairs. The difficulty starts as soon as houses begin to be built which are without sufficient land to accommodate their own sanitary requirements. A couple of such houses, however loudly they called upon the parish council for sanitary assistance, would certainly not be allowed to plunge the whole of the parish into the expense of a drainage scheme. Would twenty houses be allowed to? Now we are in the very heart of the rural drainage difficulty. What is to be done if a couple of thousand people in a parish do not need drainage and strongly object to it, while twenty or even 200 do need it? The parish in which I live illustrates this state of things. Nearly all the inhabitants of this large agricultural parish are strongly opposed to the introduction of any drainage scheme, while about eight or ten newly-built houses have need of one. I leave it to the judgment of your readers as to whether the whole parish should be burdened with a rate or as to whether those houses requiring sanitary assistance should bear the expense themselves.

"Then as to the second question. Having decided to drain the parish, is it best to adopt the usual drainage by sewer-pipes or the system of sanitary vans, which make a tour of all the cesspools in the parish? I will not labour this point. Experience has shown that once drainage has been resolved upon it is better to drain the place by the ordinary sewer-pipes in use in every town—unless the parish be a very scattered one, in which event sewer drainage would be too expensive, as well as being impracticable, and recourse must be had to the sanitary vans until the population increases and the parish becomes more compact. But the real difficulty of the whole matter lies in the first question: When is a parish to be considered sufficiently developed, or built over, to be compelled to drain itself?"

Change of Address.—Mr. Henry Rose, architect and designer, late of 3, Staple Inn, Holborn, E.C., has just opened an office in Holy Rood Street, Chard, where he will continue to supply designs and estimates for hand-made furniture, &c., and to carry out architects' designs locally by skilful craftsmen.

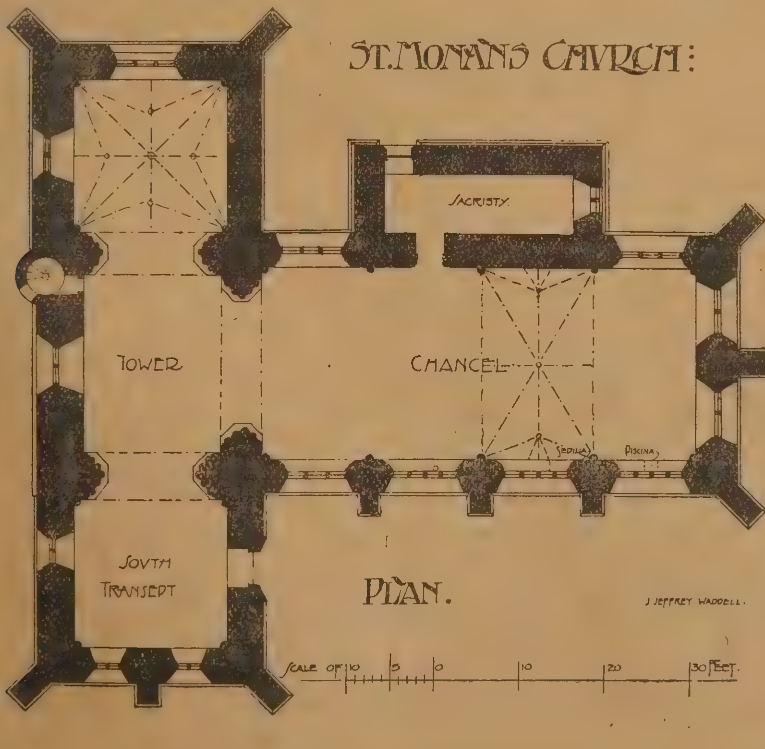
PLYMOUTH'S NEW THEATRE.

A NEW theatre in Plymouth, to be called "The Gaiety," is to be erected. Mr. H. J. Snell, architect, has prepared the plans and specifications, which have been passed by the Special Works Committee of the Corporation without alteration.

Occupying nearly half of the present vacant space, the site has a frontage of 150ft. in Tavistock Road and 124ft. in Tavistock Place, with an average depth of 112ft. It immediately adjoins the lower block of buildings already erected, and directly faces the Technical Schools in Tavistock Road. The new theatre will run longitudinally to the site and parallel with Tavistock Road, the stage being at the north end and the auditorium at the south. Every part of the house appropriated for the audience will have two separate entrances and exits, one opening into the Tavistock Road and the other into Tavistock Place. The main entrance to the dress circle will be at the south-west end in Tavistock Road. Sheltered by a verandah projecting over the footpath, it will have three large openings into a vestibule leading by a grand staircase to the foyer. Both the second circle and pit-stall entrances will be through arcades adjoining the grand circle entrance in Tavistock Road, while the pit and gallery will be entered from Tavistock Place. Seating accommodation will be provided in the pit for 450 persons and in the pit stalls for 330. Each part of the house will have separate retiring-rooms for ladies as well as for gentlemen, and will also have a separate refreshment-room. On the ground floor will be two refreshment-rooms, one at the back of the pit for that part of the house and the other at the side for the pit stalls. The foyer will be an apartment 30ft. by 20ft., separated by large glass doors from a landing of almost equal dimensions. From the foyer there will be three large openings into the grand-circle corridor. Besides the proscenium box, there will be two others at each end of the grand circle. Including these boxes, the grand circle will seat about 176 persons. It is intended to close the grand circle in at the back. The refreshment-room in the south-west corner will be separated from the landing by three pairs of glass doors. In the second circle there will be eight rows of seats and two proscenium boxes, capable of seating altogether 328 persons. Only a low barricade will divide the second circle from the corridor, thus leaving space for a promenade. The refreshment-bar of the second circle will be directly over the foyer, and of the same length but narrower. With ten rows of seats the gallery will seat about 500. In all the theatre will have seating accommodation for about 1,800 persons. Like the rest of the house the gallery will have its own refreshment-room. All the exits from the building will be in excess of the requirements laid down by the London County Council for the Metropolitan theatres.

To enable the audience in all parts of the house to obtain a clear view of the stage, the floor of the pit stalls and pit will be made sloping, with a rise of 6ft. 4in. from the front of the former to the back of the latter, while the second circle will recede two rows behind the dress circle, and the gallery two rows behind the upper circle. Ventilation will be secured by three shafts running up through the roof. The stage will be 60ft. wide, with an average depth of 46ft. from the curtain—practically the same dimensions as the stage of the Theatre Royal. On the east side adjoining the stage will be the scene dock, with entrance for scenery from Tavistock Place. Like the different parts of the auditorium, the stage end of the house will have separate exits for actors and the staff. On the ground floor there will be the manager's private room, business office, waiting-room and three dressing-rooms. Above these will be three other dressing-rooms, with a large dressing-room for female chorus on one side of the house and a wardrobe on the other. On the next storey will be another set of three dressing-rooms, with a large dressing-room for the male chorus. At the back of the stage on this level will be the fly galleries. On the basement under the stage there will be a large house for a gas-engine and a limelight-room. Internally the building will be constructed on the cantilever principle, and within the lines of the seating there will be no pillars to obstruct the view. All the staircases will be fireproof, being built of concrete or stone, while all the openings in the walls between the working part and the auditorium will be fitted with iron doors, and the stage shut off from the rest of the house by a water curtain. Electricity will be used to light the building, with gas as an auxiliary.

The front elevation will be in the modern Renaissance style. Resting on a course of limestone, the main front will be of red bricks with Ham Hill stone dressings, harmonising with the new buildings already erected in Tavistock Road. The centre front elevation will be composed of two wings and lateral pavilions. Both the wings and centre will be recessed, and in the recesses balconies will be placed. In the centre a gable will be flanked by two circular turrets, and each of the pavilions ornamented on the top with a semicircular pediment, surmounted by a dome. At the special request of the Council the front in Tavistock Place will correspond in general character to the elevation of the present houses. The scheme of the decoration has not yet been decided upon, but it is intended to make the interior bright. Tenders are to be invited as soon as possible, and it is hoped that the work will be commenced in about a month's time and the building ready for opening by the autumn of next year.



Law Cases.

A Solicitor's Building Speculation.—At the London Bankruptcy Court last week a sitting was held before Mr. Registrar Pope for the public examination of Alfred Harris, solicitor, of 15, Great Marlborough Street. The debtor attributed his losses to the failure of the petitioning creditors to carry out an agreement with him in connection with a building lease of a piece of land in the Tottenham Court Road upon which he intended to erect shops and flats at a cost of about £90,000. He returned his debts at £4,677, with no available assets. In examination by Mr. Burgess, assistant receiver, the debtor said in 1899, when he entered into the agreement for the building lease, which was offered to him as a good investment, he made an arrangement with a firm of architects to finance him with a view to completing the buildings and selling them to a company. The cost given him was under £100,000, but it worked out at a far larger sum. Nothing was done, and he was sued for over £4,000 for plans, commission, &c. The profit anticipated from the sale of the completed buildings to a company, when floated, was put at from £40,000 to £60,000. His father had undertaken to advance him £10,000. He had since sold the building agreement for £1,250. Replying to the solicitor for the petitioning creditors, the debtor admitted that the petitioning creditors agreed to find £75,000, but that the agreement was to find the total amount required, and their estimate of the cost was insufficient. His counter-claim for £10,000 in the action brought by the petitioning creditors was disallowed and their claim for £4,677 was given against him. The examination was concluded.

PRINCETOWN CHURCH.

ST. MICHAEL AND ALL ANGEL'S CHURCH, Princetown, was reopened recently after having been enlarged and partially reconstructed. Situated close to the convict prison, the church has rather an interesting history. It was built by French and American prisoners of war about 1816. Constructed of rough granite, the old church was a plain though solid building, cold and cheerless within and with scarcely any ornamentation. For some unexplained reason the original builders made all the walls of the same thickness, with the result that while the nave was substantial enough the tower was structurally weak. Some half a century ago the tower had to be braced together by girders, and even now it is not strong enough to carry a peal of bells. Before its restoration the church was in the form of a simple parallelogram about 50ft. long, the width being only 6ft. short of the length. The ceiling throughout was flat, and the four windows on each side had the glass set in strong iron lattice work—to act no doubt as a protection against the wind, which sweeps over the moors at times with tremendous force, and as a safeguard against the escape of prisoners, who formerly attended the church. Before the restoration the building was in a bad state of repair. Nothing has been done to the tower, but the nave has been almost entirely reconstructed, only the outer walls being retained, and the building has been lengthened by 40ft. eastward. The whole of the chancel is entirely new, and in the old part of the building two narrow arcades have been added to form the area into nave and aisles. To accomplish this reconstruction the old roof had to be abandoned, and a new cradle roof has been constructed over the nave, with lean-to roofs for the narrow aisles. The arches are of unusually wide span, the clear space between the piers being 22ft. Both the arches and piers are of Polyphant, and the latter are square with a considerable upward batter. Each bay consists of twin arches boldly moulded, with a space between them, the double arch dying on to the massive piers. Granite would have been preferred by the architect for the arches and piers, and would have been more in harmony with the rest of the building; but the committee found the cost too great, and therefore selected Polyphant. There is no clearstory, but over each column is an oval opening through the wall, which contains tracery. These have a quaint appearance, and give an original effect to the building. In the chancel is a large east window in tracery work, divided into three lights by massive mullions, which give additional strength to withstand the gales of Dartmoor. Unfortunately the ugly side windows have had to be retained, owing to lack of funds to replace them with tracery and better glass. The floor is temporary throughout. It is intended, as soon as funds allow, to add a vestry and organ chamber on either side of the chancel, and the new work has been so treated that this can easily be done without interfering with the main structure. The work has been carried out in a substantial manner by Messrs. Petherick & May, contractors, Lydford, from the designs of Mr. Edmund Sedding, architect, Plymouth, at a cost of about £1,300. Among other objects of interest in the church is an old carved wood pulpit, which was removed from Exeter Cathedral about half a century ago.

Masters and Men.

The Penrhyn Strike.—Signs of a settlement of the Penrhyn Quarry dispute are as remote as ever, and daily fresh batches of strikers are leaving for South Wales, where they find employment in the colliery pits. Strike-pay continues to be received, and the union affirm that they can hold out for a very long time. Inside the quarry work is proceeding satisfactorily, and the quarrymen who have returned anticipated high wages on the monthly pay day.

A Limerick Strike.—Seven members of the Limerick branch of the Amalgamated Society of Carpenters and Joiners were arrested last week on information sworn by Mr. Michael Gough, master-builder, charged with conspiracy, assault and intimidation arising out of the strike of carpenters for higher wages. The complainant alleged that the defendants forcibly took away one of his workmen. They were remanded on bail at the police-court. In connection with the case the solicitors for Mr. Gough have served notice on Mr. Corrigan, delegate of the Carpenters' Society, stating that, following the decision of the House of Lords in the Taff Vale Railway case, the Carpenters' Society would be sued for damages.

Hull Slaters' Dispute.—Conciliation between the Hull Master-Builders and the Slaters' Society seems as far off as ever. A proposed conference has fallen through on account of the Slaters' Society executive committee declining to meet the Hull Building Trades' Federation upon the matters under dispute. The term extended by the masters to allow the men to return to work subject to the newly-formulated code of rules expired on Thursday last. None of the men accepted the ultimatum, and the masters, according to the terms of their published conditions, considered applications from outsiders after reopening the yards. Work in the yards is very slow, and it is doubtful whether business will assume anything like its normal procedure until a conference is agreed upon.

Dispute at Bath.—About a hundred masons and bricklayers employed by Messrs. Jacob Long & Sons, of Bath, left work last week, refusing to labour with five men who have incurred penalties under the Operative Masons' and Bricklayers' Union which they refuse to pay. The men required that they should either pay up or that Messrs. Long should discharge them, and they also demanded that the employers should agree henceforth to employ only society men. The employers of course refused, and called upon the assistance of the Master-Builders' Association, who resolved that unless the strikers returned to work on Friday and complied with the working rules the members would lock out the union masons and bricklayers in their employment. The bricklayers, considering themselves misled by the masons, returned to work, and later the masons decided to follow their example. They began work last Saturday morning, the masters having granted them an extension of time before declaring a general lock-out. The men claim that they are now satisfied to work with the man to whom they particularly objected, he having paid an instalment of the penalties enforced against him by the union, but they admit abandoning the demand that Messrs. Long & Sons should only employ union men in future.

The Barry Carpenters, who came out on strike in May, 1900, for an advance in wages from 8d. to 9d. per hour, have now declared the dispute at an end, and claim that the majority of employers in the district pay the advanced rate. The local Master-Builders' Association, on the other hand, have refused as a body to recognise the advance, and have since that time employed non-unionists at 8d. per hour. The secretary of the latter organisation, who has been entrusted with the contract to erect the new museum and lavatories on Barry Island for the District Council, was recently called upon by the Public Works Committee to pay 9d. per hour as the amount "recognised" in the locality. A meeting of the Master-Builders' Association, after reviewing the circumstances, condemned the action of the Council, and added that they would not increase the carpenters' wages until they could also increase the wages of all the branches of the building trade.

Builders' Notes.

The Additions to the County Asylum, Prestwich, near Manchester, are being warmed and ventilated by means of Shorland's patent Manchester stoves with ornamental tiled sides, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Mr. Thomas Jenkins, a well-known builder and contractor, of Upper St. James Street, Newport, I.W., died recently at the age of sixty-five years. Deceased was a native of Ryde, having removed to Newport in 1879, and taken over the business of Mr. Joseph Poore, which was established in 1826. In consequence of ill-health, Mr. Jenkins took no active part in the business since March or April, 1899.

Carlisle Buildings Collapse.—A party wall in Lowther Street, Carlisle, with premises at the end of Lewthwaite's Lane belonging to Messrs. Clark Brothers, collapsed last week under peculiar circumstances. It seems that between the end of the Lion and Lamb Lane and Lewthwaite's Lane Messrs. J. & R. Bell had been making excavations with a view to the construction of cellars. The ceiling of a tea house was then seen to be cracking, and Messrs. Clark Brothers took steps to have the property professionally examined. The cracks extended and became rapidly wider, and it was deemed prudent to clear all out of the place, including the employees of the Carlisle Rubber Co. Soon afterwards the wall, with the archway, the tea warehouse, and part of the Rubber Co.'s premises, collapsed and fell into the pit which had been dug for the cellars.

Convention of Master House Painters and Decorators.—The eighth annual convention of the National Association of Master House Painters and Decorators of England and Wales will take place at Leicester on the 1st, 2nd, 3rd and 4th prox., under the presidency of Mr. John W. Barker, of that town. The programme is an interesting one, and the meeting promises to be a success. The following papers are announced: Mr. H. Looke, of Hull, on "What to Teach our Apprentices"; Mr. Walter Crane on "Some Thoughts on House-Decoration"; Mr. Fletcher, head-master of the Leicester School of Art, on "The Value of Design and Reticence in Decoration." The annual excursion will take place to Belvoir Castle on October 31st, and the annual dinner will conclude the day at the King's Hall, Grand Hotel, Leicester. All applications for tickets should be sent to Mr. George Bonner, 87, High Street, Leicester.

Partnerships Dissolved.—The partnership subsisting between Messrs. William Henry Parker and Thomas Christelow Barker, as manufacturing joiners, at No. 22A, Concord Street, Leeds, under the style or firm of "Parker & Barker," has been dissolved by mutual consent. All debts due to and owing by the firm will be received and paid by Mr. Thomas Christelow Barker, by whom the business will in future be carried on.—The partnership lately subsisting between Messrs. Albert Riley, John Alfred Riley and Arthur Riley, carrying on business as builders at No. 187, Pentonville Road, in the county of London, under the style or firm of "John Riley & Sons," has been dissolved hy mutual consent as from the 23rd day of August last. All debts due to or owing by the late firm will be received and paid by Mr. Albert Riley, who will continue the said business under the style or firm of "John Riley & Son."

Surveying and Sanitary Notes.

Pavement Uplifted by Mushrooms.—Last week some men on their way to work discovered that the tar pavement in Fitzjohn's Avenue, Hampstead, had been lifted by clusters of mushrooms in no fewer than three places. In each case the patch of tar paving displaced was about 1ft. square. One of the men collected the mushrooms and afterwards cooked them for breakfast. Fitzjohn's Avenue was built on a portion of the well-known Conduit Fields, in which mushrooms formerly grew quite plentifully.

Housing of the Poor.—At the congress of the Sanitary Association of Scotland which has just been held at Paisley, on the motion of Mr. Peter Fyfe, of Glasgow, and Professor Glaister, the following resolution was passed: "That, in the opinion of this congress, no plan for housing the poor in suburban areas or in the country need be attempted until it has been arranged, through legislation or otherwise, for the rates to be charged to the poor for transit to or from the city or town to be so reduced as to make country rents, plus travelling expenses, lower than town rents as at present charged in modern sanitary dwellings."

Engineering Notes.

Proposed New Bridge over the Thames.—At a recent meeting of the Brentford District Council a scheme for erecting a footbridge over the Thames at Brentford so as to provide a better means of access to Kew Gardens from this district and the northern part of the county was introduced, and the following resolution was passed with the addition that the plans should be prepared for the Smith's Hill site: "That this meeting is of opinion that a footbridge over the Thames would be a great acquisition to the town and the northern part of the district, and that the clerk be instructed to obtain such information as may be required, and the surveyor to prepare the necessary plans and estimates."

The Water Supply of Old London.—Argyll Street, Regent Street, is just now up for laying along its centre an electric cable; and many of the ancient wooden water-pipes which did duty in the days before iron was plentiful enough to be used for such purposes, and before there were means of working with the ease of modern times, have been unearthed. These ancient pipes are made of elm trees cut into lengths, with the bark left on, drilled through from end to end and fitted together. Of their age it is not easy to form an estimate. Argyll Street dates back no further than the beginning of the eighteenth century. Sir Joseph Banks was born there in the reign of George II., and in 1811 Madame de Staal was living there in lodgings opposite to Argyll House, once belonging to the Dukes of Argyll and afterwards to Lord Aberdeen, who was living there while Premier at the beginning of the Crimean War. Lord Aberdeen was the last nobleman to live on the eastern side of Regent Street. The house was pulled down in 1865. It seems probable that these wooden pipes, which are in excellent preservation, may be the original water-pipes laid down when Argyll Street was first built, and that they have been lying in the ground some 200 years. It is possible, however, that they may be much later in date, for until within a comparatively late period the subterranean arrangements of London were of a very primitive kind. As lately as 1853, for instance, there was a violent outbreak of cholera in this very district on account of the overflowing of cesspools into a well from which the inhabitants drew their supply of water.

NORTHFIELD CHURCH.

NORTHFIELD, just seven miles out of Birmingham, is one of the many interesting historical and old villages of Worcestershire. The church was said to have been dedicated to St. Michael, but it has recently been shown that St. Laurence is the patron saint; in fact, near the top of the tower on the west side there is a representation of a gridiron, the emblem of that St. Laurence who was roasted over a slow fire upon a huge gridiron. The church is a very interesting specimen of Early English and Early Decorated architecture. The upper portion of the tower is fifteenth-century Gothic. The walls of the tower are said to be 4ft. 6in. thick, and the tower is 53ft. high. The porch is a somewhat large and curious wooden-framed structure panelled in the Decorated style. The old Norman doorway lately removed, and other parts recovered, show some very good specimens of Norman carving. There is a very curious old lead rainwater drip or spout on the south side of the tower about 1ft. 6in. wide and projecting out quite 3ft. The following epitaph is to be found upon a gravestone erected to the memory of "James Sargent, carpenter and joiner, of Bartley Green, who died January 13th, 1799, aged 85 years":—

I was born on Christmas day
My parents was so glad of me
That to the wise men they did go
The nature of my birth to know.
He said that ingenious I should be
So a good trade provide for he
So to the nail block I was set
As if the Lord they meant to fret;
Which I pursued till twenty-three
Then seven years sawing was for me
Then with the plane and other tools
My God directed me to use
For what was offered me to do
My heart and hands could go through.

The lines were written and worked upon the stone by the deceased himself; and on the head of the gravestone are representations of a saw, plane, hammer and other carpenters' tools. There is a churchyard cross, erected at a cost of £300 as a memorial to the late rector (Rev. Henry Clarke, M.A.), which is worthy of inspection. It is built of Hopton stone.

THE DESIGN FOR LIVERPOOL CATHEDRAL.

A SUMMARY OF THE MATTER TO DATE.

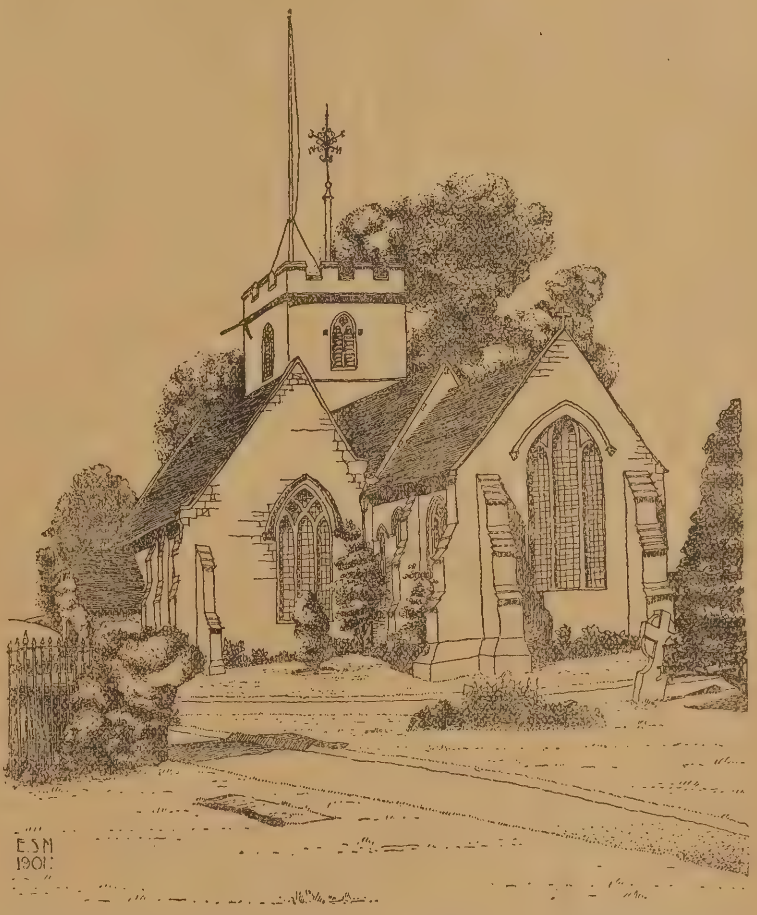
WE have already devoted considerable space to the vexed question of the proposed new cathedral for Liverpool, and in our issue for April 4th, 1900, we published Mr. Emerson's design. A great deal of time has been wasted by the discussion, but we think it will be of interest to draw attention to the summary which Mr. Thomas D. Cutler gives in a letter to the "Liverpool Mercury" and "Liverpool Daily Courier."

In this letter Mr. Cutler recalls the fact that the Liverpool committee invited architects generally who wished to enter the competition for the cathedral to send in for the committee's inspection portfolios of their sketches and designs of work executed. In response about 130 gentlemen (more or less) sent in porfolios. From these 130 the committee selected four to prepare designs for the cathedral—Messrs. Bodley & Garner, Mr. Brooks, Mr. Emerson and Mr. Pearson. Mr. Pearson did not send in a design, but the remaining gentlemen sent in three designs. The late Mr. Ewan Christian was appointed assessor, and in due course sent in his report (which was his award) to the committee. In the summing up of his report he states: "Mr. Emerson's is, in my opinion, on the whole the best." This report was published. Each competitor was paid £300 for his work, which, of course, did not half cover his out-of-pocket expenses.

From unavoidable circumstances, the matter was allowed to drift for fifteen years, through no fault of the architects. Now there is every probability of the cathedral being built. A new site has been selected, and more than £140,000 has already been subscribed, and the committee are now reconsidering who shall be the architect to build the cathedral.

It has been stated that "no actual award was made" by the late Mr. Ewan Christian. "This," says Mr. Cutler, "is a mere quibble of words. The report was the award, and understood as such by the committee."

It has also been averred that none of the three architects were placed or selected by the assessor. The following (taken from his summing up) is a sufficient answer: "You have now before you, I think, a sufficient description of the designs, their merits, and the contrary, as from careful study I have been able to read them. I have avoided, as far as possible, for the purposes of this report, any allusion to minor discrepancies of drawings, &c., not affecting the general question, and all unnecessary technical details, giving only the results of repeated examinations of the drawings and reports submitted by the respective architects, and need not further trouble you on these points, but will add a few remarks on the general subject. You will have gathered from what has preceded that I cannot speak of any one design as perfect in itself; each must be considered as a study, and each has both excellences and defects; and, bearing that in mind, I would say that for careful study of the whole scheme, and for adaptation of the design to meet all necessary arrangements for convenience and construction, Mr. Emerson's is, in my opinion, on the whole the best. Mr. Brooks' plan is very good, but must, I think, yield to that of Messrs. Bodley & Garner in respect of its principal feature and adaptation to modern requirements."



CHURCH OF ST. LAURENCE, NORTHFIELD. DRAWN BY F. STANLEY MITTON.

The opinion has also been expressed that having been in abeyance for fifteen years, therefore there should be a fresh competition. But Mr. Cutler asks, "Why? Mr. Aston Webb's design for the Victoria and Albert Museum was in abeyance for seven years, but the Government never thought of a new competition when they were ready to proceed."

In conclusion Mr. Cutler says: "Admitted that there is a change of site and changed conditions, surely no one will deny that Mr. Emerson is capable of meeting all these changes by adapting his design to the changed circumstances, or, if the committee wish, making an entirely new design. The fact that the committee have been unable to build the cathedral, for which they asked certain distinguished architects to compete fifteen years since, is surely no reason for behaving unfairly, and now when the committee propose to begin the work clearly the only honourable course is to give the commission to the author of the (best) successful design."

In reply to Mr. Cutler's letter another correspondent says that the following is a true statement of the case at the present time:—

(1) A site of contracted area, and consisting of sand and rubble, has been recommended and chosen on the ground of its supposed cheapness.

(2) The public have not been informed what the cathedral is to be in respect of fitness—in size and completeness—nor has it been made apparent that the Cathedral Committee have any definite conception of the matter. Indeed, so far as can be judged by what has transpired, commercial ideas have ruled in their counsels.

(3) Subscriptions towards the building of a cathedral have been given or promised, but the aggregate amount does not reach more than about one-fifth of the probable cost of a cathedral church really worthy of "the second city of the empire."

(4) Will it not be time enough to discuss the question of a design when the intentions and wishes of the committee are more fully and accurately known than they are at present?

The Electrification of the Underground Railway.—Both the Metropolitan and the District Railway Companies are preparing statements to be submitted to the Board of Trade in connection with the electrification of their lines. The Metropolitan Company advocate the application of the Ganz system, while the District Company desire a system on the principle of the underground electric railways already constructed in this country. On the receipt of the two statements the Board of Trade will appoint a committee to adjudicate.

Correspondence.

A School Board Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It is announced that a tender of £10,800 has been accepted by the Gillingham and Grange U.D. School Board for the erection of a new school in the Richmond Road, New Brompton. Plans for the school were recently selected in competition, one of the conditions being that the cost should not exceed £8,500. Have the unsuccessful competitors been fairly treated? Some may have sent in drawings for very cheap buildings who could have done much better had they known that the Board would spend £2,300 more upon the building than they stated they intended to do. There was no public exhibition of the drawings to demonstrate to the competitors the inferiority of their designs to the one selected. In these record-breaking days the speed with which judgment was passed on the fifty-five sets of drawings is worthy of note. The last day for sending in drawings was May 22nd. On the 30th—eight days later—the Board, unaided by a professional assessor, had given its decision. Might it not have been equally satisfactory to the competitors had they limited their work to drawing lots for the modest premiums—one of £10 and three of £5 only? Was there ever before a competition for a £10,800 building so cheaply conducted!—Yours truly,

SWEEPSTAKER.

The Westminster Paving Scandal.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The adoption of the so-called Californian red gum in the principal thoroughfares of Westminster has been ventilated by several correspondents in the "Times," the "Morning Post," the "Daily Telegraph," the "Daily Chronicle," and other journals, and it is as well that the subject should be placed before the public in a concise form in order that a clear and unprejudiced opinion may be easily formed upon the merits of the question.

The letters of the Hon. H. B. Lefroy, the Agent-General for Western Australia, the Hon. Henry Copeland, Agent-General for New South Wales, and others, respecting the above amply deal with the technical, Colonial and national points of view, and we, on behalf of the Ratepayers' Committee of the City of Westminster, propose to lay before your readers the facts which comprise the ratepayers' case.

It will be remembered that in July last public tenders were invited by the Westminster City Council for various street-paving operations, and amongst the other conditions of the specification, clause 16 provided as follows: "The wood blocks to be cut to the exact size of 9in. long by 5in. deep and 3in. wide. Each block to be cut perfectly true in size and shape, the deals being 'dimensioned' if necessary before sawing in order to ensure this." The following firms duly tendered: The Acme Wood Flooring Co., Ltd.; John Mowlem & Co.; William Griffiths & Co., Ltd.; The Improved Wood Pavement Co., Ltd.; E. Nuttall and Edward Alcott.

It appears that the Works Committee, which received the various tenders, referred them for consideration to a sub-committee. This sub-committee, feeling that it had little experience of the American red-gum blocks, recommended that a portion of Piccadilly only should be paved with them, in order that they might be put to an effective test. To the surprise of the sub-committee, when this proposal came before the Works Committee, some of the members championed the American paving with a great deal of feeling, and urged that a large contract be entered into with the firm. Mr. Emden, chairman of the Committee, and other members, strongly opposed this course, and a somewhat heated discussion was conducted for upwards of three hours, the supporters of the American system carrying their point in the end.

A meeting of the City Councillors was held on August 1st last, when the Works Committee stated that they had examined the tenders received in response to public advertisements, and recommended that the tender of Edward Alcott for American red gum and the tender of the Improved Wood Pavement Co., Ltd., for the Swedish deals be accepted, although the Acme Wood Flooring Company's tender for 9in. blocks (which was the size called for by the specification) was the lowest, as the Improved Wood Pavement Co.'s tender was for 8in. blocks. The quantity of timber required for this part of the contract, which is for Swedish wood, amounts to over 900 standards, and the difference in the market value of 8in. deals as against 9in. is £3 per standard, so that the Improved Wood Paving Co. had the advantage of nearly £3,000. Therefore, if the extra £3,000 is added to their estimate, the Improved Wood Pavement Co.'s tender becomes nearly the highest of the whole, instead of the lowest, as represented by the Works Committee.

The Westminster City Council stipulate that any firm shall be disqualified and their tender deemed out of order if it is not in accordance with the specification, and the following extract from page 21 of the agenda of the meeting of August 1st shows that John Mowlem & Co. and William Griffiths & Co., Ltd., were so disqualified: "The tender of Messrs. William Griffiths & Co., Ltd., and Messrs. John Mowlem & Co. are considered to be out of order, inasmuch as they do not provide for maintenance beyond the three years' free maintenance. Apart from this, however, the said tenders are not the lowest for the kind of material it is suggested should be used, and it will be observed that, without exception, the lowest tender of its class is taken."

The evident unfairness of what took place is shown in the sixth paragraph of the same page of the agenda, which is as follows: "The Improved Wood Pavement Co., Ltd., propose to use 8in. blocks instead of 9in. The company in their tender do not guarantee that the creosote oil to be used for the yellow deal blocks shall contain the amount of tar acids specified, and we think it well that acceptance of the company's tender be made subject to the withdrawal of this last modification."

Now the Improved Wood Paving Co., according to the disqualifying rule, should have been ruled out of order for not tendering for 9in. blocks, and the tender for Swedish deals should have been given to the lowest tenderer, namely, the Acme Wood Flooring Co., Ltd., as they and E. Nuttall were the only firms entitled to be considered having complied with the terms and conditions of the specifications. It is here that the good faith of the Council is at stake, and the question arises as to how the firm that violated the rule was not only not disqualified, but their tender actually recommended, although entirely out of order. The Improved Wood Pavement Co. would hardly of their own initiative have tendered for what was not asked or required in the specification.

Therefore, the transaction amounts simply to this. Several eminent firms are asked to tender; one of them privately suggests that some other particular article should be adopted, and the order is given to them. This is manifestly unfair, inasmuch as if 8in. blocks were to be used instead of 9in. as originally intended, fresh tenders should have been asked for from the competing firms. In common honesty, and for the sake of the good name of the city of Westminster, this contract for Swedish wood should be at once rescinded, and given to the firm whose tender was the lowest.

The adoption of American red gum by the Works Committee caused much surprise and astonishment among the members present, one of whom desired the opinion of the surveyor as to the red gum, and his experience of it, but strangely enough the chairman replied that it would be inadvisable for the surveyor to give his opinion at a public meeting. Consequently, this information could not be obtained. The vice-chairman of the Works Committee, Captain Jessell, M.P., on being questioned on the subject, frankly stated that he knew nothing about the red-gum wood, except that it was well advertised and had a good reputation abroad. Even this statement appears not to have the slightest foundation, in fact, as the timber as a paving wood is practically unknown, and is scarcely used, if at all, in the country (America) whence it comes. He also said that there had not been sufficient time to prove its durability. The points had been discussed for some hours by the Works Committee, and on this account he thought the matter should close. This appears to have been all that took place in connection with this important subject; certainly, it did not receive more than ten minutes of the councillors' attention, and they separated for their holidays, no doubt feeling that they had done their duty in handing over upwards of £100,000 of the ratepayers' money in this irregular and slip-shod manner.

The Governments of Western Australia and New South Wales have expended a very large amount of money in introducing and demonstrating the value of Australian hardwoods, and in the English companies which have been formed for the purpose of introducing this wood some millions of English and Australian capital have been embarked. For these reasons everyone should be more or less interested in seeing that Australian wood should have in every respect the preference, especially when it has been demonstrated that it is practically without equal.

A vast number of the principal municipalities in the United Kingdom have for some years adopted Australian hardwoods with the most satisfactory results. Indeed, no complaints were made as to its durability or its evenness when once properly laid until recently, when the surveyor for the St. James's district of Westminster stated that it was wearing in holes in several parts of his parish. Chiefly in consequence of his action, the Australian wood has been discarded in Westminster, but an examination of the foundations, when the wood has been taken up, disclosed the astonishing fact that the unevenness and holes in the roadways entirely arose from one cause alone, namely: that the concrete foundation was bad in the extreme and had given way in every place where the holes had appeared. No wood, however good, could possibly remain even and give satisfaction when laid on such a rotten foundation.

The red gum has only been laid down in a few important places within the last year or two, and this is principally due to the surveyor of the St. James's district before referred to, who without public competition secured its adoption in Pall Mall, Piccadilly, &c. It may, if of good quality, prove a serviceable pavement, but it is quite certain that the class of blocks—sappy and rotten—which have been delivered to Piccadilly, Cavendish Street and Whitehall, cannot possibly stand the rough wear and tear to which they are subjected; and, further, they are not to the specification called for, namely, 9in. by 5in. by 3in., as many of the blocks laid varied in size from 5in. to 10½in. long by 4¾in. to 5⅛in. deep and 2¾in. to 3½in. wide. What sort of pavement can possibly be made with such an assortment of sizes as this, even if the wood was of the best possible quality? The chairman and members of the Works Committee should surely give some attention to these matters and supervise in some manner their officials, who seem to be so wanting in their duty.—Yours truly,

The Westminster Ratepayers' Committee,
A. WESTLEIGH-ELLERTON, B.A.
J. MACCONNELL.

Reed Thatchers.

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—One of the most successful as well as ambitious examples of modern thatching is to be seen on a somewhat extensive residence upon the cliffs situated at the western end of Exmouth, in this county, known by the modest name of "The Barn." The thatched roofs of this very picturesque building are characteristic of Devonshire, and produce singularly quaint results. The architect under whom the work was recently carried out was Mr. Edward S. Prior, M.A., of 17, Southampton Street, Bloomsbury, W.C., who, I am sure, would gladly give such information about the actual thatchers as correspondents may desire.

I have had thatching done on my own private grounds from time to time, and the following names of a few capable men in this immediate neighbourhood occur to me: John Spencer, Kennford; J. R. Shepherd, Whimple; J. Searles, Clyst Hydon; H. Cumes, Kenton; G. Conway, Exminster; H. Rowe, Exminster; W. Salon, Clyst Honiton; C. Mair, Clyst St. George; B. Hutchins, Westwood Starcross; G. Conway, Exminster; J. Butt, Cheriton Bishop. All these

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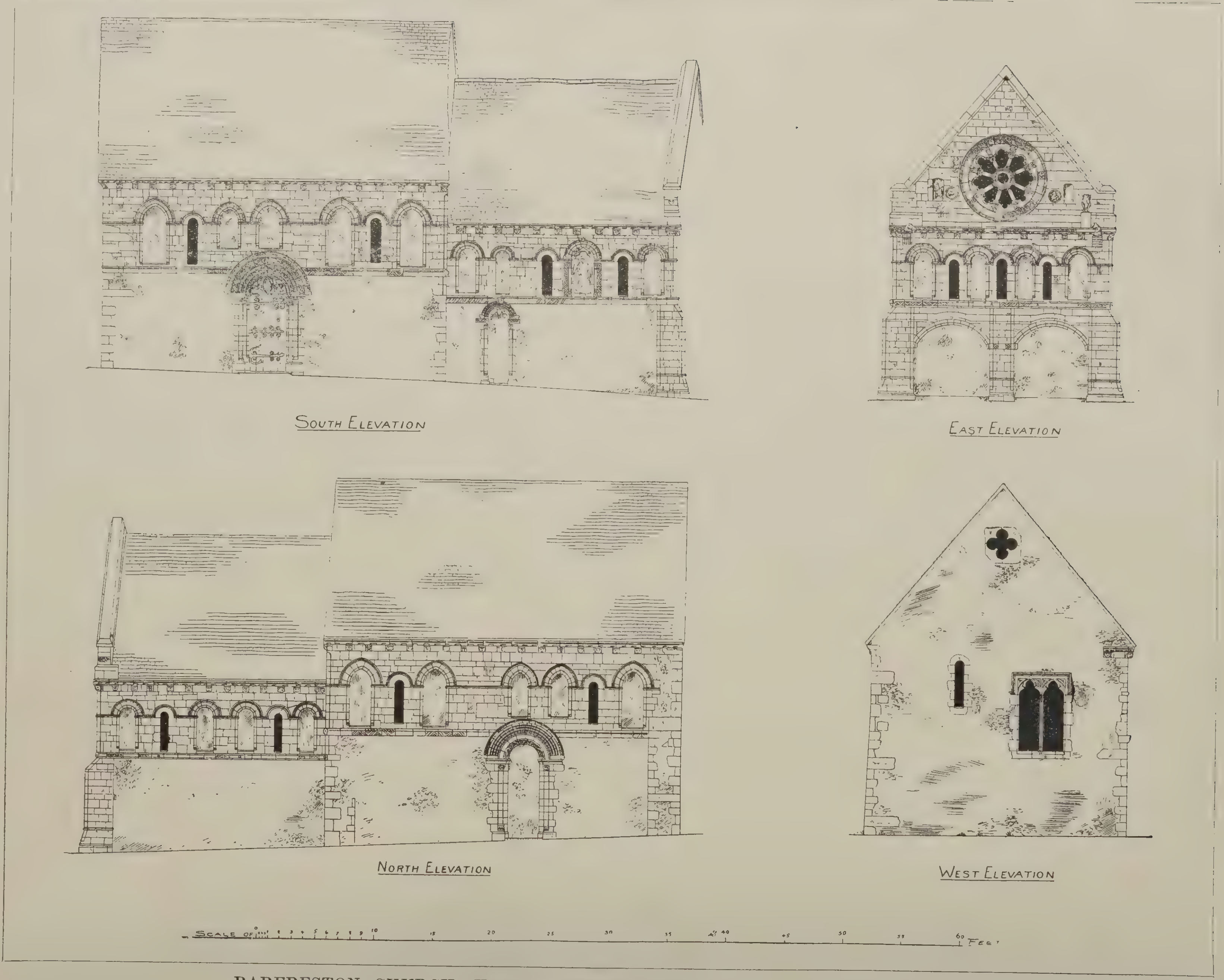

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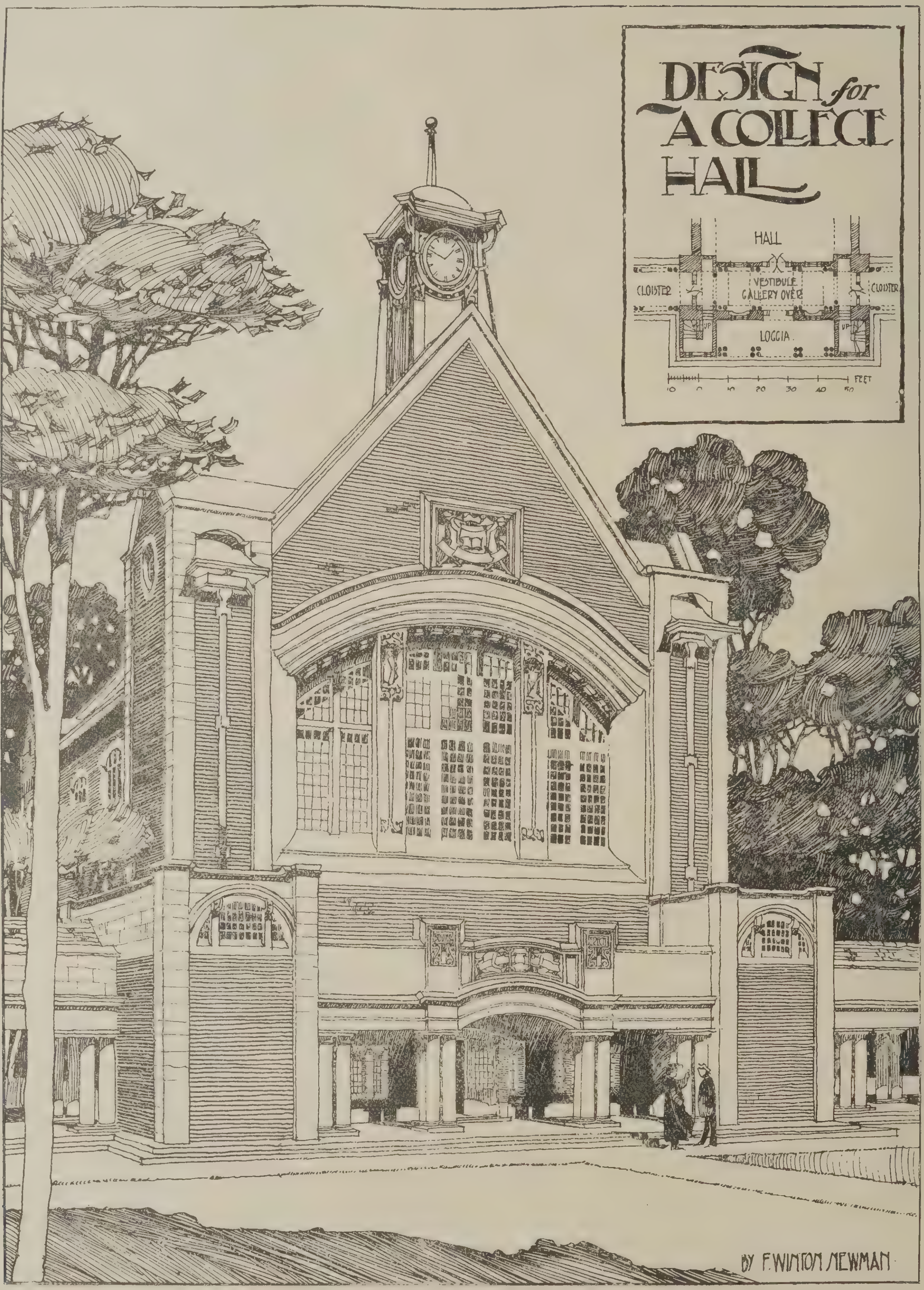

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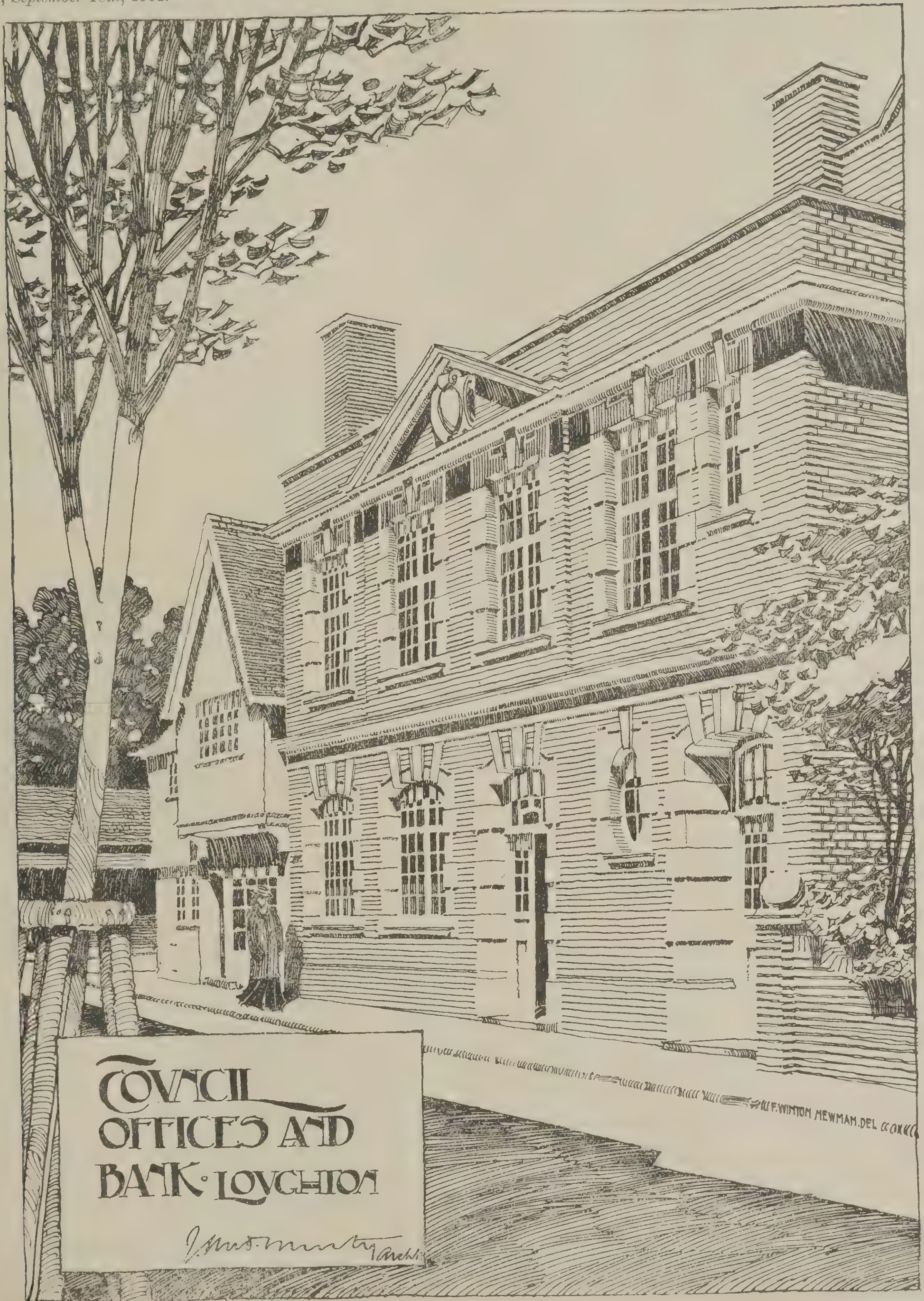
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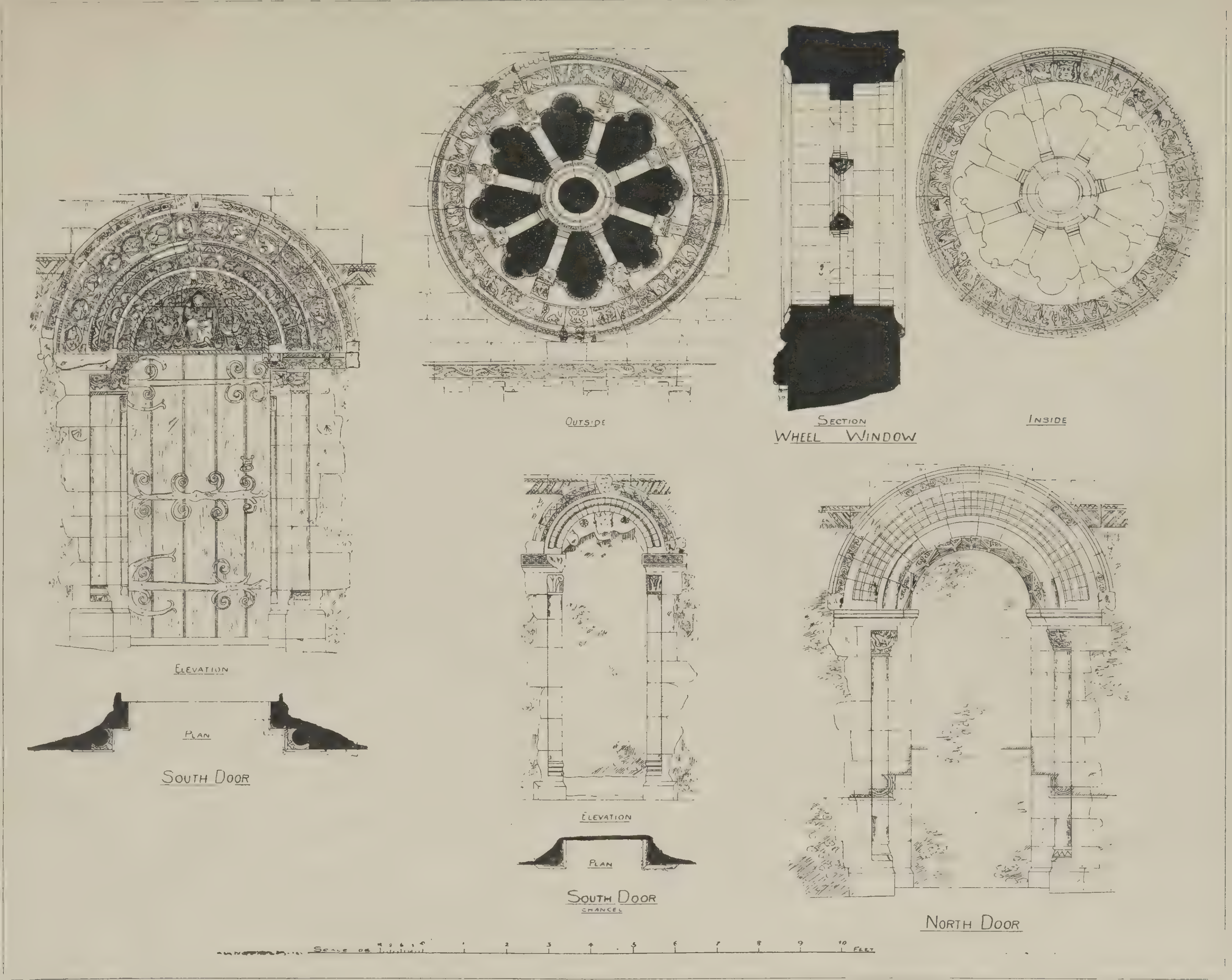

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places are villages in the immediate neighbourhood of Exeter.

The current issue of "Kelly's Directory of Devon" gives the names and addresses of no fewer than 140 professional thatchers resident in this county.—Yours truly, HARRY HEMS.

THE BRITISH ASSOCIATION.

THE annual meeting of the British Association opened at Glasgow last Wednesday with an address by Professor Rücker in defence of the Atomic theory. On Thursday sectional meetings were held. In the presidential address of Major P. A. MacMahon, F.R.S., to the Mathematical and Physical section, he said: In pure science a free interchange of ideas was possible, but in applied physics the commercial spirit exercised an influence. In a recent address Professor Perry had stated that the standard of knowledge in electrical engineering in this country was not so high as elsewhere. It was the duty of the Association to take an active attitude towards this serious blot on the page of applied science. It hindered investigations in pure physics by veiling from observation new phenomena, and by putting out of our reach means of experimenting on a large scale with new combinations. Professor Perry assigned several reasons for the present *impasse*, but confessed that he did not see his way out of the difficulty. It was undoubted that science had been neglected in this country, and that we were reaping as we had sowed. The importance of science-teaching in secondary schools had been overlooked. Those concerned in our industries had not seen the advantage of treating their workshops and manufactories as laboratories of research. The Government had given too meagre an endowment to scientific institutions, and had failed adequately to encourage scientific men and to attract a satisfactory *quota* of the best intellects of the country to the study of science. The country had been lacking alike in science, organisation and in effective co-operation in work. Suggestions had been made to remedy the defects by the construction of royal roads to scientific knowledge. Students had been urged to forego the study of Euclid, and as a substitute to practise drawing triangles and squares, to aim at the collection of mathematical rules of thumb, to leave out of account the knowledge of the meaning of processes so long as they could correctly apply the resulting rules. The advocates of these views were urging a process of "cramming" for the work of life which compared unfavourably with that adopted by the so-called "crammers" for examinations. The awakening of the student would come, perhaps slowly, but none the less inevitably; he might exist for a while on his formulæ and his methods, but with the march of events resulting in new ideas, new apparatus, new designs, new inventions, new materials requiring the utmost development of the powers of the mind, he would find himself hopelessly at sea, and in constant danger of discovering that he was not alone in thinking himself an impostor. In the science to which a man expected to devote his life, the progress of which he hoped to further, and in which he looked for his life's success, there was no royal road.

Specialisation.

At the present time the number of workers was so large, the treatises and scientific journals so numerous, the ramifications of investigation so complicated, that it was scarcely possible to acquire a competent knowledge of the progress being made in the many divisions of science. Hence the so-called "specialist" had come into being. This word was often used as a term of opprobrium or as a symbol of narrow-mindedness. The specialist was declared to be a man who ran after truth in intellectual blinkers, who wilfully restrained himself from observing the work of others and aimed at absolute independence as the one thing to be desired. The proposition might be advanced that all scientific workers were specialists; it was merely a question of degree. An extreme specialist was that man who made discoveries in only one branch, perhaps a very narrow branch, of his subject. But though the subject might be a narrow one, it by no means followed that the appropriate or possible methods of research were prescribed within narrow limits. What was required was not the disparagement of the specialist, but the stamping out of narrow-mindedness, and of ignorance of the nature of the scientific spirit and of the life-work of those who devoted their lives to scientific research. The specialist who wished to accomplish work of the highest excellence must be learned in the resources of science, and have constantly in mind its grandeur and its unity.

In the section of Mechanical Science the president, Colonel R. E. Crompton referred to

Traffic in Streets.

A most important problem in locomotion was that caused by the congestion of street-traffic in our towns and by the undoubted difficulties which existed in carrying our workers to and from their homes in the country to their places of employment in our towns. The number of our working population that used the cycle for going to and from their work was already very large and was steadily increasing. Then came the motor-car. After many years of objecting to the use of the over-head trolley system, our town authorities seemed now to have determined that the only way of relieving street traffic was by an enormous development of electrical tramways. It seemed opportune to point out that a great deal of mischief might accrue from this indiscriminate use of tramways. Of course, where the roads were rough and bad, anything in the nature of a tramway using rails was an improvement on a roadway; but with cities which already possessed well-laid-out and well-paved streets it seemed wrong to break up the surface of these streets for the purpose of laying tramways. Vehicles on the plain road surface could overtake a stopping or a slower vehicle going in the same direction without interfering with other vehicles, but street tramways must stop to set down and take up passengers, and this limited the speed-average and the number of vehicles. In America and on the Continent it was generally admitted that the maximum carrying-capacity of an electrical tramway in one direction was 4,000 passengers per hour past any given point. A full-gauge suburban or metropolitan railway crowded to its fullest extent could not carry more than 12,000 passengers per hour. But with crowded omnibuses almost touching one another and yet going a fair rate of speed, at eight miles per hour, 14,000 passengers could be carried past a given point per hour. It appeared certain, therefore, that although the provision of electrical tramways was undoubtedly an economical means of carrying passengers, yet that these tramways could not be laid in existing thoroughfares without considerably reducing the total road carrying-capacity at times of heavy pressure of traffic, and it appeared likely that either for the daily transport of the workers to and from their homes to places of employment or for taking great crowds out into the country for pleasure purposes, a motor-car service carried out on well-made roads would compete favourably with, and in many ways may be preferable

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to, tramway service. The increased road and street traffic and the development of new means of road locomotion had made imperative some modification of our existing system of roadway administration. Cycles, motor-cars, electrical tramcars, had been invented and put on roads maintained and worked exactly as they were seventy years ago at the commencement of the railway era. What was needed was that towns situated on our main through-roads should provide alternative routes, so that through travellers could if they desired avoid the crowded streets of the town. One method of providing such relief roads would be by by-laws providing that all building estates should set aside land for main roads. The building estates which were developed around our great towns never provided a road which could be used as a main line of thoroughfare, but laid out their roads to obtain quiet for those living on the estate. Parliament must take in hand an improved administration of our highways by a comprehensive scheme. Far too many ancient main lines of thoroughfare, already too narrow for the traffic on them, were being blocked by having tramways laid on them. Slow-moving and frequently-stopping vehicles were a cause of congested traffic. A great deal might be done by arranging that during certain hours much of the slower-moving traffic should be shunted into alternative routes, so as to be kept by itself. Motor-cars could safely travel at sixteen miles an hour, and therefore need only take half the time and occupy only half the street-surface that an omnibus did when travelling at eight miles per hour. Such high speeds as these, which were desirable and perfectly safe for motor-cars, could not, however, be obtained unless some regulations were made as to the use of the roadways by foot-passengers.

Foreign Competition.

One of the topics which had been most strongly discussed during the last year had been the position which this country held relatively to other countries as regards its commercial supremacy in engineering matters. A few years ago we were undoubtedly ahead of the world in most branches of mechanical engineering, but owing to the huge development of mechanical engineering in America and Germany we were certainly being run very hard by these countries, and everyone was looking for means to help us to regain our old position. In endeavouring to learn from America we saw that although the workmen in that country received higher wages than here, and although the cost of some of the materials was higher, their manufacturers managed to deliver engines, tools and machinery of all classes of excellent quality at a price which appeared to our manufacturers marvellously low. The chief difference between the manufacturer of America and the manufacturer at home was that, whether it be steam-engines, tools, agricultural machinery or electrical machinery, the American invariably manufactured goods in large quantities to standard patterns. In America work was far more specialised than here, so that a manufacturer as a rule provided himself with a complete outfit of machinery to turn out large numbers of one article. One reason why the American manufacturer had been able to impose on his purchasing public his own standard types, whereas we had not been able to do so, was that very rarely in America did a consulting engineer come between the manufacturer and the user. In America it seemed to be understood by the purchaser that it was a distinct advantage to everyone concerned, both manufacturer and purchaser, that the purchaser should to some extent give way and modify his requirements so as to conform with the standard patterns. On other matters it was quite possible for manufacturers here to combine so as to obtain some standardisation of parts.

On Friday, in the Mechanical and Physical Science section, Dr. Glazebrook, the Superintendent of

The National Physical Laboratory

exhibited plans of the new institution now being erected at Bushey, gave a short history of the building, and described the objects with which it has been founded. The main building consisted of a substantial central block about 70ft. square standing on a vaulted basement. At each corner there was a large wing practically single-storeyed; the rooms in these were being fitted up for various special purposes. In the central building itself would be two general laboratories. There would be a large entrance-hall, arranged as an apparatus-room and a library. The basement contained six rooms of fair size; the floor has been covered with a thick layer of concrete. The walls were very thick, so that they were extremely steady, and the temperature and conditions all favourable for steady work. In addition there were other smaller rooms in the basement; two of these were entirely surrounded by thick interior walls, and arrangements would be fitted to maintain a steady temperature throughout the year. At the back was another wing containing a number of rooms suited for special researches, and there a lift had been fitted and also a mercury column having a height of about 50ft. For the more delicate physical work the ground floor and basement of the old house afforded ample accommodation. For the engineering work a room 80ft. by 50ft. had been built, lighted from the north by a weaving-shed roof. It was divided longitudinally into two bays by a series of rolled steel pillars. The one bay would contain a light travelling crane; along the other ran a line of shafting for driving the machinery and for experimental purposes. Adjoining this laboratory was a drawing office, while the engine-house and boiler-rooms were close at hand. Power, obtained from a 60 kilowatt Parsons turbine, would be distributed electrically to various parts of the laboratories; this form of engine was chosen for the express purpose of avoiding vibration as far as possible. The necessary tools were on order and in course of installation. The work which the committee hoped to attack in the first instance was that which had already been under the consideration of the Alloys Research Committee of the Mechanical Engineers. Apparatus for the photomicrographic examination of steel rails was being set up, and machines for testing the elastic properties of alloys were in course of construction. Pressure gauges and steam indicators would also be tested. The height of the building would not allow the mercury column, now being erected, to measure more than 100lb. to the sq. in., but apparatus was being constructed for pressures in excess of that amount. Considerable attention was to be given to high-temperature thermometry, the testing of platinum thermometers and the measurement of electrical quantities. Before the end of the year the committee hoped the laboratory would be fully and usefully occupied.

In the Engineering section an account of the mechanical exhibits in the Glasgow Exhibition was contributed by Mr. D. H. Morton; and in the Anthropological section Mr. Bosanquet and Mr. Arthur J. Evans read papers on the explorations in Crete.

Sewage and Bacteria Beds.

In the Chemistry section a paper was contributed by Professor E. A. Letts, D.Sc., Ph.D., and Mr. R. F. Blake, F.C.S., F.I.C., on "The Chemical and Biological Changes occurring during the Treatment of Sewage by the so-called Bacteria Beds." It was, he said, generally assumed that the so-called "bacteria beds" acted as oxidising agencies, and that the micro-organisms mainly concerned in the purification process were the nitrifying organisms. If these views were correct, the effluent from the bacteria beds should contain nitrates and nitrites equivalent in amount to the unoxidised nitrogen which disappeared during the treatment. But on examining the results obtained by chemists in investigation on sewage purification it would be found that comparatively small amounts of nitrate and nitrite were produced in relation to the unoxidised nitrogen disappearing. In all probability there were only two alternative ways in which the nitrogen could be lost, by escape in the gaseous state as free nitrogen, or possibly as oxides of nitrogen; or by passing into the tissues of animals or vegetables, the former of which might escape from the bacteria beds, and the latter (and possibly the former also) might remain permanently in the beds. In an investigation the authors found—(1) Practically no oxygen was present, either in the sewage or effluents; (2) the effluents from first contact always contained considerably more carbonic anhydride than the original sewage, and with two exceptions the effluent from second contact contained an excess of that gas; (3) in eleven out of twelve series of analyses the quantity of nitrogen in the effluent was in excess of that present in the original sewage, and generally speaking it was in larger excess in the effluent from double contact than in that from single contact. In all probability only a fraction of the free nitrogen actually evolved would be retained by the effluent, the rest escaping into the air. As regards the possibility that nitrogen was lost biologically, *i.e.*, was absorbed into the tissues of animals or plants which feed on the sewage, there could be no doubt that a portion did escape in that way. The bacteria beds at Belfast and elsewhere swarmed with minute insects (Podura aquatica). These, escaping in myriads, often formed a thick layer on the surface of the effluent which looked like soot. There were also species of worms always present in the bacteria beds in considerable numbers, which no doubt also feed on the sewage.

Dr. S. Rideal said he believed that the main portion of this black soot-like substance referred to was not living at all, but dead inert nitrogenous matter which was formed in the breaking down of the organic nitrogenous substance of sewage, and contained roughly 7 per cent. of nitrogen. Dr. Rideal went on to read a paper on "Humus and the Irreducible Residue in the Bacterial Treatment of Sewage." He pointed out that the loss of nitrogen in bacteria beds which was not accounted for by the cover formed and gaseous nitrogen evolved was in part due to a black humus substance allied to peat, which he had found was formed in all the different methods of bacterial disposal which he had examined. This substance contained 7 per cent. of nitrogen, and was very stable, so that it did not decompose or give rise to any smell even if it was broken.

New Patents.

This patent is open to opposition until October 21st.

1900.— Sewage-Spraying Apparatus.— 16,037, S. H. Adams, Cumbrae, Park Avenue, Harrogate. Instead of one horizontal pipe balanced on a cental axis, two or more revolving sprinklers are used. These sprinklers are attached to a tubular framework which is laid on the filter bed. They are smaller, and revolve faster, than one single large sprinkler. Choking is avoided.

The following specifications were published on Saturday last, and are open to opposition until October 28th. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1900. — 9,508, Thomson, kilns. 15,861, Liddle, sliding hinges. 16,949, Sellars, machinery for moulding building blocks. 17,719, Foulkes, seats of water-closets. 17,758, Wehinger, wood flooring. 18,632, Potters' Decorative Supply Co., Ltd. (*Michaud*), machine for powdering transfer sheets employed in the decoration of pottery. 18,674, Beggs & Fielding, acetylene gas apparatus. 19,061, Sugg, incandescent gas burners. 19,543, Charlton, pipe couplings, T-pieces and flange joints.

1901. — 5,600, Williams, mechanism for sounding bells. 6,217, Breyer, process for softening water. 6,724, Rosenbusch, facing slabs for suspension on wire netting. 10,170, Walters, renewable seat valve. 10,590, Veritys, Ltd., & Ebbutt, globe holders for street lighting. 11,423, Erath, means for supporting ceilings and insulating damp walls, &c. 13,008, Bollé (*Lugino*), method of erecting walls. 13,136, Helbing, method for producing artificial wood. 13,271, Addison, partitions for schools and other purposes. 13,775, Augustine, wood-graining machines. 13,818, Wuhrmann, machine for parquet slabs. 14,018, Laurenties, dies for brick presses. 14,240, Clark (*Atlas Machine Co.*), stone carriers for stone-grinding and polishing machines. 14,920, Olson & Opland, combined slide gauge and T-square. 15,033, Pickles & Jones, cross-cut stone-sawing machine.

SOUTH KENSINGTON EXAMINATIONS IN BUILDING CONSTRUCTION.

THE REVISED SYLLABUS.

IMMEDIATELY after the examinations of the Board of Education held last May several of our readers sent us letters, which we printed, complaining of the papers that had been set. In any controversy as to the character of questions, students are at a great disadvantage. Students are the material worked upon by the teacher and examiner, and in the view of some they are mere clay in the hands of the potter. This is by no means a correct view. Students are not, however, except to a limited degree, in the position of critics, though they may be allowed to cry out when hurt or dealt with unfairly.

The critics worth listening to are those who have passed the ordeal of teacher and examiner—the finished article so far as school work is concerned—who can find time to give us their views in regard to school work and its connection with the actual work which we call practice. The teacher and examiner should be able to regard both the pupil and the man in practice; his business is not to make a vessel of clay, but it is rather that of teaching young birds to fly, and he will be the better fitted for this work if he can do some flying himself. The teacher and examiner should be in some degree a practical man, and perhaps the greatest educational difficulty we have lies in the disinclination of the practical man to teach or to write books.

From time to time we give space for samples of criticism of the kind suggested. The pungent address of Mr. Bulkeley Creswell to the Birmingham Architectural Association (see our issue for May 29th last), though (as he suggests himself, where he refers to a friend "who does not altogether agree with the views I have just put forward") its dogmas are not absolutely necessary for professional salvation, contains much which deserves consideration. Some young people may be encouraged by the result of the interesting personal experience of education there set forth to have the belief that after all there is a "royal road," that the schools with their skin and other troubles are worse than useless. Mr. Creswell does not mean this—a man has to learn his profession somewhere; he only contends that the methods of the schools need reform and that much of the matter might be exchanged for more useful matter. The very great diversity of the human being as a teachable thing is not sufficiently recognised. In our issue for June 19th last we published a report of Professor Lethaby's paper before the Royal Institute of British Architects, and in the same number an "American View" by Mr. Russell Sturgis.

Why is it that our text-books and examination papers are archaic? It may be denied that they are archaic, and it may be pointed out that every modern thing we can name is taken account of and dealt with in these papers and books. Modern methods are no doubt exhibited, but the whole skeleton is ancient and the soul is more than half a century old. Iron and Portland cement are of course mentioned, and a good deal is said about them; but the enormous changes in building methods effected by the modern use of these materials are very imperfectly shown. Diagrams of ancient "framed floors" are still used for the instruction of students in the elementary stage. Elaborate drawings of bonding of bricks can be made (diagram instruction) by pupils who cannot explain what is the proper relation of the length to the breadth of a brick.

The proper use of formulæ is not well-known. Actual numerical examples are not often worked, and any set of examination papers will show the most absurd results from the application of formulæ. Not occasional absurdities—the absurdities are general, and the correct answers are very rare. We have had experience of an examination in which for a certain question 90 per cent. of the candidates thought it necessary to write down $\mathrm{BW} = \frac{Cad^2}{l}$, where BW is breaking weight, C a constant for material, &c., a breadth, d depth, and l length of a beam. In no case did anyone get the correct answer, there being an almost uniformly graduated range from 200lb. to over 2,000 tons as a safe load upon a given beam.

Formulæ and diagrams need some kind of soul breathed into them. The formula or the diagram must be the expression of an idea. We might go on to considerable length with these views and instances; the occasion which suggests them is the approaching session of evening classes in preparation for the examinations to be held next May under the Board of Education. We print below the Revised Syllabus for Building Construction, and it will be noticed that important changes have been made. Hitherto questions on framed floors, roof trusses, complex bonding of bricks, &c.—matters not in themselves elementary—have been brought into the elementary stage mainly as examples of drawing. The new syllabus in some degree makes the stages follow the natural order of the subject: the elementary stage will deal with elementary building, and so on.

We believe we can assist teachers and students in their work, and we have arranged for a series of articles on building construction. The first of these articles will appear next week.

SYLLABUS.

Subject III.—Building Construction.

A larger number of questions will be set in the examination papers than the candidate will be allowed to attempt, so that he may have some range of selection of questions which bear upon branches to which he has given special attention.

A student of this subject must be a draughtsman: he should be able to show definitely by drawings what he intends to have carried out, and he should be able with readiness to explain details of construction by drawings and sketches: in the several stages he will be expected to show proficiency both in finished drawing and what may be called descriptive and explanatory drawing. He should know the most usual methods of multiplying drawings and copies of quantities as practised in architects' and builders' offices. He should practise sketching approximately to scale, and for this sketching paper ruled in faint squares is recommended. It is to be noted, however, that the subject of examination is building construction and not abstract drawing. Questions will be set which will not require drawing: in many cases time will be saved by the examiner specifying sketches to scale, on squared paper and otherwise. The knowledge of drawing assumed includes the use of the usual drawing instruments, scales, various ways of laying-down angles, applied projection (isometrical included) and perspective.

The standard of drawing will naturally be higher in the higher stages. Questions may be put which will specially test the candidates' neatness and accuracy in inking-in curves, and straight lines meeting curves, &c. The student is recommended to practise neat plain lettering and figuring.

Elementary Stage.

The candidate should know—how a pull or a push of so many pounds may be represented in direction and magnitude by a straight line, and how three forces in one plane in equilibrium, at a point, may be represented to scale and are parallel to the sides of a triangle; the weights of water and iron, and approximately of other materials used in building; the meaning of stress per sq. in. (or sq. ft.); roughly the safe loads for common materials; about mortars, quality of good sand, Portland cement, limes; about slates and roofing tiles, and modes of fastening; about concreting in floors, roofs, walls, &c.; plain floor tiling, spacing of joists, rafters, &c.; plain carpentry and joinery—trimming-joists and rafters, usual scantlings of timber proportions of doors, doors, windows, floors, skirtings, simple trimmings round doors and windows; elementary ventilation and warming; bonds of brickwork; varieties of rubble masonry; plain plastering; plain painting and glazing; easy plumber's work; ironwork—locks, hinges, fastenings, grates, rainwater pipes and gutters, &c.; elementary drainage connections with sewers and cesspools.

The bulk of the questions will have to do with elementary buildings, say labourers' cottages and artizans' dwellings.

Questions will be set to test the powers of direct observation of the student, and he is recommended to miss no opportunity he may have of inspecting buildings in process of construction.

Advanced Stage.

The questions set in this stage shall be designed to test advanced knowledge of the subjects enumerated for the elementary stage. The bulk of the questions will apply to buildings up to and inclusive of town houses of £100 valuation, country villas, ordinary shops and medium-sized warehouses.

The student should know—how to draw diagrams of stresses for roof trusses and simple braced girders with simple gravitation loads; how trusses of wood and of iron (or steel) are put together (spans up to 40ft.); the use of rolled joists, weights and strengths of stock sizes, the bearing of beams on walls; connection of woodwork to walls; to find the bending moment at any part of a beam under any system of gravitation loading (beam supported at both ends); what is meant by moment of inertia of a cross-section; Young's modulus; combinations of iron (or steel) and Portland-cement concrete, concrete roofs, fireproof construction; to test Portland cement; varieties of timber, sources and characteristics; well-known building stones, bricks and building materials generally; how to take rough quantities for estimating.

Questions will be set in—excavation for foundations, sewers, &c., timbering, piling, concreting, framing, nature of soil, &c.; damp-courses; exclusion of vermin; dampness of site; connection of walls with ground, &c.; purpose-made brickwork, terra-cotta, artificial stone, &c.; stone-cutting, various dressings for quoins and ashlar, stone stairs, &c.; slating—sizes and qualities of slates, hips, valleys, fancy slating, creasing, shelves, cisterns, sinks, &c.; advanced carpentry and joinery — panellings, stair building, &c.; casement and French windows, wainscottings, window trimmings, &c., &c.; asphalting, sound-deadening, ventilation, hot-water supply, heating, gas and electric supply, water supply, lightning conductors, preservation of iron, timber, &c.; lead, &c., lights in wood frames and in stone ones; various kinds of glass and glazing; ranges, grates, mantels, fastenings of all kinds; furniture of doors, &c.; bells; painters' work of all kinds; advanced plumbers' work—soil pipes, ventilation pipes, connections with sewers, traps, inspection chambers, water-closets, baths, sinks, flashings, flats, gutters, valleys, &c.; scaffolding; shoring and strutting; effects of wind and rain on buildings, &c., &c.

Honours.

The Honours examination will be divided into two parts, which cannot both be taken in the same year, and no candidate who has not been successful in Part I. can be examined in Part II. A certificate or a medal will only be given when a success in Part II. has been obtained.

Part I.

This course will include buildings of all kinds and sizes. The student will be expected to show that he can practically apply principles of physics (mechanics, chemistry, &c.) in building construction. He should be able to design roof trusses and beams of every kind; to draw stress diagrams of trusses under every kind of loading; to calculate the thrust of arches, and provide for every kind of stress at every part of large buildings; to understand the method of taking quantities; and he should know something of relative and approximate prices of work and materials, to explain in a rational way the mode of manufacture of important building materials—cement-making, brick-making, quarrying, &c. He should be able to describe tests for every kind of important building material. He should be able to answer questions showing an intimate knowledge of all the matters enumerated for the lower grades.

Part II.

This course will include questions on the history of architecture; the candidate will be required to show by sketches and drawings that he has an accurate knowledge of notable examples of architecture. It will also include the subject of specifications.

The examiner will have in mind in setting the questions the actual practice of architects in designing buildings and in their management of assistants and clerks of works to ensure that their orders will be properly carried out;

the dealing with contractors, and also the actual carrying out of works under direct management. Candidates will be asked to make sketch designs and give instructions to draughtsmen for careful scale-drawings and specifications. The questions may deal with any part of the subject and with any kind of building whatever.

Those candidates whose answering of the paper is sufficiently satisfactory will be summoned to South Kensington for a practical examination. This further examination will be held on one or more days—the time will not not exceed seven hours each day. Candidates will be asked to design a building suitable for a definite purpose, and they shall be required to give such plans, elevations and sections, and such details and notes for a specification, as shall be required by the examiner. An estimate of cost will also be required.

Candidates must provide T-squares, set-squares, drawing instruments, ink and colours. Drawing paper and drawing boards will be provided by the Board of Education.

No candidate can be classed in Honours who is not successful in the practical examination.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Liability to Keep House in Repair.

LONDON.—Z. Z. writes: "Under the following clauses from a three years' agreement relative to the letting of a suburban house at £50 rental per annum—(1) Can the landlord be compelled to replace during the tenancy a defective hot-water cistern which leaks from small holes, probably due to the material having perished by condensation? The cistern was not new at the commencement of the tenancy. (2) The landlord fails to reasonably repair and keep up his property, and the external ironwork is gradually perishing for want of paint, and was in this state before the tenancy referred to commenced. (3) Wallpaper in a bathroom has perished and is falling from the plastered walls, and the plaster (due to bad material) falls out as well. Can the landlord be called upon to execute these repairs (2) and (3), or must the tenant? The clauses in the agreement are as follows: 'The *tenant* agrees to keep the interior of the house and premises (except as hereinafter mentioned), together with all the glass in the windows and all water-pipes and taps and the fittings and things thereto belonging, and all locks, keys and fastenings and other fixtures and things therein, in good and sufficient repair, order and condition. To deliver up the house and premises, together with all the fixtures and fittings, at the expiration or sooner determination of the tenancy in such good and sufficient repair, order and condition (reasonable wear and tear and damage by fire excepted). And the *landlord* agrees with the tenant as follows: To keep the roof and outside walls wind- and weather-tight and the main walls and timbers in good structural repair and condition during the tenancy.' "

The landlord is only bound to keep the premises wind- and weather-tight, and to do structural repairs to the main walls and timbers; hence he cannot be compelled to (1) replace a defective hot-water cistern or (3) make good the wallpaper in the bathroom, or to restore the the plaster of the plastered walls. As to (2), the question is somewhat vague, but unless the failure to repair amounts to a failure to keep the premises wind- and water-tight, the landlord cannot be held liable. The tenant is only liable to do internal repairs, and therefore has nothing to do with the external state of the premises. He is, however, liable to keep the place in proper condition, and therefore to repair the plaster in the bathroom and re-paper the same.

A. O. H.

The Sanitary Institute Examinations.

ALRESFORD.—H. G. writes: "What is the address of the Sanitary Institute? What subjects are necessary for their inspectors' examination, and also what text-books would you recommend?"

Write to the secretary of the Sanitary Institute, Parkes Museum, Margaret Street, W. The Institute publishes a list of books in the syllabus of the examinations.

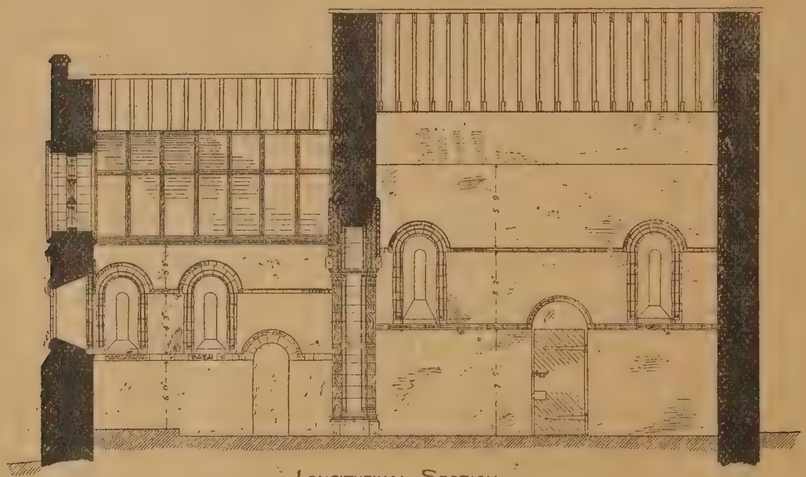
A Question of Light.

BANGOR.—CYMRO writes: "In altering my business premises, I intend to form a large window between the present window and door. At the side of the latter is a passage leading to some cottages, and immediately opposite is an old graveyard. I am informed that the trustees of the graveyard can prevent me enlarging the present window, as I shall thus create a new light. I enclose sketch (not reproduced)."

The trustees of the graveyard would be at liberty to erect on their own premises an obstruction to any actual new light within nineteen years and a day of its creation; but if, in order to block the new light, they also blocked the old one, they could be forced to remove the obstruction. Records of what is done should be carefully preserved and properly verified, giving both the present condition of affairs and the condition after alteration. It would be best not to alter the present window frame at all, nor to shift its position in the least. G. A. T. M.

Dry-Rot Fungus.

WINDERMERE.—R. W. W. writes: "About twelve months ago the floor of a coach-house which I built three or four years previously showed signs of decay, and when a few boards were removed it was found to be in a very bad condition, being much eaten away by dry rot or some other equally destructive parasite. The floor was re-laid and more ventilation given, but now a fine powder of a reddish-brown colour comes up at the vent grids and covers the tops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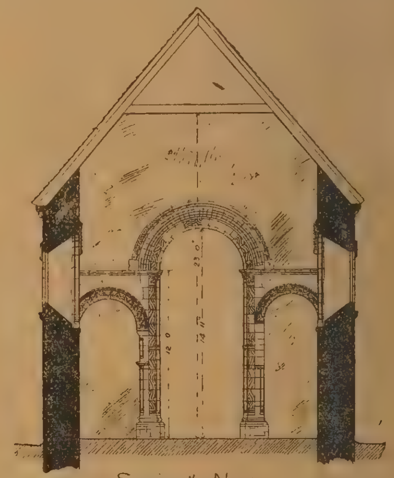
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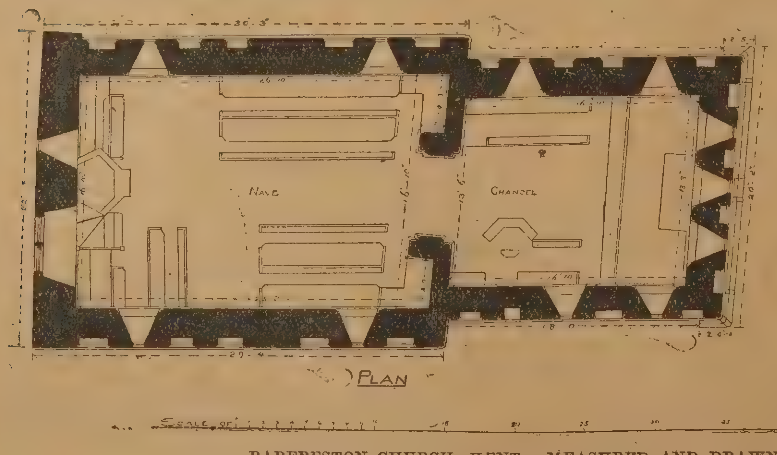

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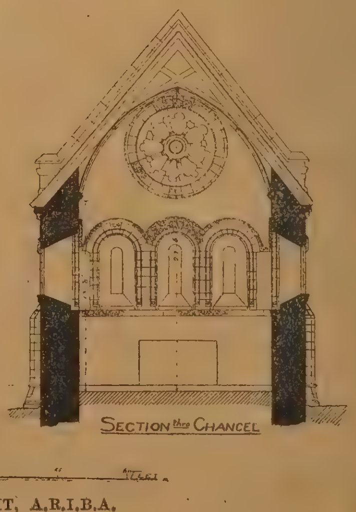
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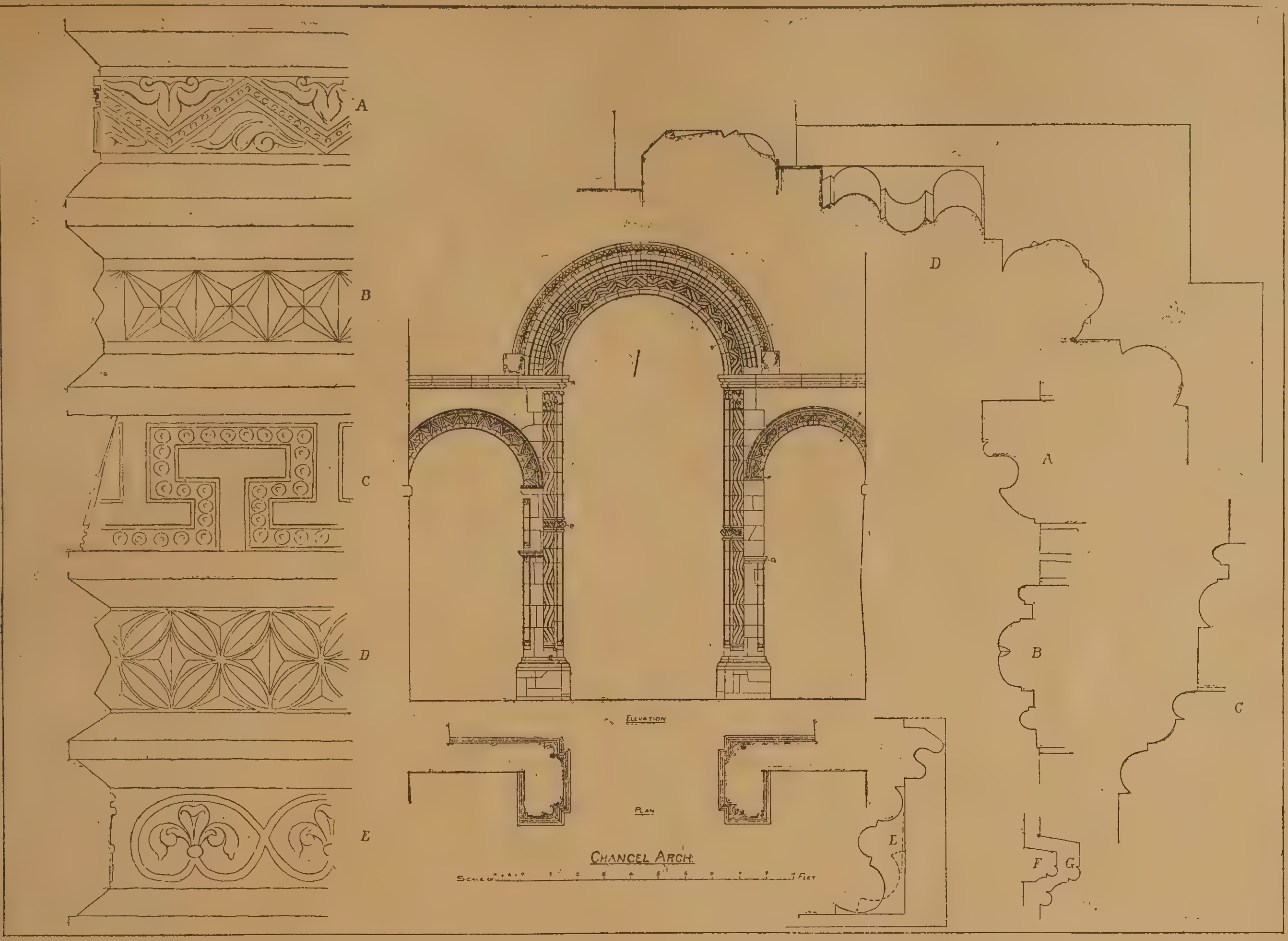
BARFRESTON CHURCH, KENT. MEASURED AND DRAWN BY J. F. DUTHOIT, A.R.I.B.A.



BARFRESTON CHURCH, KENT. MEASURED AND DRAWN BY J. F. DUTHOIT, A.R.I.B.A.

of the carriages, cushions, &c. This powdery stuff (of which I send a sample) has been examined under the microscope, and the cells seem to be perfect. Can you tell me what the fungus peculiar to dry rot is like, and will it live in a dry well-ventilated place? There is a clear air-space of 12in. below the floor joists."

We have had the powder microscopically examined in the laboratory of Professor Bayley Balfour, Regius Keeper, Royal Botanic Gardens, Edinburgh.

It consists principally of fine pieces of wood in high state of disintegration, together with the spores of the dry-rot fungus. It is of the highest importance that the spores should be got rid of immediately—since they will not only renew the trouble in the coach-house, but from the cushions of the carriages they are certain to be conveyed on the occupants' clothes into other houses (wardrobes, &c.), with the result that very serious damage is sure to be done in other buildings. Further, spores in such abundance as to form a perceptible layer of dust are highly undesirable things to inhale. It is a very difficult matter to recommend a simple remedy. The best advice to follow is that given by R. Hartig at p. 75 of his work on "Der Achte Hausschwamm." As regards the appearance of the fungus peculiar to dry rot, the most striking features are the long ash-grey strands formed by the mycelium and the spongy-like fructifications which become dark-brown with age. A very good description will be found in the above-mentioned work.

Right of Way over Land.

W. G. writes: "I bought a piece of land large enough for fifteen houses with a frontage of 15ft. each. I built eight houses, and sold the remainder of the land. When I did this I agreed to allow the purchaser to use the entrance of my back street. He afterwards bought the adjoining piece of land and built eleven houses on it, using my entrance. Can I compel him to make an entrance for these eleven houses?"

No particulars are given as to the general situation of the houses and land, but as an expression of opinion it is considered that under the circumstances the adjoining owner may reasonably claim a right of way over the back street for the tenants of his houses. T. E. C.

Fonts in West Country Churches.

EXETER.—DEVONIAN writes: "Kindly give a list of churches in the West of England where I could find some Early English and Decorated fonts."

I am not aware of any first or second Pointed fonts near here (Plymouth). They are rare in these parts. EDMUND SEDDING.

Patent Glass Lights.

NEWCASTLE-ON-TYNE.—B. P. writes: "Can you recommend some kind of patent glass lights that will really light up a passage about 30ft. long by 5ft. 6in. by 10ft.? It has a window of about 5ft. super. at one end, but the other end is very gloomy. Can you recommend a good book on architectural book-keeping and practice generally, and a really lucid work on the construction of stone vaults?"

We recommend you to apply to Messrs. The Union Plate Glass Co., Ltd., of Pocket Nook, St. Helen's, who make "Refrax" glass; Messrs. Wilson & Co., of Harrison Street, Gray's Inn Road, W.C., who also make prism glass; and Messrs. P. E. Chappuis & Co., of 69, Fleet Street, E.C., patentees of the well-known Chappuis' reflectors. There is no practical book on architectural or builders' bookkeeping. For works on stone vaults see answer to enquiry under heading "Scientific Masonry" on p. 11 of our issue for August 21st last.

Cause of Stone Window Heads Cracking.

COVENTRY.—A CONSTANT READER writes: "I enclose a sketch (not reproduced) of a house. The stone heads, which are 9in. by $4\frac{1}{2}$in. best box Bath-stone, have both cracked right through. The windows have 4ft. 6in. openings. Kindly suggest some cause for the cracks. The contractor contends that the whole weight of the gable is on the two points fractured, and that the stone was not sufficiently strong; but I am of opinion that the stone is of sufficient dimensions to carry the weight, and that a relieving arch should have been constructed at the back of the head over the lintel."

The builder is right; the masonry between the ground-floor windows has comparatively only a small weight to carry, having voids directly over it, and consequently it does not settle; but outside the weight of the whole of the masonry comes upon the heads, causing the parts directly beyond the vertical line of the oriel to settle and crack at this vertical line. You should have shown relieving arches over the lintels on your plans. The builder should not be blamed; if you intended him to take the responsibility you should have given him a free hand in the design. You can prevent a repetition by using relieving arches over the lintels or steel girders for lintels. In the latter case you must take care that the stone heads are free from any load which would cause them to give at all, by putting the lintels above the heads on section, still keeping them from showing on the face.

The Institution of Junior Engineers.

LONDON, S.W.—C. B. C. writes: "How can I become a member of the Institution of Junior Engineers?"

Write to the Secretary, Mr. Walter T. Dunn, 47, Fentiman Road, London, S.W.

Liability to Repair Drains.

BRIGHTON.—PINDAR writes: "In a certain lease for twenty-one years the lessee covenants to keep both the inside and outside, with the fixtures and glass windows, in good condition and tenantable repair (damage by fire excepted); and at the expiration or sooner determination of the term to yield up the premises in good condition and repair, and in fair and proper order (damage by fire excepted). The lessor covenants before February 1st then next to put the premises in good and tenantable repair and condition both internally and externally. The drains at the house have recently been found defective, and the lessee instructed a builder to repair them. The builder reported that almost all the pipes were unsound, being of obsolete pattern. The lessee applied to the lessor repudiating liability for anything beyond repairs. The lessor told the builder to repair only, but notified lessee that at the expiration of the lease drains would be renewed. The lessee has again repudiated liability to reconstruct, and points out that the lessor could not claim better drains than originally existed; also that he (the lessee) is not even liable to leave drains *as good* as they were originally, as these clauses have been held to allow 'wear and tear,' although the words 'wear and tear' are not mentioned. Is lessee right in his contention? Can you recommend a really reliable and up-to-date book on dilapidations?"

The lessee under his covenant is only bound to keep the drains in good order and repair, and thus maintain them in a similar condition to that generally obtaining at the commencement of the lease. It is therefore considered that the lessor cannot call upon the lessee to entirely reconstruct the drains, so as to leave them in a better condition and state of repair than they were at the time of obtaining possession. Some valuable information respecting "dilapidations" will be found in No. 4 of "Specification," published at these offices, price 5s. nett. A long paper on the subject by Mr. W. J. Jennings, F.S.I., appeared in the BUILDERS' JOURNAL for March 27th last.

T. E. C.

Cost of Statues.

LONGTON.—J. J. writes: "What would be the approximate cost of a draped statue 10ft. high by 5ft., executed in bronze, marble, granite and stone?"

The question is too vague for us to give anything more than the most nominal approximate cost. The cost of the design of the statue will of course depend upon the standing of the sculptor, and will range to any amount from, say, £15. The cost of pointing and finishing and of the material of a statue 10ft. high by 5ft. wide, inclusive of pedestal, however, can be roughly estimated at about £150 for bronze, £350 for marble, and £85 in a soft easily-worked stone, but the cost will vary very considerably, according to the amount of finish put on the work, the prices we have given being the lowest for work that is fit to be seen. Of course, a bronze statue is only a thin sheathing of this alloy. The model for a metal statue will cost more in proportion, as it has to be finely finished for moulding. A marble statue requires a greater finish than a stone one, and as it would in all probability only be used for interior work close to the eye it would require more careful finishing than stone. Granite is hardly ever used for statuary; it is a most difficult, tedious, and expensive material to work. In Egypt, the proverbial country of its adoption, it was almost exclusively carved in very low relief, the statues in granite being generally colossal, and considerably conventionalised to suit the material. But of course the Egyptians were unmindful of labour, as they had plenty of slaves.

Copies of Rural By-laws.

BY-LAW writes: "I should be glad to know whether or not a person intending to erect certain buildings for which he must submit plans to the local authorities can legally demand a copy of that authority's by-laws. About eighteen months ago, having occasion to submit plans to a certain rural district council, I wrote to the surveyor asking for a copy of his council's by-laws. I was told 'that the by-laws were out of print, and that there were no spare copies left, but I might peruse *his* copy at *his* office.' This I was obliged to do, although his office is twenty-one miles by rail from my own; and I am still unable to get a copy for the same reason. I have had a similar experience with another authority."

Strange to say, local authorities are under no specific obligation to even print their by-laws. The only course to adopt is to complain to the Local Government Board; while, if an action results for infringement at the instance of the local authority, the fact that no copies of the by-laws could be obtained, though demanded with the full intention of complying with them, would be a material point in defence.

G. A. T. M.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Show me the back windows of a man's dwelling and I will tell you his character. The rear of a house only is sincere. The attitude of deception kept up at the front windows, leaves the back area defenceless. The world enters at the front door, but nature comes out at the back passage.—BRET HARTE.

Our Plates. IT is seldom that any record of the erection of a rural church is met with, and in this respect that of Barfreston is no exception to the rule. Situated in the midst of a tiny village about six miles from Dover, it is a small but exquisite specimen of late Norman workmanship. At the Conquest the manor came into the possession of Odo of Bayeux, but there is no mention of a church in the Doomsday Book. One writer has suggested the church was erected at Hackington, near Canterbury, in 1185 by the Archbishop Baldwin, and was pulled down again and re-erected here. The hunting scenes sculptured upon the arch stones to the south door have given rise to the legend that the building was the outcome of a hunting vow by a noble of the district, but it is never met with in any authentic form. The church consists of an oblong nave and chancel; the axis inclines to the south-east, and the walls are very far from being at right angles to one another. The proportions are striking: the length of nave 26ft. 10in., the width of the nave 16ft. 8in., the length of chancel 16ft. 8in. (the width of nave), and the width of chancel 13ft. 8in. (half the length of the nave). Opening into the chancel is a lofty and richly-moulded arch with wavy fluted pillars to jambs, with an arched recess on either side; the windows are bonnet-shaped, with deep splays with moulded jambs and labels, and the wheel window to the east end has every stone making up the arch carried with grotesque figure and ornament. Externally the church is of very rich design on the three sides (the north being quite plain) and built of flints to the string-course above of dressed freestone, with recessed arcades pierced with very small round-headed windows finishing with a corbel table supported on corbel stones carved in grotesque faces and subjects. The roof is tiled. The east end has below its windows three buttresses connected together by segmental arches forming two recesses. The circular east window is a very fine example; it is divided into lights by mullions shaped like columns with grotesque heads and capitals. The lights are trefoiled, and surrounded by circles every stone of which is carved with grotesque animals and subjects and ornamented by a rich label mould. In so small a building it is remarkable that there are three doorways; and the south door, which is the chief glory of Barfreston, is counted as the finest example of the work of the period.

The Holborn Workhouse. IN the course of the modern London improvements the old Holborn Workhouse, with its queer, prison-like yard, will shortly disappear from the Gray's Inn Road. The old building has long survived as a reminder of the old days of Oliver Twist, whose trainer in evil doing, Fagan, had his abode in Saffron Hill, hard by. The removal of this "pauper's paradise," as this particular workhouse has been ironically termed, is a welcome sign that the portion of the Gray's Inn Road to the north of Holborn Town Hall will receive the same improvement that has already been accorded the southern section. Hardly any main thoroughfare has changed so little for the better during the past fifty years as this busy and crowded highway between King's Cross and Holborn Town Hall. Shabby stables and ugly manure heaps face the windows of the Royal Free Hospital, near which the only signs of improvement of late years has been the converting of a couple of the neglected graveyards into pleasant recreation gardens. One of these, by the way, situated to the west of the main road, contains the tombs of Anna, granddaughter of the great Oliver Cromwell, and Zachary Macaulay, father of the famous historian. These memorials in the garden of St. George the Martyr are scarcely known to one Londoner in a thousand, but the curious old workhouse is a familiar eyesore, and must have often met Dickens's eyes as he strolled down the Gray's Inn Road from 40, Doughty Street, where he so long lived and worked.

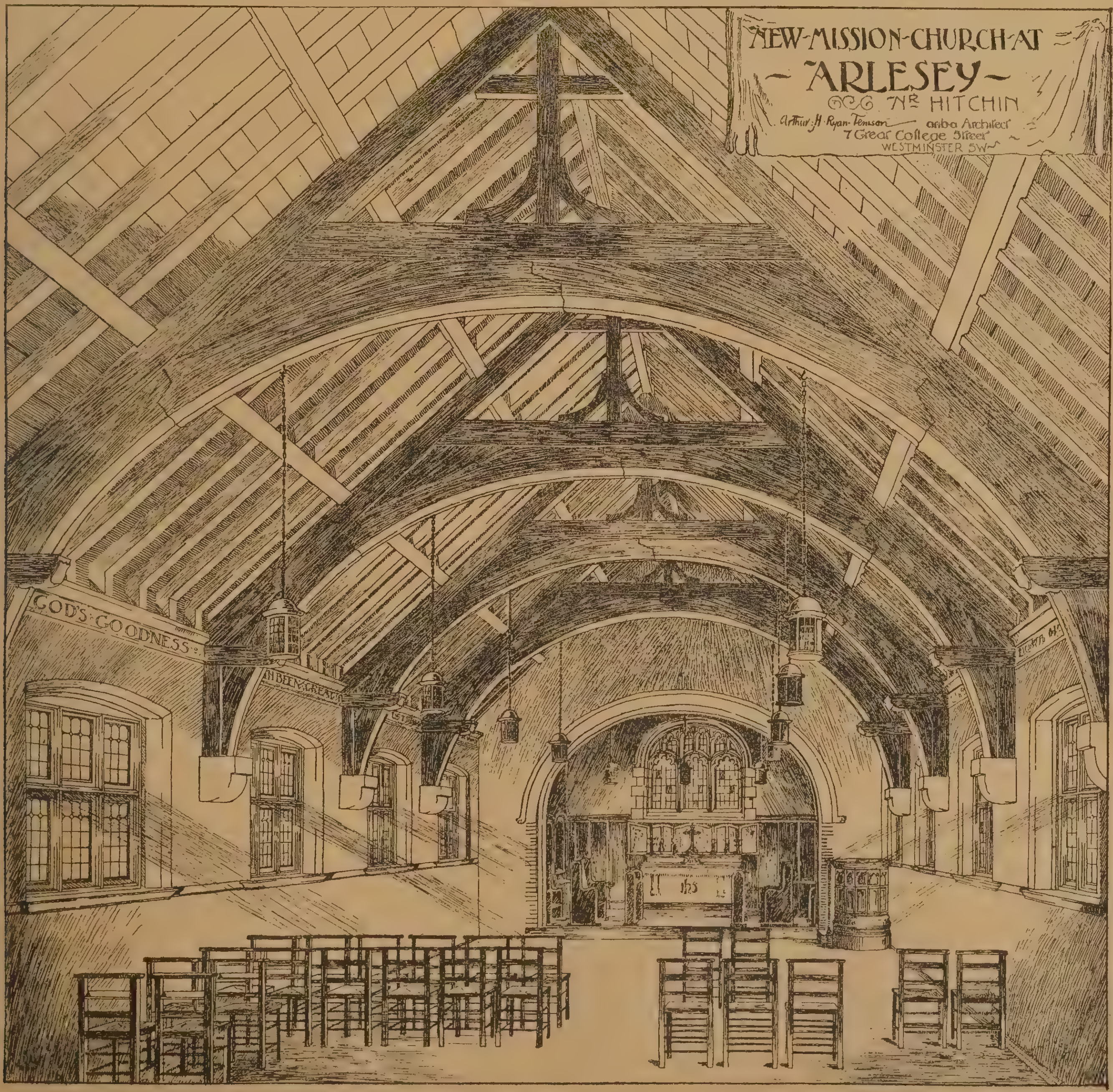
Derwentwater. CANON H. D. RAWNSLEY, writing to the "Times," says: "Subscriptions keep coming in, and we have reason to believe that by the middle of October we shall be able to feel that the nation has a mile of the western shore of Derwentwater, in unspoiled loveliness, for its permanent possession—its rest and enjoyment. The encouraging feature in the work of collecting the necessary funds has been the evident enthusiasm for the English Lake District scenery which has inspired the gifts and the deep satisfaction that an attempt has been made before it is too late to ensure that part of the surroundings of one of our most beautiful lakes shall never be jeopardised by woodcutter or builder. Mr. G. F. Watts, R.A., writes me: 'Of course I am in most entire agreement with your serious endeavour to preserve the locality; the movement has my deepest sympathy—I would say, if I could, how important I consider it in these days of change to preserve every object of beauty and worth.' By the same post that I received this letter came one from a Lancashire mill-girl, who, having asked her mother and sister to join her, sent 3s. to the fund. A common feeling makes us wondrous kind, and thanks to Wordsworth and to Ruskin and the increasing care for natural beauty that Gray ministered to we find amongst our list of subscribers side by side with the mill-hand the master-manufacturer, and side by side with the poet and authoress the humble working man. What but this common love for British scenery 'secure from rash assault' has brought such different minds together to this effort as Rudyard Kipling, the Master of Trinity, Lord Milner, the Provost of Eton, Mr. A. Waterhouse, Edna Lyall, Sir John Brunner, Mrs. Rylands, Mr. Marshall, Lord Portman, Lord Ashton, Miss Octavia Hill, the Mayor of Birmingham, the Mayor of Liverpool, Mr. H. Philips, Mr. Rathbone and the Bishop of Carlisle! It is because 'from Nature and her overflowing soul we have received so much' that it is permissible to believe that Great Britain will not let the National Trust fail of its intent for lack of the last few hundred pounds."

Stained-Glass Windows at Staines. A LARGE seven-light stained-glass east window and a small three-light side window have recently been placed in St. Peter's Church, Staines. They have been faithfully carried out by Mr. J. Jennings from the designs and cartoons of Mr. Edward Fellowes Prynne, R.B.A., brother of the architect of the church Mr. George Fellowes Prynne, F.R.I.B.A. The subject of the large window is the "Church Triumphant," and of the small one "The Nativity and Adoration of the Magi and Shepherds." The east window, which is rich in colour and full in composition, and has no conventional canopy work, represents Christ in Glory surrounded by typical saints of the old and new dispensations and hosts of angels, which crowd the top of each light as well as the tracery above. Much of the symbolism is taken from the Book of Revelation. The window, besides the figure of Christ, contains 112 figures, including saints, angels, cherubs and children, and four symbolic animals. The whole is intended to convey the sense of multitude, triumph, glory and praise, with the utmost splendour of colour. Christ is seated on a rainbow throne, and the Holy Spirit in the form of a dove hovers above. Beneath the feet of Christ is the sea of glass and the symbols of the Lamb and the open book of the Seven Seals and the Alpha and Omega. The Holy Innocents hold palms over the Lamb. The Virgin Mary crowned and Joseph holding a lily are on one side, and St. John the Baptist on the other side, and next to him kneels St. Mary Magdalene. In the lower half of the centre three-lights of the window the three great archangels stand on clouds. In the centre St. Michael stands in golden armour, with one foot on the great red dragon, whose barbed tail is coiled round the world below. St. Gabriel and St. Raphael stand on either side, looking down at the world, waiting, with trumpets of judgment. The four remaining lights—two on either side of the central three—are each divided into three parts. In the top divisions are the Apostles and the Evangelists seated on clouds, with St. Peter and St. Paul at the extreme left and right. St. Stephen is also seated with these. Each light contains one of the Evangelists. In the next compartment below are seated four fathers of the Church—St. Augustine and St. Gregory on the left and St. Ambrose and St. Jerome on the right—and the four major prophets, Isaiah and Daniel on the left and Jeremiah and Ezekiel on the right. In the third and lowest compartment are Adam and Eve on the extreme right and left. Next to Adam is Noah holding the Ark; near him stands Abraham. Next to Eve, on the other side, are Sarah and Ruth. Adam is surrounded by sheaves of corn and fruits of the earth, and a sickle, and Eve by lilies and other flowers; and behind them both are fruitful trees bearing pomegranates. Next these in the inner two lights are the four typical leaders of Israel—King David and Joshua on the left; King Solomon, holding a model of the Temple, and Moses on the right. At the tops of each light, except the centre one, are crowds of angels with harps and offering incense.

The National Bavarian Museum. THE New National Bavarian Museum is claimed to be the finest arranged in Europe. The surroundings of the new building are reposeful. The building itself is a free interpretation of the German Renaissance, with a strong dash of the Italian. The general arrangement in the series of galleries on the ground and first floors of the museum is most felicitous in its combination of the strictest chronological and historical accuracy with great æsthetic and decorative charm. The late Roman art in its provincial phases, and the Byzantine, the Romanesque, and Carlovingian one starts with. Then on through the twelfth, thirteenth, fourteenth, fifteenth and sixteenth centuries, illustrated by carvings in wood and stone, by altar-pieces rescued from oblivion in mouldering churches, by costly tapestries in wonderful preservation, by goldsmith's and silversmith's work, by ivories, glass, and objects of art of every kind—grouped, however, so that there is no confusion. The latest phases of German art, those of the seventeenth century, and of the outside Germany much despised Teutonic *rococo*, may be studied here and in Munich generally as they can hardly be studied in any other German city. The vagaries of the *rococo* are, it is true, distasteful enough to the student of the *Régence* and the Louis-Quinze styles. They are especially repellent when applied to the main architectural features of a building—as in France they seldom or never were. But often the schemes of wall and ceiling decoration have sometimes a fantastic attraction in their exuberance. A suite of apartments in the royal palace at Munich gives some of the most brilliant examples of this peculiar phase of German eighteenth-century art.

ST. ANDREW'S MISSION CHURCH, ARLESEY.

THIS little church has been erected to supply a growing and working population centred around Three Counties Station, G.N.R., and situate about two miles from the parish church. The committee's original instruction was to design a building to be used for the twofold purpose of religious services and parish entertainments, but as the work neared completion it was decided to use it for religious services only. The plan consists of a hall or nave with a spacious western half-timber porch, a shallow sanctuary (to be lengthened, so soon as funds permit, in accordance with the architect's design), an organ chamber and vestry, with a bell côte containing two bells. The stalls and furniture are from the architect's special designs, who has also suggested and had carried to completion a special scheme of colour. The heating and ventilating of the building has been carefully attended to. The materials are Arlesey brick-facings with special red dressings and stone eastern window, with green slating. The cost of the structure, exclusive of furniture, is £830, or about £3 17s. 6d. per head. The building was consecrated in June last by the Lord Bishop of Ely. The contractors are Messrs. Kelsey & Sons, of Chessington, Surrey, and the architect Mr. A. H. Ryan-Tenison, A.R.I.B.A., of 7, Great College Street, Westminster, S.W.



Keystones.

St. Mary's Church, Oatlands Park, near Weybridge, is to be completed by the addition of a tower at a cost of £2,500.

The French Sculptor Mérel has been commissioned by the municipal authorities of Neuilly to execute a bust of General Henrion-Bertier, who was for a long time mayor of the town.

A New Public Hall for Hatfield, to be known as the Victoria Hall, is being erected, the contract price for the building being £470 12s. The architect is Mr. T. Monte, of Hatfield.

Mr. J. W. Start, F.S.I., architect and surveyor, of High Street, Colchester, and of 54, New Broad Street, London, E.C., has taken Mr. Reginald Rowell, A.R.I.B.A., into partnership. The firm in future will be known as Start & Rowell.

A St. Albans' Competition.—The local competition at St. Albans for the new infants' school at Garden Fields has resulted in the work being given to Messrs. Smee & Mence, the design by Mr. S. Doddimeade Edmunds, architect, of St. Albans and London, receiving the only premium awarded.

St. Andrew's Church, Swanwick.—Messrs. Naylor & Sale, architects and surveyors, of Irongate, Derby, have prepared plans for important alterations and improvements of St. Andrew's Church, Swanwick. A tower is to be erected on the north side of the church, and in it there is to be placed a peal of bells. There is also to be a clock in the tower and a chamber for the bell-ringers. It is stated that the peal is to consist of five bells.

The Parish Church of Llandenny, near Usk, has recently undergone extensive restoration. During the work the removal of a mediæval buttress disclosed a window which is believed to be one of the very few fragments of pre-Norman church architecture remaining in the Principality. The opening is only 3in. wide, the inner splay broadening considerably. A new pulpit has been erected by the parishioners in memory of Queen Victoria, and the lych-gate, which is one of four early examples existing in the diocese, has been restored.

Vandalism at Holcombe.—At the beginning of the present month there stood on the moor above Holcombe and Ramsbottom the base of an ancient cross. For centuries it had been known as the Pilgrim's Cross, and by that name it is mentioned in numerous documents. Early in the thirteenth century it is named in a grant of land by Roger de Montbegon, and it is named again and again through the succeeding centuries in similar grants. When the cross disappeared is not known. The massive base remained until the other day, a little weathered, and with a clumsily-carved inscription referring to the labour troubles early in the last century, but otherwise Time had dealt gently with it. The Rector of Holcombe recently discovered that it had been removed, and further investigation showed that it had been broken into small fragments and buried in a wet "bog hole" not far away.

The Work of Placing the Gigantic Statue of King Alfred on its pedestal came to an abrupt conclusion at Winchester on Tuesday of last week owing to an accident which caused considerable excitement. The work had been going on during the whole day, and a large number of townspeople had gathered to witness the raising of the figure, which was being done by means of a rope connected with a stationary engine and running over a pulley hung between two shear-legs. The figure weighs nearly 6 tons and measures about 17ft. About half-past four the upper portion had been raised a few feet, when one of the guy ropes snapped, and a second afterwards one of the shear-legs broke under the extra strain thrown upon them, and the whole structure came down with a crash. Fortunately, between the breaking of the guy rope and the snapping of the shear-leg there had been time to place a prop under the statue, and though one of the shear-legs fell across it it is not thought to be injured. The contractors for the work are Messrs. Driscoll Brothers, of Maidstone, one of whom was struck by a falling pole as he was giving orders to the engine-driver. He was badly bruised, but not dangerously injured.

As a Memorial to Cardinal Manning at Nazareth House, Hammersmith, a "Manning" ward has been inaugurated; and the night refuge in Providence Row, E.C., will be extended at a cost of over £7,000.

Mr. H. R. Lloyd, a well-known Redditch architect and surveyor, died last Thursday from accidental poisoning. He was confined to his bed with a cold, and it is stated that Mrs. Lloyd mistook a bottle of carbolic acid for his medicine and administered a dose from it. She at once gave the patient an antidote, but he died in great agony a few minutes later.

A Royal Artist.—The Isle of Wight Fine Art Society opened its annual exhibition at Ryde last week. The place of honour was given to a painting in oils of some Egyptian ruins by Princess Henry of Battenberg (the president of the society). Her Royal Highness has for some years been represented by paintings at this exhibition.

The New Park of Potter Newton, recently acquired by the Leeds Corporation for £35,000, was formerly opened last week. The estate includes a mansion-house, which, it has been suggested, should be used as the lodgings of the assize judges. The park is an undulating and picturesque piece of ground, and is one of several parks which the Corporation have provided for the people.

At St. Paul's.—One of the original old lead pipes on the north side of the interior of St. Paul's Cathedral, of enormous weight and length, has been removed, renovated and refitted. These large pipes were for carrying off the rainwater from the roof. The installation of electric light in the building is progressing favourably. A Bond Street firm of electricians are carrying out the order, and it is expected by the beginning of next year the work will be finished. The decorations are by no means finished, and the scaffolding for the completion of the roof of the chancel is still up. Mr. Harding, who for twenty-five years has held the office of clerk of the works, has not had a single mishap during his whole period of office; and in recognition of this fact and his services to the cathedral the dean and chapter and the workmen presented him with several handsome pieces of furniture on his twenty-fifth anniversary.

The New Technical College at Scarborough, which has been erected by the Corporation on a commanding position on The Green, is almost complete. The building is of red bricks, with buff-coloured terra-cotta, a square tower capped by a dome being a feature at the south-west corner. The building is in the English Renaissance style. In the basement the physical laboratory, the heating apparatus, working machinery, testing machines and workshops are situated; on the ground floor is the examination and lecture hall 70ft. by 30ft. In the first floor are the chemical laboratory 70ft. by 30ft. and 28ft. high, and the chemistry lecture theatre, with accommodation for eighty-four and sixty students respectively. Rooms for astronomical study are on the second floor and in the tower. Projecting from the latter is a handsome clock after the pattern of that in the old Tolbooth, Edinburgh. The cost of the site, building and furnishing will be about £21,000 or £22,000.

The Report of the Director of the National Gallery, Ireland, for the year 1900, which has just been issued as a Parliamentary paper, gives details of the pictures, drawings and engravings which have been purchased and added to the collection during the period under review. Among these are the "Virgin and Child," ascribed to Jan Mostaert, and "The Dilettante," by Cornelis Troost. The donations include "The Flagellation," by Luea Signorelli, and "Naworth Castle." The late Mr. Henry Vaughan (London) bequeathed a series of thirty-one drawings by J. M. W. Turner, R.A., on the condition that they should be publicly exhibited only during the month of January in each year. The gallery has also received valuable additions to the general collection by the bequests of the late Miss Margaret M. Stokes and Sir Henry Barron. For the portrait gallery Miss Stokes also left a sketch portrait of Lord Edward Fitzgerald, by James Petrie, and a sketch for portrait of John Clarence Mangan. During December last there was an exhibition of works by the late Sir Frederic W. Burton.

The Queen Victoria National Memorial Fund now amounts to £150,000.

The New Anatomical Department of Glasgow University, comprising an extensive laboratory, museum, &c., was opened last week. The architect was Mr. Frank Burnet.

Mr. George Lambert, F.S.A., died last week in his seventy-eighth year. He was well known as a gold and silversmith in London, and held the office of prime warden of the Goldsmiths' Company.

The Buxton Thermal Water Pump Competition has been won by Mr. Gustave Agate, of Pendleton, Manchester. The second premium has been awarded to Mr. C. Swain, of Buxton, and the third to Messrs. Warren & Cargill, of Matlock Bridge.

Mr. John R. Thomas, the architect of the new Hall of Records in New York, died recently. After his death the papers said that his successors would doubtless be Messrs. Horgan & Slattery, the Tammany architects. The public hardly believed that the Administration would have the impertinence to take this step, and so spoil one of the most beautiful buildings in the city. The Board of Estimate and Apportionment have, however, given the work to Messrs. Horgan & Slattery.

Competition for Llanrwst Market Hall.—Twenty competitors submitted designs for the proposed new market hall, &c. at Llanrwst in North Wales. The site is an important one in the centre of a large square. The only premium of £20 has been awarded to Mr. E. Grubb, of 13, Rawcliffe Street, Blackpool, for a design intended to be carried out in Penmaenmawr granite, freely relieved with Yorkshire stone dressings.

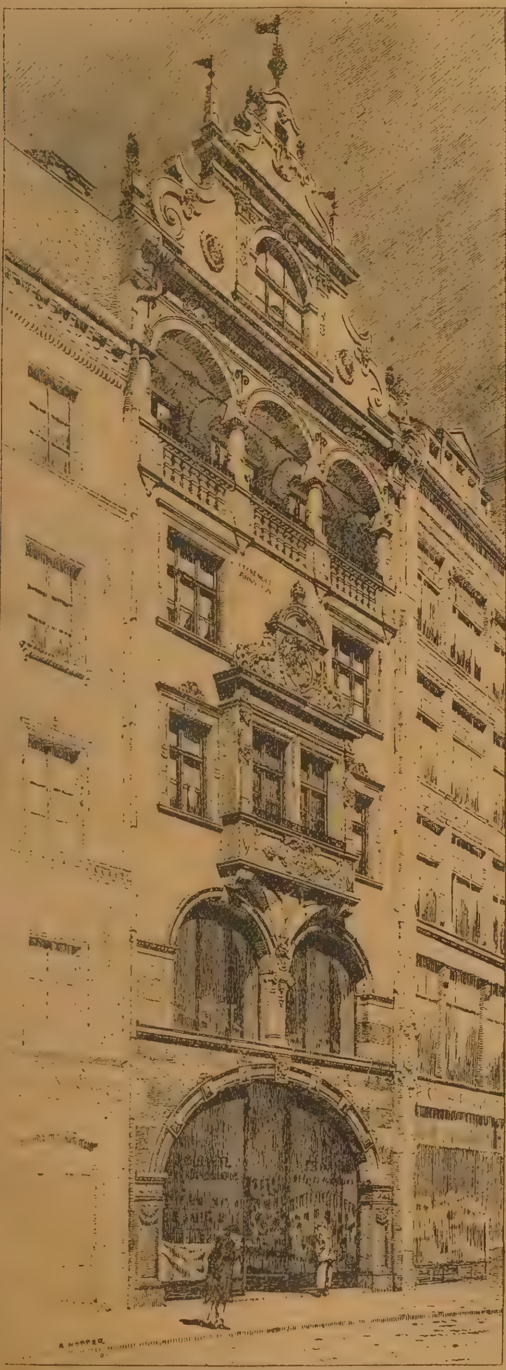
At the Battersea Polytechnic, Battersea Park Road, S.W., classes have been arranged for in mechanical engineering and building construction. The class in masons' work is a new departure, and the instructor is Mr. John Wornell. The class is intended for apprentices and artisans engaged in masons' work. The instruction will be thoroughly practical, and will include the application of descriptive geometry to masons' work, the making of working drawings, setting out and executing the work in stone. Further particulars can be obtained from the secretary, Mr. Joseph Harwood.

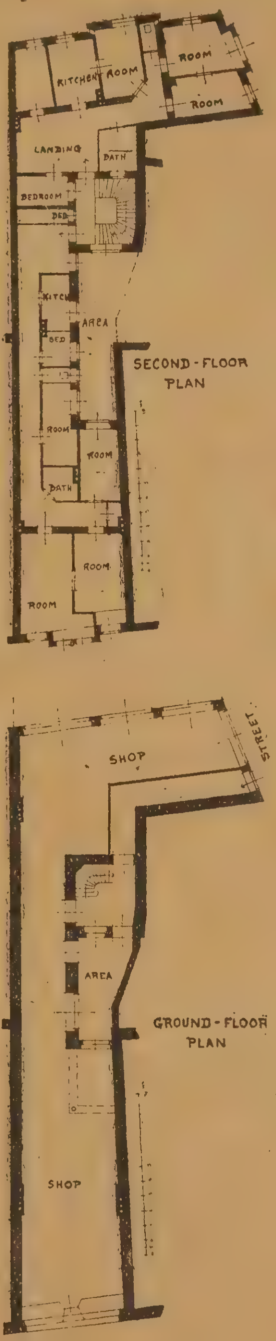
The Hogarth House Preservation Committee has just issued a circular reporting progress. To realise the end in view—viz., to preserve the house and grounds as a museum and memorial of the great satirist—a sum of £1,500 at least will be required for the purchase of and repairs to the property. Of this amount about £300 has been received or promised, and the committee appeals earnestly for further assistance, which must be prompt to be of any use, since the building is threatened with destruction or the worse fate of being let in tenements. Contingent on the fulfilment of the scheme the committee has already received promises of original paintings, prints and Hogarth relics from Lord Ronald Gower, Mr. Austin Dobson, and others, for the museum. Donations may be sent to the hon. secretary, Mr. W. H. Whitear, 4, Ravenscroft Road, Chiswick.

The Hampstead Synagogue has been enlarged from designs by Mr. Delissa Joseph, F.R.I.B.A. The enlargement has been effected by removing the east wall and setting out the building eastwards to the limit of the site, and making both nave and aisles longer. The choir, which was originally at the rear of the Ark, is now in a gallery above the Ark. The enlargement has provided for a large number of additional seats in the Synagogue. Originally there were 366 sittings on the ground floor of the building, and 299 in the gallery. The additional seats provided by the enlargement are eighty-four on the ground floor and sixty-two in the gallery, giving a total seating capacity for 811 people. A further improvement has been effected by the making of two supplementary staircases at the east end, one of which leads directly into West End Lane. The Romanesque design of the original structure has been carefully maintained, and the whole building has been decorated in pure white.

NEW CHURCH AT EAST KIRKBY.

A NEW church for the parish of East Kirkby, in the county of Notts, is being erected at a cost not to exceed £5,000, and the architect has so arranged his plans that, while building a complete church, no difficulty will be found in adding to the accommodation should future developments necessitate an enlargement. The building will consist of a nave 78ft. long and 27ft. wide internally, with aisles (merely passages 4ft. wide), a chancel 30ft. long and 21ft. wide, vestries for clergy and choir with heating chamber under, and bell turrets at the west end. The principal entrance will be at the west end facing Lowmoor Road, the highway between Nottingham and Mansfield, and an internal porch will be formed by a screen and swing doors. The style of architecture is English Gothic of the early fifteenth century, and the church is planned to accommodate about 360 adults and to admit of lateral extension by increasing the width of one or both the aisles according to future requirements. The nave and aisles are divided into five bays, with octagonal stone columns and moulded arches springing from the piers without capitals. The chancel arch will be enriched with carving. The roofs will be of open-timber construction, with hammerbeam trusses, the wood being stained dark walnut colour. The floor under the seats will be of wood blocks, and in the passages, &c., of terrazzo and marble mosaic. The walls will be of brick, with red facings and stone dressings externally, and plastered and distempered internally, except where stonework is used. The windows will be of stone, the arched heads being filled with tracery, that of the large west window being of a rich character. The glazing will be of leaded cathedral glass, in small quarries. The roofs will be covered with red tiles and the turret roofs with lead. The heating will be by means of hot water on the low-pressure system, with pipes chiefly above the floor level, and occasional radiators. The ventilation will be by means of hopper casements to some of the windows, and ventilating tiles in the ridge of the roof. It is intended to have the choir seats and clergy stalls of oak, and the general seating of pitch-pine stained brown. Space for an organ is provided between the chancel and vestry. The architect is Mr. Louis Ambler, F.R.I.B.A.





DWELLING-HOUSE AND SHOP IN MUNICH. M. OSTENRIEDER, ARCHITECT.

LIVERPOOL ARCHITECTS AND WORKMEN'S DWELLINGS.

"IT will be remembered," says a correspondent to the "Liverpool Post," "that after the very expensive experiment made by the committee in the Victoria Square blocks, local architects were invited to compete for others on the sites adjoining, the selection to be left to the late Mr. Waterhouse, R.A. This was done, the work carried out, and, I see from the Corporation accounts, with a very largely increased return on the amount expended. Notwithstanding this experience the committee renewed their building by their own staff, and their latest effort was announced at the last council meeting, to the tune of 8d. or 9d. per cube ft., or nearly double the rate proved necessary by the competition, at which the members naturally took fright, and a return to competition was suggested. If rumour is to be believed, it is now proposed that the plans be thrown open to general competition, and a premium of £250 offered, which I venture to say would be a ridiculous waste of public money for such simple plans as are required; whilst to go out of our city for competitors for it would be leaving those whose local knowledge and experience we require in an especial manner, on the off-chance of getting we know not what from outsiders, who have neither one nor the other, and no practical acquaintance with the local prices upon which everything depends."

THE NEW PUBLIC OFFICES,

Professor Aitchison and the Official "Defence."

IN a letter to the "Times" Professor Aitchison says: I do not think the public who understand the matter will join in your correspondent's pæan at Brydon's offices being handed over to the Office of Works (see our issue for last week), nor think that the character of our public architecture will be improved by it.

Can anyone be surprised that no architect of eminence would undertake to carry out the work on the undertaking of keeping exactly to Brydon's sketch? Brydon would certainly not have done so, but would have carefully studied each portion again, so as to bring them and the whole to perfection, while every moulding and detail would have been drawn by his own hand. I do not believe that the architects of England are less patriotic than the Italians of the sixteenth century, for though the design for St. Peter's was Bramante's it had to be carried out by others after his death—by B. Peruzzi, by Raffael, Giuliano da San Gallo, Fra Giacondo, Antonio da San Gallo the younger, Michelangelo, Giacomo della Porta, and Vignola—before its final alteration by Carlo Maderno, and Michelangelo made a great point of carrying out Bramante's work in its original spirit.

The letter of your correspondent is admirably written to throw dust into the eyes of the public; all sorts of incongruous subjects are introduced, including the widening of Piccadilly.

The bad arrangement of the Treasury, which was built or altered by Soane and refronted by Barry, when lighting and ventilation were in their infancy, is pointed to, and it is insinuated by this that independent architects are incompetent to deal with planning, lighting and ventilation; and though every architect would necessarily consult the heads of each department as to the arrangements they require, it is suggested that the Office of Works understand their wants better than they do themselves.

It is doubtless convenient to be able to hand over our public buildings to a department and to have no further trouble till the final fiasco. What the public should consider is whether the finest possible building will result from it. The officers and clerks of the Public Works Department are already overworked, and beyond their ordinary work they have an elaborate building to look after, the War Office, and they are now again asked to give a part of their spare time, which is all they have to give, to the perfecting of another large building, and one of the most important of our time; and the verdict upon this will not only be given by English, but by French, Italian, German, Austrian and American architects.

It is too late, I fear, to rescue the War Office, but there is time to rescue Brydon's offices from the clutches of the Office of Works.

The residue of the architect's fees will necessarily go to repay the officers and clerks of the Office of Work for their extra work; and who could object, if they were the proper persons to do it? But I think I have shown that they are not, nor is it to be expected from overworked men, who have only a small portion of their spare time to devote to it.

Views & Reviews.

Two Cathedrals.

These are the latest additions to Bell's "Cathedral Series." It is a deplorable fatality that the history of our great cathedrals should include such a disastrous record of restoration, though there is some relief in the fact that the days of those ardent enthusiasts at reconstruction are past and for the present the matter is more reverentially handled. Bristol Cathedral, though one of the least important, possesses many features of interest. The Elder Lady Chapel on the north side of the north aisle is the chief specimen remaining of the Early English work. It was altered by the insertion of a larger east window towards the end of the twelfth century by Edmund de Knowle, who, when he became abbot, made great additions to the building; in fact, it is to him we owe the eastern half of the fabric, which was so well carried out that it has needed no restoring internally, and seems as structurally sound now as it was when completed. Abbot Snow, who succeeded Knowle, has been credited with extensive building operations, but it is difficult to see what he did. Work in earnest began with Abbot Newbury, being continued by the succeeding abbotts Hunt and Newland. From these early days there is little to chronicle till we reach the "restoration" period; then too many facts confront us. Dean Elliott planned a reseating of the cathedral, and with the aid of Sir Gilbert Scott and Messrs. Pope & Bindon alterations were effected which resulted in the total destruction of the organ screen of 1540, partial destruction of the stalls, and the insertion of an entirely new screen, "insipid in character," across the eastern arch of the tower. In 1888 the Abbey Gateway was restored by Mr. Pearson, who succeeded Mr. Street as architect to the chapter; the north transept was "thoroughly restored" two years later; and shortly afterwards the Early English Lady Chapel and the tower were restored. Practically half of the length of the exterior is new, and the other half has already been or is about to go through a severe course of restoration. One more note and we may conclude these remarks on Bristol Cathedral. There used to be an eagle lectern of good honest work which was given to the cathedral in 1683. In 1800 this was sold for £27 (a sum less than its present price as mere metal), and a modern "art" one of the highest possible finish and enhanced by pieces of coloured glass was introduced. It is said to have cost £150. The old one was given to the church of St. Mary le Port *for ever!*

The second book deals with Ely Cathedral, which, for external grandeur of effect, few would dispute to be surpassed in England only by Durham and Lincoln. Ely stands on an eminence, and can be seen well from the town of Peterborough, about thirty-five miles away as the crow flies. In Professor Freeman's words, "The first glimpse of Ely overwhelms us, not only by its stateliness and variety of its outline, but by its utter strangeness, its unlikeness to anything else. Ely . . . with its vast single western tower, with its central octagon, unlike anything else in the whole world, has an outline altogether peculiar to itself." The history of the building has already been the subject of numerous writings, and we do not intend to enlarge on the matter now. Needless to say, it has a record of restoration like the rest.

Both works are excellently produced, the illustrations, though small, being clearly printed. Mr. Massé's is, however, the more carefully written of the two.

"The Cathedral Church of Bristol," by H. J. L. J. Massé, M.A.; "The Cathedral Church of Ely," by the Rev. W. D. Sweeting, M.A. London: George Bell & Sons; price 1s. 6d. nett each.

COMING EVENTS.

Wednesday, September 18.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, B.A., M.D., on "Duties of a Sanitary Inspector—Outdoor," 7 p.m.

Friday, September 20.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, B.A., M.D., on "Duties of a Sanitary Inspector—In door," 7 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Examination qualifying for admission to Institute (First day).

Saturday, September 21.

INSTITUTE OF SANITARY ENGINEERS.—Examination qualifying for admission to Institute (Second day).

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Sunderland: The Pier Works, Messrs. Botterell & Roche's New Offices (Messrs. Henderson & Hall, architects), and New Board Schools (Messrs. Barnes & Coates, architects).

Tuesday, September 24.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.)—Mr. J. Priestley, B.A., M.D., on "Duties of a Sanitary Inspector: Offensive Trades and Trade Nuisances," 7 p.m.

Thursday, September 26.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. Henry R. Kenwood, M.B., D.P.H., on "Infectious Diseases," 7 p.m.

Friday, September 27.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. Henry R. Kenwood, M.B., D.P.H., on "Methods of Disinfection," 7 p.m.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Sept.	20	Letterkenny—Diocesan Schools	Most Rev. Dr. O'Donnell	M. O'Callaghan, Main Street, Letterkenny.
„	21	Ince, near Wigan, Lancs—Public Offices	Urban District Council	Heaton, Ralph & Heaton, Architects, Wigan.
„	21	Dorchester—Works	Trustees of Municipal Charities	A. L. T. Tilley, Architect, Dorchester.
„	21	Mynachlogddu, Pembrokeshire—Schoolroom and House	School Board	W. J. Williams, 1 High Street, Cardigan.
„	21	Ashford, Kent—Additions, &c., to Schools	School Board	Jeffrey & Lacey, Architects, Ashford, Kent.
„	21	Banff, Scotland—Boiler House	District Lunacy Board	J. Morrison, Solicitor, Banff.
„	22	Whaley Thorns, near Langwith—Schools	Bolsover School Board	Vallance & Westwick, Architects, Mansfield.
„	23	Newcastle-under-Lyme, Staffs—Alterations at Workhouse.	Union Guardians	Chapman & Snape, Architects, Newcastle-under-Lyme.
„	23	Leeds—Coal Stores	City Council	R. H. Townsley, Gas Offices, Dewsbury Road, Leeds.
„	23	Barnstaple—Extension of Imperial Hotel	———	W. C. Oliver, Architect, Bridge End, Barnstaple.
„	23	London, S.E.—Pulling Down, &c.	Bermondsey Borough Council	Borough Surveyor, Town Hall, Spa Road, Bermondsey.
„	23	Tyldesley, Lancs—Shed	Urban District Council	Engineer, Gasworks, Tyldesley.
„	23	Great Harwood—Slaughter-houses	Industrial Co.-op. Provision Soc., Ltd.	J. B. Thornley, Architect, Market Street, Darwen.
„	24	Bromley, Middlesex—Alterations, &c., to Asylum Mortuary.	Poplar and Stepney Asylums Managers	J. & S. F. Clarkson, 136 High Street, Poplar, E.
„	24	Trealaw, Wales—Twenty to Thirty Cottages	New Century Building Club	A. O. Evans, Architect, Pontypridd.
„	24	Field Broughton—Vicarage	———	Wright & Son, Surveyors, Lancaster.
„	24	London, N.W.—Generating Station, &c.	Willesden District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
„	24	Norham, near Berwick-on-Tweed—Villa	———	J. L. M. Sherriff, East House, Norham.
„	24	Walthamstow—Cookery-room, Cloakroom, &c., at Schools.	School Board	H. Prosser, Architect, Board's Offices, High Street, Walthamstow.
„	24	West Ham—Underground Sanitary Convenience	Corporation	Borough Engineer, Town Hall, West Ham, E.
„	24	Nottingham—Rebuilding Inn	Joint Station Committee	O. S. Holt, Secretary, London Road Station, Manchester.
„	24	Middlesbrough—Gasholder Tank, Foundations, &c.	Gas Committee	D. Terrace, Manager, Gasworks, Middlesbrough.
„	24	Belfast—Additions to Workhouse	Union Guardians	J. C. Neeson, Clerk, Union Workhouse, Belfast.
„	25	Werneth, Oldham—Cotton Shed	Lancashire & Yorkshire Railway Co.	Engineer, Hunt's Bank, Manchester.
„	25	Grassenhall, Norfolk—Alterations, &c.	Union Guardians	J. B. Pearce, Architect, Upper King Street, Norwich.
„	26	Burry Port, Wales—Schools, &c.	Pembrey School Board	R. Williams, Architect, Burry Port.
„	26	London, S.E.—Wall	Lewisham Borough Council	Surveyor, Town Hall, Catford.
„	26	Rainhill, Lancs—Additions, &c., to Asylum	Lancashire Asylums Board	J. Gornall, Clerk, County Asylum, Rainhill.
„	26	Ballymoney—Additions to Workhouse	Union Guardians	T. B. Hamilton, Clerk, Boardroom, Ballymoney.
„	27	Kildwick—Restoration of Church	———	Wright & Son, Surveyors, Lancaster.
„	27	Pellon, Halifax—Fourteen Houses, &c.	———	M. Hall, 29 Northgate, Halifax.
„	27	Whitstable, Kent—Coastguard Buildings	Admiralty	Director of Works Department, Admiralty, 21 Northumberland Avenue, W.C.
„	28	Blackpool—Additions to Destructor Works	Cleansing Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
„	28	Castleisland, Ireland—Tower and Spire of R.C. Church	———	D. J. Coakley, Architect, Cork.
„	30	Bristol—Infants' School and Class Centre	School Board	P. Munro & Son, 6 St. Stephen's Chambers, Baldwin Street, Bristol.
„	30	Glasgow—Reconstruction of Buildings	Caledonian Railway Company	J. Miller, 15 Blythswood Square, Glasgow.
„	30	Hornsea, Yorks—Cemetery Fencing	Urban District Council	W. G. Warburton, Surveyor, Public Rooms, Hornsea.
„	30	Hounslow—Twenty-two Workmen's Houses	Urban District Council	P. G. Parkman, Engineer to Council, Town Hall, Hounslow.
„	30	Menston, Yorks—Isolation Hospital	———	C. V. Newstead, Clerk, Union Offices, Otley.
Oct.	1	Carrickfergus, Ireland—Repairs to Houses	Governors of Shiels's Institution	Superintendent, Shiels's Institution, Carrickfergus.
„	1	Great Yarmouth—Cemetery Chapel, &c.	Town Council	J. W. Cockrill, Borough Surveyor, Town Hall, Great Yarmouth.
„	2	Brynmawr, Wales—School	School Board	F. Baldwin, 13 Frogmore Street, Abergavenny.
		ENGINEERING:		
Sept.	20	Calais—Locks and Aqueduct	———	M. Thanneur, Ingénieur-en-Chef, à Boulange-sur-Mer.
„	20	Ossett, Yorks—Waterwheel, &c., for Treating Sewage	Corporation	M. Paterson & S. Shaw, 35 Manor Row, Bradford.
„	20	Salford—Lighting Generating Station	Corporation	Lacy, Airehugh & Sillar, 2 Queen Anne's Gate, Westminster.
„	21	Buxton—Works	Gas Committee	H. Barker, Gas Engineer, Town Hall, Buxton.
„	21	Blackpool—Tramway Carriages	Tramways Committee	J. Lancaster, Manager, Blundell Street, Blackpool.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*cont.*:		
„ 21	Newport, Mon—Winches, Cables, Overhead Construction, &c.	Corporation	H. F. Parshall, 8 Princes Street, Bank, E.C.
„ 23	Maidenhead—Electric Lighting Plant	Corporation	Burstall & Monkhouse, 14 Old Queen Street, Westminster, S.W.
„ 23	Portland—Service Reservoir	Urban District Council	E. J. Elford, Engineer, Council Offices, New Road, Portland.
„ 25	Cardiff—Widening and Reconstructing Bridges	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 25	Denny, Scotland—Storage Reservoir	—	Kyle & Frew, 140 West George Street, Glasgow.
„ 25	Christiania—Passenger Coaches	Norwegian State Railways Department	Commercial Department, Foreign Office, S.W.
„ 25	Glasgow—Electric Cables	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 25	Bury, Lancs—Refrigerating, &c., Plant	Health Committee	A. Neill, 18 Coleridge Street, Leeds.
„ 25	Dartford—Kitchen Fittings	Metropolitan Asylums Board	A. & C. Harston, 15 Leadenhall Street, E.C.
„ 25	Middlesbrough—Pumping Engines	Sanitary Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
„ 25	Havana—Sewerage System, &c.	—	Lieutenant W. J. Barden, Chief Engineer, City of Havana.
„ 26	Gateshead—Timber Staith	Health Committee	Borough Engineer, Town Hall, Gateshead.
„ 26	Bude, Cornwall—Waterworks	Stratton and Bude Urban District Council	B. Latham, Parliament Mansions, Victoria Street, Westminster.
„ 26	Hull—Steam Engines and Boilers	Electric Lighting Committee	T. G Milner, City Treasurer, Town Hall, Hull.
„ 27	Conway—Water Main	General Purposes Committee	Borough Engineer, Town Hall, Conway.
„ 28	Lutterworth—Sewage Outfall, &c., Works	Rural District Council	W. H. Simpson, Civil Engineer, The Corridor Chambers, Market Place, Leicester.
„ 28	Reading—Tramways	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
„ 30	Rio de Janeiro—Docks	Brazilian Minister of Industry and Public Works.	Commercial Department, Foreign Office, S.W.
„ 30	Listowel—Electric Lighting Scheme	Urban District Council	E. J. Gleeson, Clerk, Listowel.
„ 30	Sheffield—Electric Plant	Corporation	S. E. Fedden, General Manager, Commercial Street, Sheffield.
„ 30	London, S.E.—Paving, Flag-making Plant	Bermondsey Borough Council	Engineer, Town Hall, Spa Road, Bermondsey.
Oct. 1	Hadsund, Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes Kōntor, Reventlowsgade, 10 Copenhagen, B.
„ 1	Leicester—Pumping Machinery	Corporation	E. G. Mawbey, Borough Engineer & Surveyor, Town Hall, Leicester.
„ 1	Banff—Water and Drainage Works	District Committee	J. Barron, 1 Bon Accord Street, Aberdeen.
„ 1	Bradford-on-Avon—Pipe Sewers	Urban District Council	S. Howard, Surveyor, Town Hall, Bradford-on-Avon.
„ 2	Christiania—Turntables	Norwegian State Railways Department	Commercial Department, Foreign Office, S.W.
„ 2	Littlehampton—Pumping Plant	Urban District Council	W. Howard, Engineer, Town Offices, Littlehampton.
„ 5	Monaghan—Waterworks	Urban District Council	J. L. Devenish-Meares, Town Hall, Newry.
„ 5	Bideford—Sewers, Water Main, &c.	Corporation	B. Lasham, Parliament Mansions, Victoria Street, Westminster.
„ 8	Leeds—Switchboard	Lighting Committee	H. Dickinson, 1 Whitehall Road, Leeds.
„ 8	London, S.W.—Electric Lifts, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 8	London, S.W.—Tramways	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 8	London, S.W.—Continuous Current Plant	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 15	Fishguard, Pembrokeshire—Extension of Pier	Railways and Harbours Company	Secretary, Paddington Station, London.
Dec. 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works, Sydney.
	IRON AND STEEL:		
Sept. 20	London, W.C.—Rails, &c.	British Electric Traction Co., Ltd.	Chief Engineer of the Co., Donington House, Norfolk St., Lon., W.C.
„ 21	Blackpool—Tramway Materials	Tramways Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
„ 26	London, E.C.—Railway Stores	Great Indian Peninsula Railway Company	J. I. Berry, Secretary, Copthall House, Copthall Avenue, E.C.
„ 26	London, S.E.—Iron Fencing	—	Surveyor, Town Hall, Catford.
Oct. 1	Alexandria, Egypt—Mooring Chains	Administration of Ports and Lighthouses	Controller-General of Ports and Lighthouses, Alexandria.
	PAINTING AND PLUMBING:		
Sept. 24	Dagenham, Essex—Painting at Hospital	West Ham Corporation	Borough Engineer, Town Hall, West Ham, E.
Oct. 14	Knutsford—Painting and Limewashing	Bucklow Union Guardians	R. J. McBeatt, Architect, Birnam House, Sale.
	ROADS AND CARTAGE:		
Sept. 20	Lewes—Making-up Roads	Town Council	Borough Surveyor, Town Hall, Lewes.
„ 20	Newton-in-Wakefield—Materials	Urban District Council	Surveyor, Town Hall, Earlestown.
„ 23	Otley, Yorks—Levelling Land, &c.	Urban District Council	J. E. Sharpe, Surveyor, Council Offices, Otley.
„ 23	Guildford—Broken Granite	Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford.
„ 23	Kingston-upon-Thames—Road Works	Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames.
„ 23	Reigate—Road	Corporation	F. T. Clayton, Borough Surveyor, Market Hall, Redhill.
„ 24	Moffat, Scotland – Alteration to Roadway, &c.	Joint Bridge Committee	W. Tait, Town Clerk, Moffat.
„ 24	West Ham—Making-up Struts	Corporation	Borough Engineer, Town Hall, West Ham, E.
„ 24	London, N.—Kerbing, Channelling, &c.	Tottenham Urban District Council	W. H. Prescott, 412 High Road, Tottenham, N.
„ 24	Bootle—Private Improvement Works	Corporation	Borough Engineer, Town Hall, Bootle.
„ 25	Middlesbrough—Paving	Streets Committee	F. Baker, Borough Engineer, Municipal Buildings, Middlesbrough.
„ 25	London, N.—Making-up Roads	Wood Green Urban District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green.
„ 27	London, N.—New Roads	—	Vigers & Co., 4 Frederick's Place, Old Jewry, E.C.
„ 28	Witham, Essex—Indulated Stone-Paving	Urban District Council	W. P. Perkins, Surveyor, Witham.
„ 30	Heaton Norris—Granite Setts	Urban District Council	W. Hodson, Clerk, Council Offices, Heaton Moor, Stockport.
Oct. 1	London, S.W.—Footpaths	Middlesex County Council	H. T. Wakelam, County Surveyor, Guildhall, Westminster.
Oct. 2	Sunderland—Road	Corporation	Surveyor, Town Hall, Sunderland.
	SANITARY;		
Sept. 20	Durham—Cleaning Ashbins	Corporation	City Surveyor, Market Place, Durham.
„ 20	Failsworth, Lancs—Removal of Night Soil	Urban District Council	Inspector of Nuisances, Council Offices, Failsworth.
21	Bollington, Cheshire – Sewer, &c.	Urban District Council	S. Knight, Clerk, Council Offices, Bollington.
„ 24	Hallaton, near Uppingham—Sewerage Works	Rural District Council	Coates & Johnson, Engineers, Bank Chambers, Market Harborough.
„ 25	Marlborough, Wilts—Sewers, &c.	Town Council	E. Ll. Gwillim, Town Clerk, Marlborough.
„ 27	Barnsley—Sewers, &c.	Rural District Council	J. Senior, Clerk to Parochial Committee, Carlton, near Barnsley.
„ 30	Hale, Cheshire—Sewers, &c.	Urban District Council	F. J. Lobley, Council's Engineer, Albert Road, Hale, Cheshire.
Oct. 8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
	TIMBER:		
Sept. 30	London, E.C.—Telegraph Poles, &c.	—	C. E. Stuart, Controller of Stores, General Post Office, E C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 21	Roscommon, Ireland—Cottages	—	T. J. O'Keefe, Clerk to Urban District Council, Roscommon.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
„ 21	Leeds—Public Baths at Junction of Calveley and Broad Lanes, at cost not exceeding £8,000.	£30, £20, £10 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
„ 21	Leeds—Public Baths and Branch Free Library in York Road, at cost of £15,000.	£50, £30, £15 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
„ 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
„ 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov. 15	London, N.W.—New Offices in Euston Road	£100, £75 and £50.	S. R. J. Smith, 14 York Buildings, Adelphi, London, W.C.
No Date.	Middlesbrough—Wesleyan Mission Hall, School and Classrooms.	—	W. R. Meggeson, Woodlands Road, Middlesbrough.
1902. Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

CURRENT MARKET PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 12 0	—
Clover, best	per load	4 5 0	5 10 0
Hay, best	do.	5 0	5 10 0
Sainfoin mixture ..	do.	4	5 2 6
Straw	do.	1	1 18 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 8 0	1 9 2
Colza Oil, English ..	do.	1 8 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 6 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 9 10½	—
Petroleum, American ..	per gal.	0 0 5¾	0 0 5⅞
Do. Russian ..	do.	0 0 5¼	0 0 5^{3}
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	3 19 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 6 0	1 6 6
Tar, Stockholm	per barrel	1 4 6	—
Turpentine	per cwt.	1 6 6	1 6 9

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	82 0 0	83 0 0
Iron, Staffs., bar ..	do.	6 10 0	8 10 0
Iron Galvanised Corrugated sheet ..	do.	15 0 0	—
Lead, pig, Spanish ..	do.	12 0 0	12 2 6
Do. do. English common brands	do.	12 7 6	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12 15 0	—
Do. pipe	do.	13 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 15 0	—
Do. floor brads	do.	9 10 0	—
Steel, Staffs., Girders and Angles	per ton	6 12 6	7 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	114 17 6	115 7 6
Do. English ingots ..	do.	117 0 0	118 0 0
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	16 15 0	16 17 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec Yellow ..	do.	4 7 6	6 0 0
Do. Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	9 10 0	10 15 0
Do. do. 4th & 3rd	do.	7 5 0	10 15 0
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	11 0 0	—
Do. do. 2nd „	do.	10 0 0	—
Do. do. unsorted	do.	11 0 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	8 10 0	10 5 0
Do. White Sea ..	do.	8 5 0	13 15 0
Do. Quebec Pine, 1st ..	do.	13 15 0	—
Do. do. 2nd ..	do.	11 5 0	—
Do. do. 3rd &c.	do.	9 15 0	—
Do. Canadian Spruce, 1st	do.	17 0 0	—
Do. do. 3rd & 2nd	do.	8 0 0	10 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	5 17 6	9 5 0
Flooring Boards, 1in. prepared, 1st ..	per square	0 11 6	0 13 6
Do. 2nd ..	do.	0 8 6	—
Do. 3rd &c. ..	do.	0 7 9	—

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0
Cedar, 1in., Cuba ..	per ft. sup.	0 0 $4\frac{5}{32}$	—
Do. Honduras ..	do.	0 0 3¾	—
Do. Tobasco	do.	0 0 3¾	—
Elm, Quebec	per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 $4\frac{7}{32}$	—
Do. African ..	do.	0 0 $3\frac{}{8}$	—
Do. St. Domingo	do.	0 0 6⅜	—
Do. Tobasco ..	do.	0 0 $3\frac{29}{32}$	—
Do. Cuba ..	do.	0 0 $4\frac{29}{32}$	0 0 $3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3 15 0	5 7 6
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ..	do.	6 0 0	17 10 0
Wainscot, Riga (Baulk)	do.	3 15 0	5 15 0
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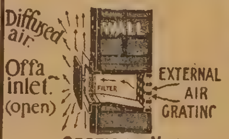
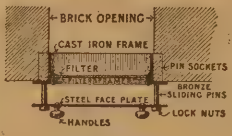


SECTIONAL VIEW.



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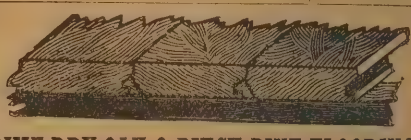

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

SEPT. 25, 1901.
No. 346.

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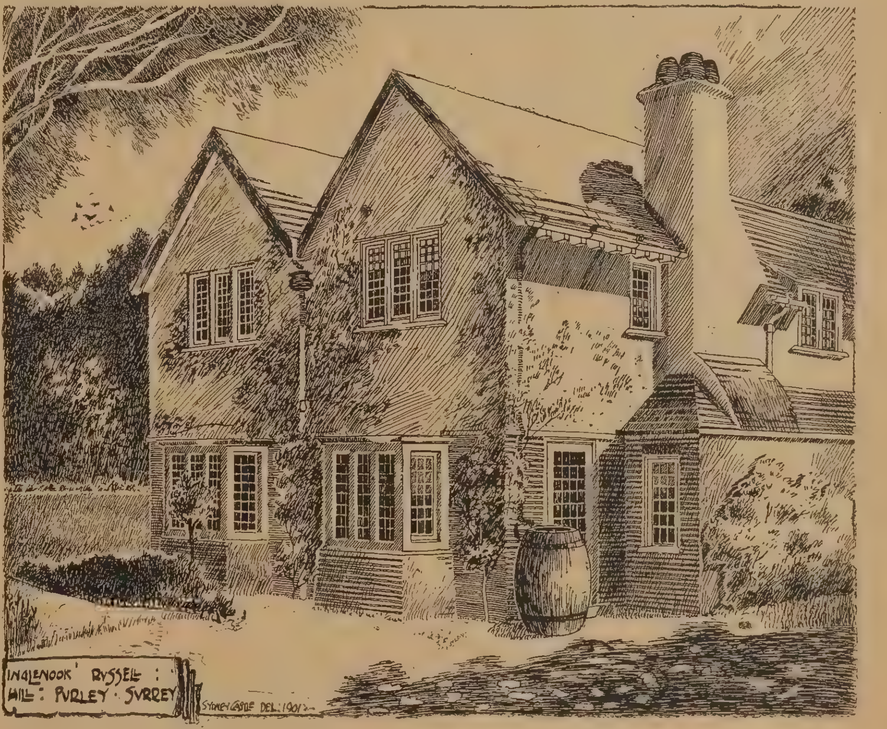
An Architectural Causerie.

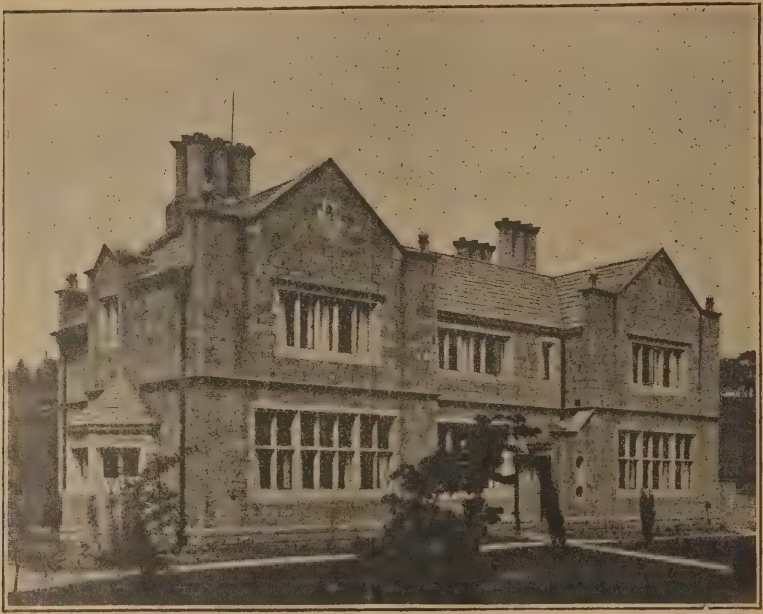
The Garden City. ON another page we publish a brief report of the important conference of the Garden City Association which was held at Birmingham last week; but it is not that we think so little of the project that the particulars given are so limited, but because we were among the first to draw public attention to the matter, and have published in numerous back numbers a plan of the proposed city and full details about its inception and development; there is, therefore, no need to repeat what has already been said. In every community there will always be found a certain number of persons who are so thoroughly satisfied with (or indifferent to) existing conditions that no doctrine appeals to them so strongly as the *laissez faire* doctrine; yet we do not think that even these would deny the urgency of finding some satisfactory solution of the housing problem. As Mr. Ralph Neville pointed out most precisely at the Garden City Conference, with physical degeneration proceeding (in some places at a most rapid rate), nothing can prevent the ultimate decadence of the race if we do not see that the mass of the people live lives which are consistent with physical development. Of course the awful truth of this has been apparent for years and years past, and most zealous efforts have been made by corporations in almost all the large towns throughout the country to arrest the evil by clearing insanitary areas and erecting huge tenements upon them; yet, however difficult any other method may be, we cannot think that this is the correct one; for it is like attempting to relieve the pressure in a dense crowd by a fierce struggling in the centre. On the other hand, the building of houses on the outskirts of cities immediately creates a fresh problem, that of transit, and with the present facilities of communication this engenders failure. In such a dilemma it seems to us that the Garden City scheme affords, at least, a measurable solution. Briefly, it is proposed that a piece of ground in the vicinity of an existing city shall be acquired and laid out so as to secure the advantages of town and country; and on the fringe of this area it is proposed that the several factories and works shall be erected, the whole being enclosed by a belt of trees. There are many difficulties to carrying out such a scheme, but they are not insuperable, and we trust that, with such stimulating experiments as those of Messrs. Lever Brothers and Messrs. Cadbury, the Garden City Association will secure their land and those manufacturers who are essential to its development. For good or ill there has been an economic change in this country from agricultural production to commercial production; we have gone from the plough to the factory. That change has taken place and is still taking place, and it is useless to attempt any solution which ignores such a change. It is futile to say to the factory hand, "You should return to the land." He does not want to return to the land, however much he may enjoy a holiday in the country. But if the manufacturers can be induced (as many have already been induced) to take their works away from the town to the country, a great opportunity offers itself to house the workers in a healthy manner. So that we commend the Garden City scheme most earnestly to our readers, believing it to be—certainly not a panacea for all the troubles—but a sensible, hygenic, and practical solution of this problem which so undermines the foundations of our national existence.

London Streets. THE County Council have just issued, through Messrs. P. S. King & Son, a list of the streets and places within the Administrative County of London. It has been compiled by the Superintending Architect of the Council, who is the authority for the naming of the thoroughfares. The volume, which is arranged alphabetically, gives the names of each street and various other particulars, together with names now abolished. Mr. G. L. Gomme, the Clerk to the Council, writes an interesting introduction on the historical significance of street names. "Probably," he says, "the oldest names are Billingsgate (corrupted from Belunsgate) and Ludgate, both, according Dr. Rhys, derived from the days of the Celtic settlement at London. Of Roman London there are apparently no relics in street names, for Watling Street is the Saxon name given to this Roman roadway. Of Saxon London there are innumerable examples. Perhaps the most interesting is a name which was threatened with destruction in the days of the Metropolitan Board of Works, and was saved by the pleading of Mr. W. J. Thoms the antiquary, who converted the Board to the importance of preserving this name; this was Tothill Street, Westminster. Another Tothill Street occurs at the lower end of Gray's Inn Road. These names record the Toot hills, intimately associated with Saxon civil administration. Another name which is already destroyed by the march of events is Wych Street, on the site of the new street from Holborn to the Strand. This is the second syllable of the name of the Danish community which settled just outside the walls of London—namely, Aldwych—and is the equivalent of the second syllable in Norwich and other Danish settlements."

A Surrey House. MR. SYDNEY CASTLE, of 22, Louvaine Road, New Wandsworth, S.W., whose drawing we publish on this page, informs us that he has been unable to ascertain the name of the architect of this house, which is situated at the top of the Russell Hills near Purley. It is treated with Broseley tiles and white rough-cast, with a red-brick base. The woodwork is painted white and the ironwork black.


INGLENOOK' RUSSELL : HILL : PURLEY · SURREY
SYDNEY CASTLE DEL: 1901

Stinging, but True. OUR readers may have become tired of the discussion apropos the new Government offices; and of a truth it is vexatious. Nevertheless, the matter is of such importance that every effort needed to be made to save the buildings from the Office of Works. In the course of the discussion no more pungent criticism has appeared than that of Mr. Leonard Stokes which we publish on page 104 of this issue. Even though it be thought that the Office of Works intend, willy-nilly, to complete the buildings, this letter is worth reading for its militant humour. It is the most interesting contribution which has been made to the discussion.



HOUSE AT BAILDON, YORKS: GARDEN FRONT. ADKIN AND HILL, ARCHITECTS.

MODERN HOUSES IN YORKSHIRE.

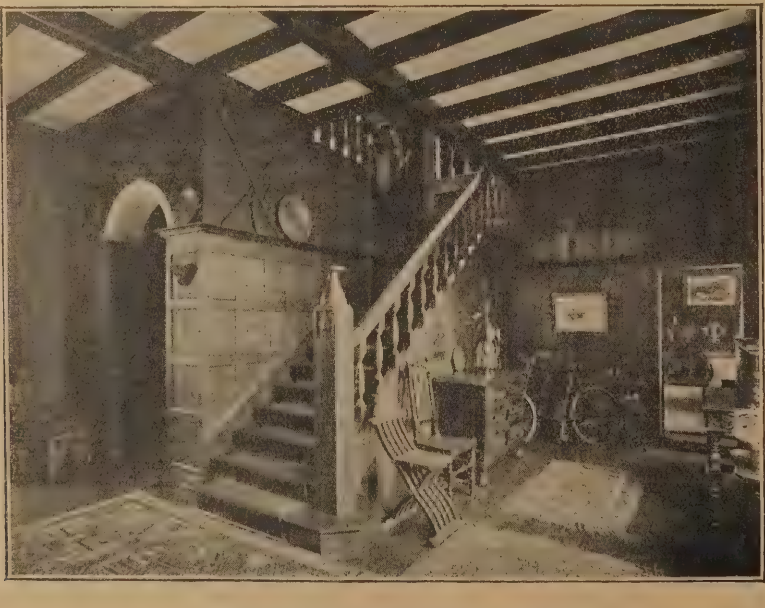
THE following particulars are given in connection with the several houses by Messrs. Adkin & Hill, architects, of Bradford, which we illustrate this week :—

House at Burley-in-Wharfedale.—This house, for Mr. J. Benn, is built of local sandstone lined with brick. The exterior above the first-floor level is of rough-cast or tile-hung. The tiles are specially selected (brindled) as to colour in order to avoid the hard boiler-plate appearance of the usual samples. The oakwork throughout is fumed dark and left with a dull surface. The house is two-storeyed with the exception of the servants' attic over the north wing. The kitchen is of one storey only. The cost works out at 6d. per foot cube, including all fittings.

House at Baildon.—This house, for Mr. J. Ambler, is built of local sandstone evenly punched. The roof is of stone slates. The oakwork throughout is fumed dark and oiled. The house has no cellars and the small attic accommodates the servants and has a box and cistern room. Attention is called to the fact that the servant can answer the front door without entering the hall. The cost works out at 7d. per foot cube, including all fittings.

Houses at Heaton, Bradford.—These houses are built of local common hammer-dressed wallstones to the height of the first floor, then tile-hung up to eaves. The dining-room is covered with a bright red wallpaper, and the chairs are in red leather of the same tone. The frieze is white and the beams vandyke brown. The sgraffito work to fireplace was designed and executed by Mr. W. P. Rowe, of Leeds. The cost is 6d. per foot cube, all fittings included.

Residence at Ilkley.—This house, for Mr. F. B. Muff, is built on a very narrow site, which considerably influenced the planning. The chief points secured in the design are : the easy access of the domestics to the front entrance without passing across the hall; the approach to the children's quarters by either entrance, without encroachment on the portion of the house given up to the use of the seniors; and the orientation of the different rooms. The basement contains the larder and laundry; the nurseries, &c., are on the second floor. Local sandstone is used for the outer walls, timber and rough-cast being introduced on the upper floors. The roof is tiled. The cost cubes out at 6½d. per foot.



THE HALL, HOUSE AT BAILDON, YORKS.

THE PRESERVATION OF STONEHENGE.

UNDERPINNING THE STONES.

SIR EDMUND ANTROBUS is now having the recommendations carried out which were made by the committee representing the Society of Antiquaries, the Wilts Archæological Society, and the Society for the Protection of Ancient Monuments, whom he invited to advise him as to the best steps to be taken for the preservation of Stonehenge and the prevention of further falls such as occurred on the last day of 1900.

The committee, among other things, recommended that measures should be taken to raise the tallest stone of all at Stonehenge—the huge monolith which overhangs the altar stone, and which, with the exception of Cleopatra's Needle, is the largest and finest monolith in England—to a perpendicular or nearly perpendicular position, and to underpin its base with concrete. This stone is leaning at a dangerous angle, its foundations having been weakened by the diggings made by the Duke of Buckingham in 1620, but it rests on a smaller stone. There are, however, two large vents or cracks in the great monolith, and it was feared that wet getting into these cracks, and the action of frost, would cause them to extend, so that if the stone were to fall it would be broken into three pieces.

The preparations for raising this stone are being carried out under the supervision of Mr. Detmar Blow, who is acting as professional adviser and architect to Sir Edmund Antrobus; and Dr. Gowland, professor of mineralogy at the Royal College of Science. The first steps taken were the cradling of the stone in a framework of timber to prevent it from cracking while being raised and the carrying of stout ropes from the stone to two winches which now support the monolith, and by means of which the raising will be effected. Before the stone is raised, however, part of the bed of concrete by which it is to be under-pinned will be placed in position, and excavations are now being made for this purpose. The excavations have been commenced on the south-east side of the stone and are being conducted in the most careful and systematic manner. A careful survey of the surface was made; and, when the concrete bed, the top of which will be about 18in. below the ground level, has been completed, the turf will be replaced in exactly the original position. The excavations will be made in sections, concrete being placed in one section before the other is commenced, so that the stone will be supported as far as possible. It is thought that the work may possibly furnish some data from which a clue might be obtained to assist in the clearing up of that prehistoric mystery—the age of the stones and how they were squared, and the mortices and tenons wrought. Dr. Gowland has found a large number of palæolithic implements and some sarsen and syenite chippings and it is thought that these discoveries clearly point to the fact that the monument dates back to the Stone Age and that the stones were partly if not wholly, dressed on the spot. The tools found consist of hammers and axes and some of them are remarkably well formed. These are the first stone implements which have been found in the immediate vicinity of Stonehenge. When research was made in the barrows in the district, sarsen stone chippings and bronze tools were found, and from these the opinion was formed by many that the stones were erected by a bronze-using people. A thorough examination of the soil is being made, every particle of earth being minutely inspected. A plan is made, divided into longitudinal and transverse sections, each of which is numbered and lettered, so that the exact locality of any find can be accurately determined. The soil as it is dug out is sifted through a series of graduated sieves, and the results of the siftings are examined by Dr. Gowland, who remains at Stonehenge all day. It was found that there were rabbit burrows close to the stone, and these would of course loosen the earth, and probably in time cause a further subsidence.

The bottom of the stone has been reached at a depth of 8ft. 6in. When the underpinning has been accomplished the safety of the stone, it is considered, will be ensured for hundreds of years to come.

After the tallest stone has been raised and supported, excavations will be made round one of the trilithons in the outer circle, on the Amsbury side of Stonehenge and near the tallest stone. This trilithon is thought to be in an unsafe condition, and will be supported by a subterranean bed of concrete in the same way as the monolith; but the position of the two uprights will not be altered in any way.

The present operations will probably occupy about two months. Sir Edmund Antrobus's object is simply the conservation of the stones; it is not intended to attempt a work of restoration based on any conception of what the original condition of Stonehenge may have been.

OXTON CHURCH.

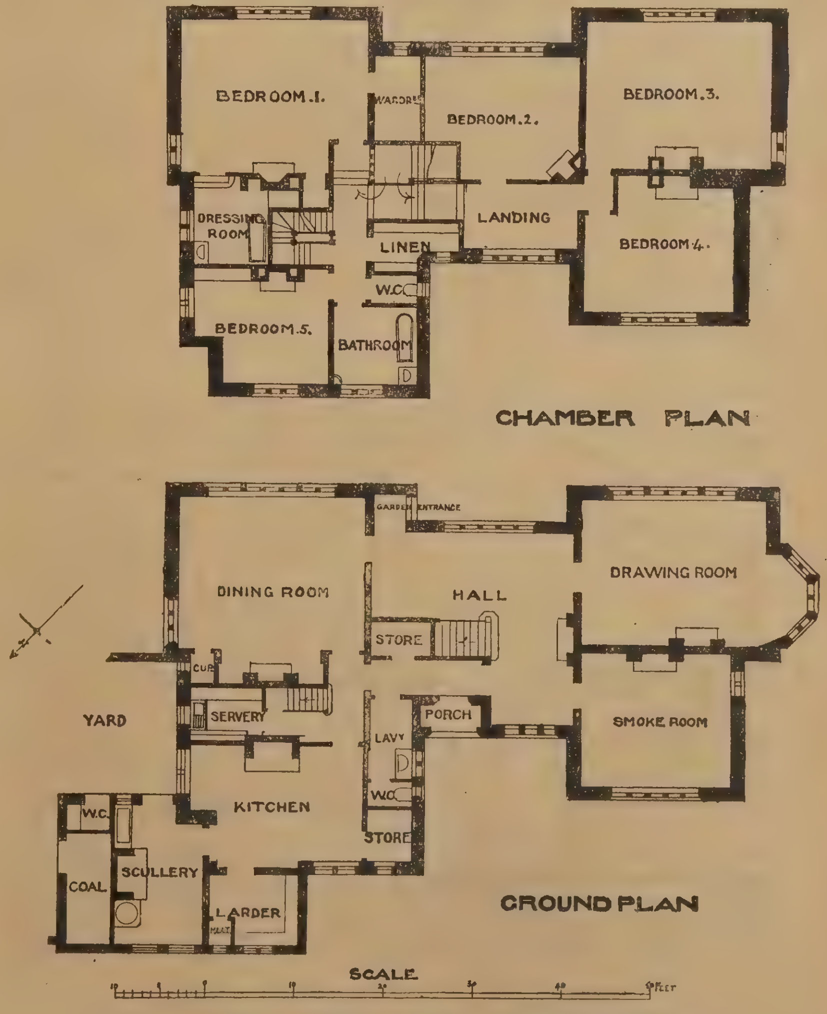
THE ancient parish church of Oxton, after undergoing a thorough and extensive restoration, has been reopened. The quaint and interesting appearance of the edifice has been successfully preserved, and where additions have been made they have been executed in keeping with the prevalent style of architecture. The church, which has undergone a number of restorations, dates back to a remote period and boasts registers commencing in 1558. The tower has now been pointed in cement within and without as far as the projecting ridge of stone, to which the ivy then reached, but the ivy was not disturbed. All defective stones have been made good. The old lead roof was entirely stripped off, and a new lead roof substituted. Defective woodwork was removed from the tower roof and oak beams have been inserted. The floor of the belfry or clock-loft was found to be decayed and replaced by a new English oak floor. The window lattices have been renewed and bird guards added. The steps leading to the tower have most of them been remade in cement. The pinnacles were not restored. When the plaster was removed the whole of the north side was found to be in a deplorable state, incapable of restoration. The wall, which had been built without a foundation, was pulled down as well as an unsightly, small, red brick north porch. The north wall has been re-erected, using the old materials on a 3ft. concrete foundation. As there was no vestry in the church opportunity has been taken to extend the north wall so as to provide for the erection of the present vestry and organ-chamber. To allow of this an old square window, said to be of no architectural value, was not replaced. The small window, said to be from Saxon times and which was high up in the wall, has been moved to its present position. The present north porch has also been added. The north wall of the chancel, as already indicated, was rebuilt; the east window, which was completely awry, straightened, and defective stonework made good, the east wall not being interfered with. The chancel had an inner ceiling which in part hid the east window. This ceiling has been removed and the chancel opened out. The plaster has been taken off the walls, showing the priest's door, the blind window above it and the aumbry. These have been opened out and the walls replastered. It may be stated that the church walls, being built of rubble, could not be pointed inside and had to be replastered. No piscina was found. It was expected that the north roof would be found in a bad state, but this was not the case. The architect decided, therefore, to keep the present barn-roof, and the few defective beams were replaced by new ones. The entire church roof was thoroughly examined. The slates, which had been fastened by wooden pegs, have been relaid and fastened with metallic nails; defective stone ridges have been removed and replaced by new. New spouting is fixed throughout. The four windows in the chancel, the window in the vestry and the window in the north side have had their stonework repaired and the glass set in new lead flashings. In the case of the other five windows the glass has been renewed where broken. Much of the stonework and the whole of the lead flashings of these windows is in/a very defective condition. As to the interior, the stonework, the arches and the pillars of the church were covered with disfiguring paint or distemper. This has been hacked off and the stonework exposed. All defective stonework has been made good and the joints pointed in cement. This restoration has greatly improved the appearance of the church. The pews, during the restoration, received a good deal of injury but were restained and varnished in 1900 in dark oak colour. The lighting has been much improved by the addition of 100-candle-power brass lamps, and new stoves have been put in for heating. The holy table and reredos are the gift of Mr. William Hill Foster, builder, of Southport. They are in massive carved oak. The stained deal holy table of 1842 has been removed and the present holy table substituted. About the same time the two chancel chairs, in oak, and a new carpet were added. The organ, which proviously had stood in the north aisle, has been retuned and moved to the new organ chamber. The chancel pews and panelling, placed in 1842, have been taken away and chairs substituted and arranged to receive the choir. The pulpit has been remodelled and repaired, rendering it almost new. The carved panels of the pulpit are the work of a previous vicar, the Rev. H. Tibbs. The polished oak chair at the reading-desk is the gift of Mr. Foster; and the oak lectern of Mr. Reeve, estate carpenter, who also made the reading-desk. The churchyard wall has also received considerable attention. The work has cost about £1,200.

THE PROTECTION OF WESTMINSTER ABBEY FROM LIGHTNING.

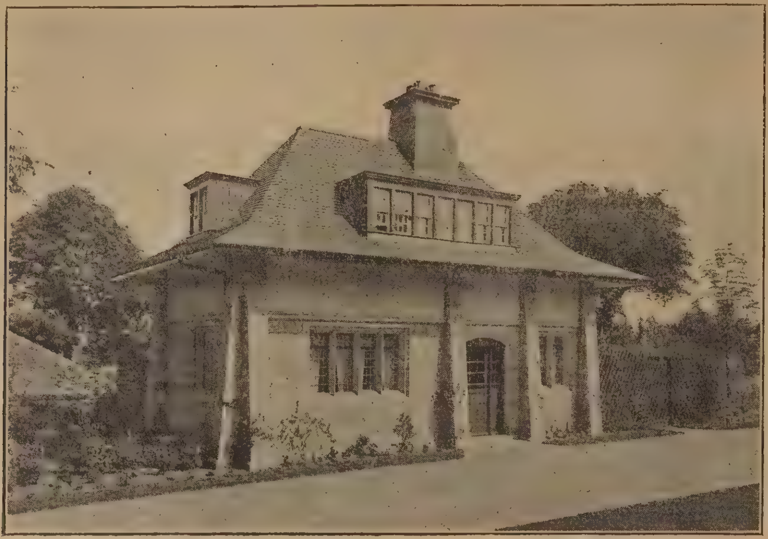
MR. KILLINGWORTH HEDGES, C.E., was some time ago asked to report on the arrangements hitherto made for protecting Westminster Abbey against lightning. As in the case of St. Paul's Cathedral, he found that the number of conductors was quite inadequate to the size of the building, and that they were not even in a satisfactory condition. He was, therefore, instructed to design a new system. This is now complete, and with the exception of the Chapter House—upon which the Office of Works, as the custodian, was unwilling to spend the small sum required to provide the necessary cable—the buildings of the Abbey are now, perhaps, as well protected as possible against the dangers of lightning.

The installation provided by Mr. Hedges is on the air-to-earth system, and consists of ⅜-in. seven-strand copper cables, which are carried horizontally along the apex of the roof of the nave and transepts and continued over Henry the Seventh's Chapel. From these cables are led similar conductors to the towers, lantern and other higher parts, and thence downward to the earth, the conductor being strained through special holdfasts, at a distance of about 6in. from the structure. The horizontal conductors are furnished with about thirty four-point aigrettes, fixed about 30ft. apart. Each aigrette is made of four pieces of solid copper and is united to the conductor by means of a special joint box containing pockets, in which the rods and cable are placed. The box is afterwards filled up with solder. All the joints are similarly finished, and it is considered that they may reasonably be expected to last as long as the cables, while the electrical conductivity of such joints is not likely to be lessened, as it would be in the case of ordinary joint soldering.

Westminster Abbey is built on sand of a particularly dry nature. Therefore, to obtain slow resistance, a small pipe has been laid from the earth to the nearest rainwater spout, and so placed that rainwater will be deviated in sufficient quantity to keep the charcoal moist in dry seasons. The tubulous earth—first used at St. Paul's Cathedral—was employed in some cases where there was not space enough to lay a copperplate. A ¼-in. solid copper wire protects each of the pinnacles by which the structure is surrounded, the wire being attached to a small general conductor laid horizontally on the lowest roof and connected with the lead roofing. The object of this arrangement is, first, to assist the dispersion of the so-called "negative" electricity collected at numerous points on the building; and, secondly, to provide so many good conductors to earth that, should any portion of the structure receive a direct lightning stroke—no matter what side flashing or surging might take place—the danger to the edifice would not be serious if the earthing arrangements were always kept in order. This important work has been carried out by the Abbey staff, under the direction of Mr. Hedges, acting as Consulting Engineer.



HOUSE AT BAILDON, YORKS. ADKIN AND HILL, ARCHITECTS.



LODGE AT BURLEY-IN-WHARFEDALE. ADKIN AND HILL, ARCHITECTS.

THE NEW GOVERNMENT OFFICES.

Mr. Leonard Stokes again in the Lists.

THE most recent addition to the discussion relative to the new Government Offices now being erected in Whitehall is a further letter from Mr. Leonard Stokes to the "Times" correcting the inspired article by a "correspondent," which we published and commented on in our issue for September 11th. Mr. Stokes says:—

First, I fear your correspondent can hardly be any judge of architectural matters at all if he really thinks the Record Office in Chancery Lane "one of the most beautiful (buildings) in London"; far from being so, it is really one of the most childish productions of modern times externally and internally. If rooms 20ft. high constitute the perfection of comfort when provided for two or three clerks, then perhaps it may be "perfect for the purpose for which it was designed," as stated.

Your correspondent seems to think architecture is all "a matter of taste," but he is quite wrong, for there is good and bad in architecture, as in other things, quite apart from taste; and I repeat that the Record Offices are thoroughly and unmistakably bad, and this opinion I am prepared to back against your correspondent's, whoever he may be, and we can refer the matter to any qualified judge or judges he may like to name.

Your correspondent again shows his want of knowledge when he states that had Brydon lived the rest of his "commission" would have gone in remunerating subordinates. This is too absurd for anything. Had Brydon lived every single detail about the building would have been either drawn by his own hand or under his direction and supervision, and I venture to state that not more than about one-tenth of the remaining "commission" would have gone to subordinates, for he kept but a small staff, preferring to do his own work; and here we have just the difference between a public office, like the Office of Works, and a good private office. In the former subordinates do the work, as pointed out by your correspondent, while in the latter the principal does it himself.

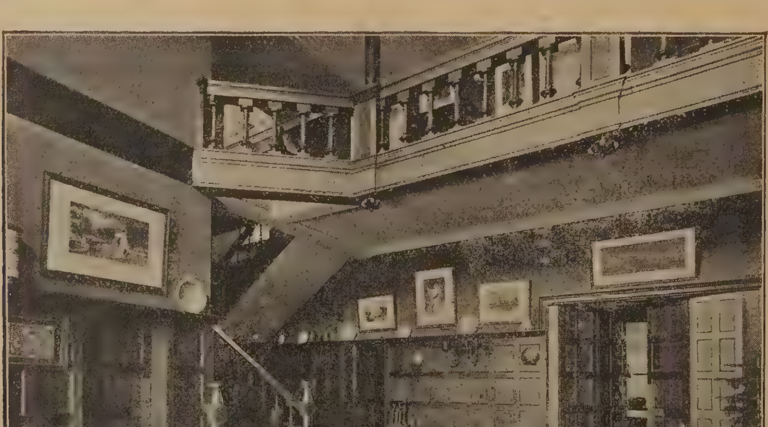
Street himself drew every single detail in the Law Courts, and the details are all good. The building as a whole perhaps may not be all it might have been, for this reason, that the Office of Works had control over Street. I have always been told that the Office of Works are responsible for the Courts being on the first floor (the one great mistake in the design), and I know that on Street's original drawings he had provided for heating and ventilating the building; he was, however, told by the Office of Works that they would see to such matters later on, and he was not to provide for anything of the kind; consequently when the building was almost finished it had to be fearfully cut about, at great expense, to introduce the Office of Works' "system of heating and ventilating." Those who use the building know the result and blame Street; and Brydon will get the "credit," your correspondent informs us, for the design of the new Government offices, after it has been detailed by a staff of subordinates similar to that which detailed the "beautiful" Record Offices!

A dead man's reputation and memory are dear to his friends, and as Brydon's friend and executor I decline to have any such "credit" laid at his door. The Office of Works cannot detail the building so that it will be any credit to Brydon's memory, any more than the officials of "South Kensington" could finish a portrait left, say, two-fifths completed by Rembrandt, for there is individuality in architecture as there is in painting, music, and every other art.

A good deal was at one time made of the fact that Brydon's head draughtsman had been engaged by the Office of Works to help to complete the building as Brydon would have finished it; this young gentleman is now working under a weekly engagement at the Office of Works, and is with others engaged in altering already Brydon's design, which your correspondent assures us it is the principal desire of the First Commissioner to see carried out as Brydon left it. Your correspondent however says nothing about this, and he also repudiates the saving of expense theory, and produces for the first time another, viz., that no really eminent outside architect could be found to finish Brydon's design, and that if an outside architect were employed, "it would have to be a man of the second or third rank in his profession." Here again I think your correspondent must be quite wrong, and I cannot believe any outside architects were ever approached at all. Even if they have been, and they could not see their way to sink their own individuality, as your correspondent says, I venture to state that it would be far better for the building, its owners, the public, as well as for Brydon's memory, to have it finished by an architect of even second or third rank than to let it fall into the hands of the subordinates named by your correspondent, none of whom, I fancy, are equal even to an outside architect of second or third rank.

When it was decided to build South Kensington Museum, the War Office buildings, and the new Government offices, the idea was to appoint an outside architect to each, with Sir John Taylor as architectural representative of the Government to keep an eye on them and to look after the "comfort of the occupants," as your correspondent puts it. Out of the three architects appointed, Mr. Aston Webb, A.R.A., is the only one left living, and he, with Sir John Taylor as above explained, is carrying out South Kensington Museum. Mr. William Young, who was appointed to do the War Office, died some months ago, and the Government appointed his son, Mr. Clyde Young (an outside architect), to complete his father's work in conjunction with Sir John Taylor. And now Brydon dies, and the Government for some unknown reason depart from their original idea (upon which they are still acting for the two other buildings) and propose that one Office of Works official, Mr. Henry Tanner, in conjunction with another, Sir John Taylor, should nominally complete the new Government offices in Parliament Street; but that subordinates should really do so!

The council of the Royal Institute of British Architects protested against this proposal without effect. Mr. Emerson, the president of the R.I.B.A., has also written to you on the subject, as well as Professor Aitchison, R.A., and your valuable aid has been further given in a leading article, and yet there is no sign of the Office of Works relenting, but instead your apparently inspired correspondent sends to you the communication you print, a communication, I venture to think, most unsatisfactory in every way, and particularly in those points I have ventured to call attention to.



THE HALL, HOUSE AT BURLEY-IN-WHARFEDALE.

School Extension at Southport.—An addition has been made to the Wennington Road schools of All Saints' parish, Southport. The building, designed by Mr. Jones, architect, of Southport, consists of a large schoolroom with three spacious class-rooms grouped in a compact and convenient manner, with separate exits, so that each can be cleared without disturbance to any other adjoining room. They may all be thrown into one for parochial purposes, and will then accommodate 800 persons.

NEW ISOLATION HOSPITAL AT FORFAR.

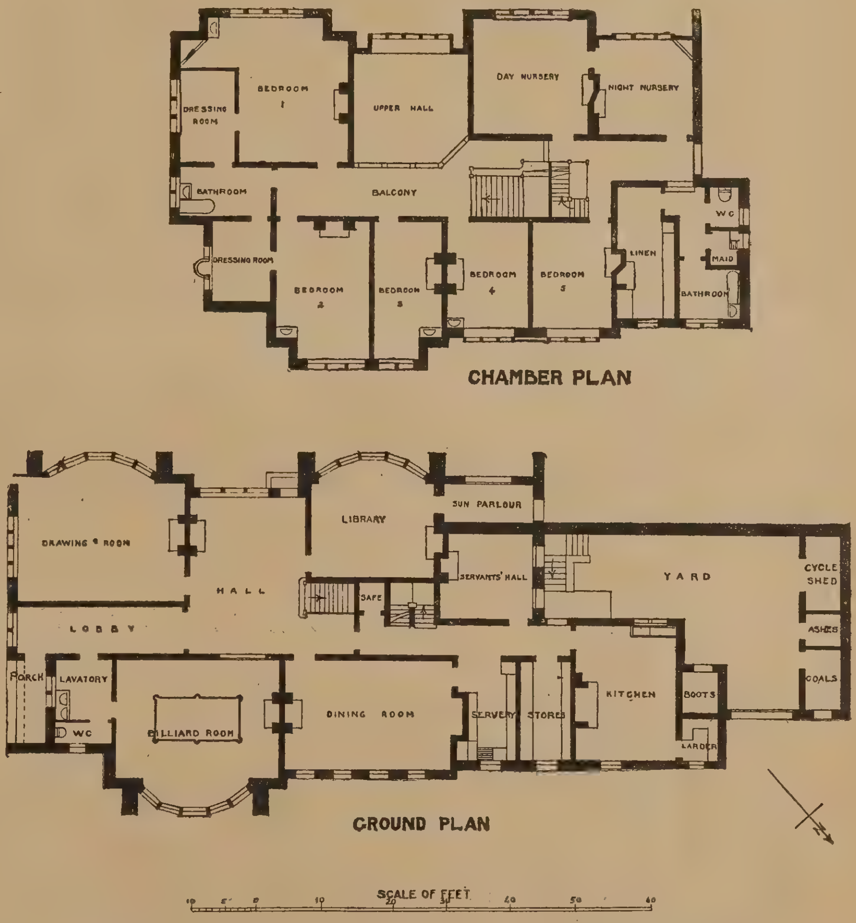
A NEW infectious diseases hospital has been built at Whitehills, Forfar, for the Dundee and Forfar Districts of the Forfar County Council. The buildings consist of a large administrative block, with matron's parlour and bedroom, doctor's room, nurses' dayroom, kitchen and stores on the ground floor, and four nurses' bedrooms, two servants' bedrooms, napery, two bathrooms on the first floor. On the east side of the administrative block is placed the isolation block, having two wards of one bed each, with nurses' room, bathroom, &c.; and to the west of the administrative block is the discharge block, with undressing and dressing rooms, bathroom and stores for patients' clothes. Along the high ground to the south-east of the administrative block is placed the scarlet-fever block, having two wards of eight beds each, and two wards of one bed each for acute cases. The nurses' rooms and pantries are placed between the wards while the baths are placed in annexes at the end of each ward, connected with the main buildings by through ventilated passages. South-west of the administrative block are placed the typhoid and diphtheria blocks, having two wards of two beds each, with nurses' rooms and other conveniences. The offices are placed at the south end of the ground, out of sight of the other wards, and consist of mortuary, ambulance sheds, toolhouse, wash-house and ironing-room, disinfector and boiler-house, coal stores, and other conveniences. The blocks have been placed on the highest ridges of the ground, about 60ft. apart, and the intervening ground made up to an even surface between. The main entrance is from the north, and a macadamised road runs through the grounds to to the south entrance, while carriage sweeps are formed opposite each block and connected with the road. Granolithic footpaths lead from the nurses' entrance in the administrative block to all the other blocks. Gas lamps are erected throughout the grounds for the convenience of the night service, and fire hydrants are placed in conspicuous positions opposite the various blocks. The drains are in straight lines, and provided with manways and inspection eyes at at any change of route or level. The grounds have been laid out with the view of preserving as nearly as possible the natural contour of the ground. The interiors have been fitted up with every modern convenience to ensure the comfort of patients and nurses. Telephones connect the various wards with the administrative block. The whole ground is enclosed by a substantial stone wall averaging 2ft. high. The contractors for the various works were as follows: Messrs. James Cargill & Co., builders, Forfar; Messrs. Alexander Hay & Co., joiners, Forfar; Messrs. William Brand & Sons, slaters, Arbroath; Mr. D. Brown, plumber, Dundee; Mr. D. Masterton, plasterer, Forfar; Mr. J. H. Douglas, glazier, Montrose; Messrs. Thomas Bradford & Co., laundry engineers, Manchester; Messrs. A. Westwood & Son, bells and telephones, Dundee; gas main—Messrs. William Mitchell & Son Dundee; water supply—Messrs. William Mitchell & Son, Dundee; drainage—Messrs. J. Gray & Sons, Newtyle; locks and furniture—Messrs. Eadie & Kininmouth, Forfar; painter work—Messrs. Doig & M'Phee, Forfar; boundary walls—Mr. James M'Lean, Forfar; laying out of grounds—Mr. P. Girrity, Dundee; ventilation—Messrs. R. Boyle & Sons, Ltd., Glasgow; grates—Messrs. G. H. Nicoll & Co., Dundee; gates—Mr. A. M'Call, Dundee; furniture and furnishings—Messrs. Thomas Justice & Sons, Ltd., Dundee. The clerk of works being the late Mr. D. Kidd, Mr. Drummond has acted as clerk of works since Mr. Kidd's death. The whole works have been carried out from plans and under the superintendence of the architect, Mr. T. Martin Cappon, F.R.I.B.A., 130, Reform Street, Dundee. This hospital is one of the most complete of its kind, and will compare favourably as regards cost per bed with any similar structure in Scotland. The Local Government Board, when passing the plans, made a very complimentary reference to the planning and arrangement of the building, which, from all accounts, appears to have been carried out in a very creditable manner.

GARDEN CITIES.

THE BIRMINGHAM CONFERENCE.

A CONFERENCE was held at Birmingham on Friday and Saturday last in connection with the Garden City Association. Mr. Ralph Neville, K.C., who presided, explained the objects of the conference, after which a discussion took place on the advantages which attend removal of works from large cities to new districts; how difficulties may be overcome, and the evils of overcrowding in large cities and depopulation of rural districts checked; and how local authorities and building and co-operative societies can best assist in such movements. The following resolution was carried:—

"That the Conference recognises the great evils which arise from bad housing conditions; urges local authorities (and particularly the Local Government Board) to put in force the Housing of the Working Classes Acts of 1890 and 1900, and borrow money for the purpose of acquiring land and erecting cheap and good houses for the people; and draws the attention of such authorities, and of building and co-operative societies, to the opportunity which presents itself to them to carry out housing schemes for the benefit of the workers when factories are about to be established in new districts."



HOUSE AT BURLEY-IN-WHARFEDALE. ADKIN AND HILL, ARCHITECTS.

A discussion then followed on the Garden City project. We have already devoted considerable space to this matter and fully explained the details of the scheme,* but for those readers who have not read these particulars we may say that the chief features are: (A) A concerted movement on the part of manufacturers, co-operators and others to new areas; (B) The increased value of the land to be vested in the community; (C) The areas to be carefully planned in accordance with the best known principles; (D) Plenty of open space to be set apart for all time, so that overcrowding may be avoided in the future.

The following resolution was adopted by the conference:—

"That the housing problem can be solved and the congestion in crowded centres relieved by a concerted movement of manufacturers, co-operators and others to new areas, arrangements being made for securing to the people the whole of the increased value which their presence will give to the sites, and the areas being carefully planned so as to make adequate provision for the individual and social needs of thy people, especially with a view to securing for all time the combined advantages of town and country life."

On Saturday a visit was paid to Bournville, whence Messrs. Cadbury have removed their works from Birmingham. A description of the buildings will be found on page 159 of our issue for April 3rd last. After the tour of inspection had been completed a conference was held, over which the Right Hon. Earl Grey presided. Papers by Mr. Ralph Neville, K.C., chairman of the council of the Garden City Association, on "Co-operation in Garden Cities"; by Mr. Ebenezer Howard on "Manufactures and Labour in Garden Cities"; by Dr. Winslow Hall, M.R.C.S., on "Public Health in Garden Cities"; by Mr. H. Clapham Lander, A.R.I.B.A., on "The Advantages of Co-operative Dwellings"; and by Mr. Raymond Unwin, M.S.A., on "The Building of Houses in the Garden City"—were discussed in detail.

The general tone of the remarks may be gathered from the leaderette which appears on page 101 of this issue.

Change of Address.—In consequence of the houses on the south side of Great College Street, Westminster, abutting on Abingdon Street, being scheduled under the London County Council Embankment Improvement Scheme, Mr. Arthur H. Ryan-Tenison, A.R.I.B.A., is removing his chambers to 12, Little College Street, Westminster, S.W., where he will be located on and after the 29th instant.

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* See our issues for August 30th, October 25th, November 1st, November 15th, November 22nd and December 6th, 1899, and January 3rd, 1900.

WHAT CONSTITUTES BEAUTY IN ARCHITECTURE.

BY BARRY PARKER.

MR. BARRY PARKER recently delivered a lecture (in two parts) at the Glasgow Exhibition before the International Association for the Advancement of Science, Arts and Education, under the main title of "Wherein Beauty and Architecture lies," and the sub-title of "Placing of Light and Shade, Detail, Masses and Ornament."

Mr. Parker said that he had been led to the choice of this subject by a feeling which had grown upon him more and more, year by year, that those interested in the development of the knowledge and perception of truth in art do, in their attempts to help one another, almost invariably miss what is perhaps most important. Anyone setting out to help others to a knowledge of architecture, whether it be to train students with a view to their practising it as a profession or with the aim of guiding others to some understanding of what they see, always approaches his subject from some point of view other than that of trying to show them some main principles or guiding instincts which have led to beautiful results in all styles and periods, and at all times, throughout the history of the art.

SEMI-DETACHED HOUSES AT HEATON, BRADFORD: SOUTH FRONT. ADKIN AND HILL, ARCHITECTS.

He teaches his pupils building construction; he teaches them architectural drawing; he teaches them any amount of the history of architecture, its development from style to style; or even some abstract mathematical system of proportions, to their infinite and irrevocable loss of ability for any broader grasp. He teaches them the art of planning economically and conveniently; perhaps even the adaptation of the architecture to the climatic conditions of a country, and the habits and mode of life of a race. He will probably go so far as to state that he feels this building to be beautiful and not that, but does he ever attempt to teach wherein lies the beauty of the one and the failure of the other?

Mr. Parker did not ask that the teacher should point out why the attainment of beauty lies in the recognition of this or that broad principle or æsthetic instinct; that would, he said, in most cases, be beyond what it would be fair to ask. But by a thoughtful comparison of many buildings belonging to all styles and all periods he could discover and point out right instincts, always followed, and factors always duly valued in successful work the world over—in fact, wherein the beauty of a building lies.

He went on to point out that this absence of any attempt to create a power to analyse into its constituent elements the beauty of one building, and to see what has led to the absence of beauty in another, was another characteristic of our art training to-day, which made for the increase of that army of copyists (incapable of the least originality) by which the progress of the art of architecture is so lamentably hindered. For he who has merely seen that one building is beautiful and another not, and has never approached either with any attempt to discover the qualities making for success or failure, will have no idea of doing anything more than reproducing what he has seen to be beautiful as slavishly as the new conditions in which he is placing it will admit. He will have no power to see that he commands the qualities which have made for success.

From his want of power to analyse the beauty of his model into its constituent elements he will be certain so to adapt it to its new conditions as to destroy that beauty. Mr. Parker showed on the screen photographs and sketches of many European buildings, pointing out how the disposition and placing of the main masses of light and shade must take precedence of all other questions if beauty, and not entire loss of dignity, is to result. He demonstrated the truth of this by showing various examples of buildings where there was no massing of light and shade; the light was all broken up, and the shade was all broken up and spread in little patches and strips universally over the whole building. He went on to show that to gain beauty it was necessary there should be not merely restraint in the use of detail, and a sense of fitness in the parts selected to be finely detailed, but the right perception of the way in which the detail should be concentrated or grouped. "No truly happy effect ever was or ever can be produced where small and great are disposed universally over the whole surface of a building, and where no thought is given to the enhancing of the light parts and details by opposing them to the massive, the broad and the simple, where all parts are equally enriched, whether greatly or slightly, with mouldings, ornament, colouring, or in any other way, as is the case with so many modern buildings in which all enrichment is spread, profusely or sparsely as funds allow, equally over the whole facade."

He deplored the loss of power to rightly value plain surfaces, and showed by means of the lantern how much of the beauty of the work of the past resulted from due appreciation of these.

By means of a sketch of a window in Florence he had recently made for this purpose, and a photograph of a pulpit in Milan, and another of the Duomo in Florence, he showed how rightly to meet the differences in ornament demanded by considerations of distance from the spectator; how only vulgarity resulted from simply magnifying ornament because it was to be seen from a distance, and only irritation in the beholder by so designing that it could not be properly seen; how a truly happy result could only be got by designing ornament which was to be seen from a distance, simple but refined in detail, avoiding above all things multiplicity of different forms, that it may be easily grasped from a distance and satisfactory on close inspection.

Not the least interesting part of these lectures was that treating of the province of design in bringing into harmony the works of nature to the works of man; the province of design in introducing growing forms among architectural forms, and architectural forms among those of wild nature; the due fusing of the one into the other, and the softening of the abrupt contrast by frankly acknowledged art.

Finally, among the main principles in design which Mr. Barry Parker laid down as forming as it were the framework, he laid great stress on the following: "Everything anyone is called upon to design has certain clearly defined requirements, purposes and conditions, and the form must be given it which will best enable it to fulfil these before any other considerations may be entered upon. It is doomed to certain artistic failure if, from mistaken notions of the dictates of æsthetics, it is given a form which will make it less able to perform its functions than would some other form; and the ability and inability of the designer is shown in the degree he makes it satisfactory to our æsthetic instincts, while at the same time he enables it to perform its functions asp erfectly as possible." He also emphasised that its form must at the same time be one which revealed and explained the construction: not one which attempted to conceal it. An illustrated volume of lectures by Mr. Barry Parker and Mr. Raymond Unwin will, we understand, be published by Messrs. Longmans, Green & Co. early next month.

IMPROVEMENTS IN THE HOUSE OF COMMONS.

THE Select Committee of the House of Commons which was appointed in March last to consider "whether any and what arrangements can be made to improve the accommodation provided for the general use of members of this House" have just made its report. The Committee recommend improvements intended to increase the comfort of the ladies listening to the debates as well as of the members themselves. The great smoking-room grievance is to be redressed. "It has been given in evidence and indeed it is a matter of common knowledge in the House," says the Committee "that the members' smoking-room on the main floor is always inconveniently crowded and very hot." It is hoped to lessen the heat by reducing the temperature of the kitchen underneath. The Committee recommends that the present members' smoking-room be used as the strangers' dining-room; that the present middle dining-room be reserved for members only; and that the third dining-room, next to the House of Lords, be used as a smoking-room. Three large rooms fronting the Terrace are to be reserved, two for smoking and one for reading. Hearing that "great inconvenience is caused to members for want of dining accommodation," there being room for only 140 diners while often 300 dinners have to be served, and members thus have to wait their turn at the tables, the Committee recommends two new dining-rooms on the Terrace front, to one of which ladies should be admitted. A ladies' retiring-room will also be provided. The "Times" reporters' room is to be added to the refreshment-room of the Ladies' Gallery, and the defective ventilation of the Ladies' Gallery is to be the subject of remedial experiments. The Committee thinks consideration should be given to the need for more dining space for the Press Gallery, and it recommends improvements of the accommodation for the telegraphic staff, for lady typists and members' secretaries, various alterations in the kitchen, and the opening of a refreshment bar for the messengers and subordinate staff of the House. The question of the inadequate ventilation of the Committee rooms is also dealt with. The report urges that this matter should be deal with without delay, so that the improvements may be completed before next Session. The total cost of the improvements is estimated at £30,000 and it is strongly urged that the recommendations embodied in the report be carried out as soon as possible.

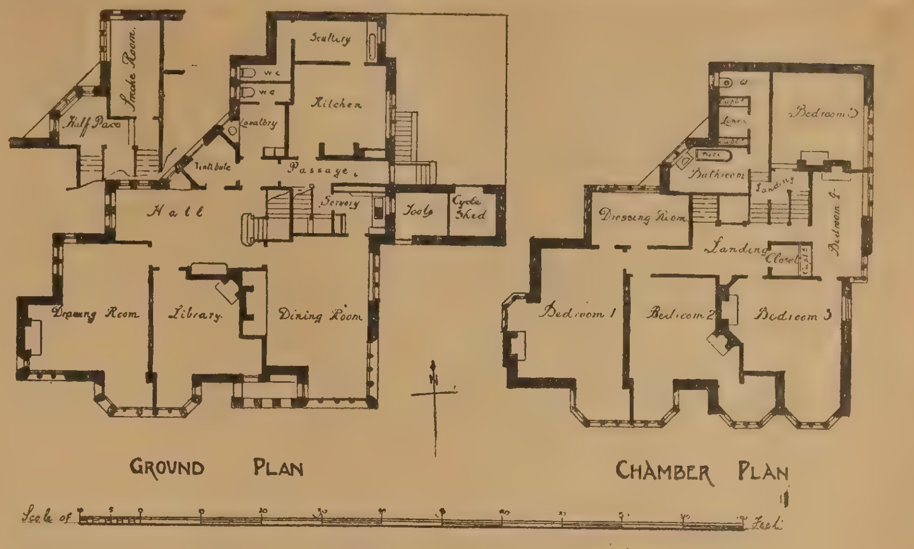
The Ellison Schools, Gateshead, have just been altered at a cost of £7000. The alterations have added several rooms to the building and provided a hall for large meetings. The place has also been furnished and the lighting and ventilation attended to.

THE BRITISH ASSOCIATION.

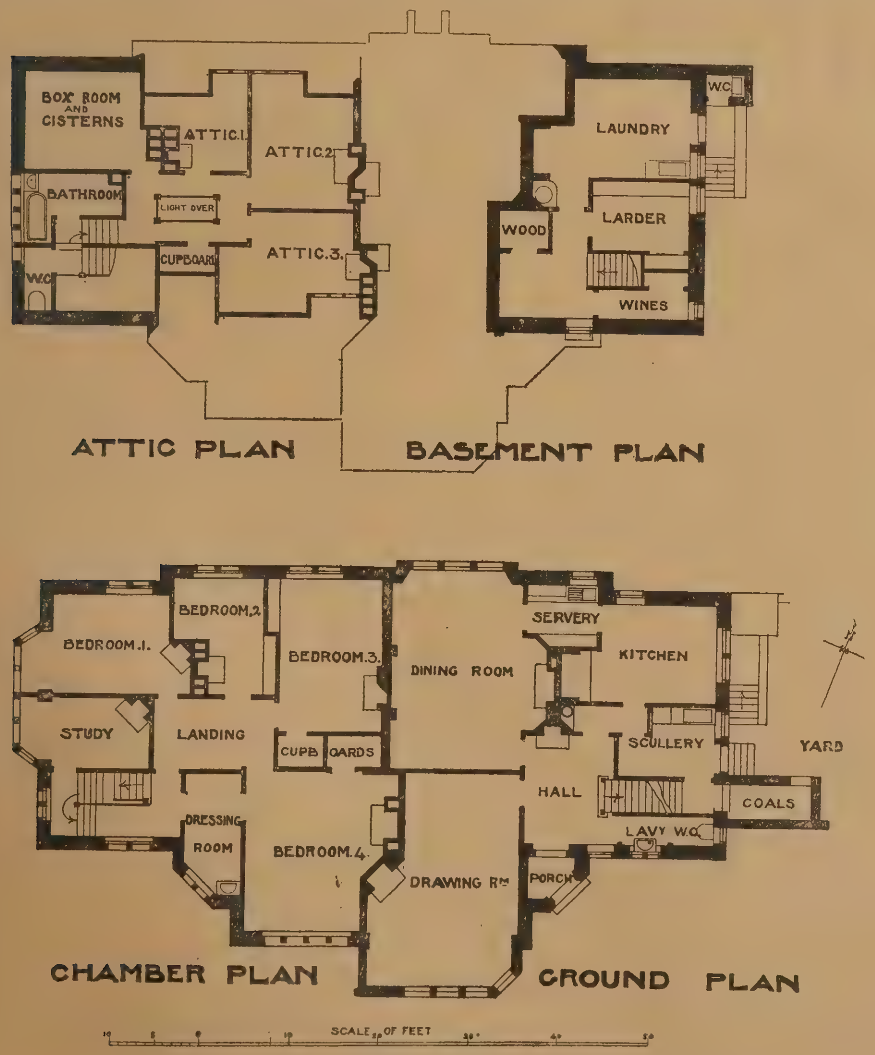
THE meeting of the British Association at Glasgow was concluded last week. On Monday, September 16th, in the Mechanical Science Section, Mr. Killingworth Hedges, M. Inst. C.E., read a paper on

The Protection of Buildings from Lightning.

He said the last time the subject was brought before the British Association was in 1888. Sir William Preece then opened the discussion by saying that is was a most remarkable thing that if one wanted to know much about atmospheric electricity one had to go back to the works of Benjamin Franklin, 140 years ago. Up to the year 1881 there was not even a code of rules in the United Kingdom to guide people in protecting their buildings from the destructive effects of atmospheric electricity. To the efforts of this Association they owed the first set of rules. The history of the art since then had been one of stagnation. Distinguished scientists, like Professor Oliver Lodge and Dr. Weber in Germany, had put forward their views from time to time, but still they saw conductors erected in a manner which could be shown both by laboratory experiments and by actual reference to lightning strokes to be a source of danger instead of acting as safeguards to the buildings; also, the misleading belief of an area of protection was the cause of the erection of an isolated rod, for instance, on a church tower, while the rest of the building had no conductor, or, what was more important, no metallic connection to earth. Interest in the subject had been again revived, first in Germany by the Electro-Technische Verein of Berlin, who, after much discussion, published on July 21st of this year a set of rules and recommendations on the protection of buildings; and in this country they had the Lightning Research Committee organised in January last. Setting aside the opinions of those who considered it was cheaper to insure than to spend money on protection, he pointed out that even architects dismissed the question by a short note at the end of their specifications —"Provide a proper lightning conductor," without a word as to where it was to be placed, and, what was more important, how it was to be connected to earth. Insurance offices, too, seemed to ignore the question of protection altogether, as no difference was made in the rate per cent. on a building scientifically protected, those on which there were, perhaps, one or two lightning rods, and other structures without any conductors at all. An insurance surveyor told him that he thought there was little to choose in the two latter risks if the conductors, as was too often the case, were allowed to get out of order; but to say that it was impossible so to protect a building, that the risk of lightning was not reduced to a minimum, was to confess that they in England were far behind Continental nations in the attention which had been paid to this subject. He then gave an account of his rearrangement of the system used at St. Paul's Cathedral, where the conductors, erected as recently as 1872, were found to be totally inefficient, both as regards the conductivity of the joints and the resistance of the earth connections. In the plan recommended, both for this installation and for the more recent one at Westminster Abbey, the number of ordinary conductors from air to earth had been greatly increased, and, besides these, horizontal cables were run on the ridges of the roofs and in other prominent positions so as to encircle the building, being interconnected to the vertical conductors wherever they cross one another. The horizontal cables were furnished at intervals with aigrettes, or spikes, which were invisible from the ground level, and were designed to give many points of discharge. At the same time they, in conjunction with the cables, would receive any side flash which might occur should any portion of the building receive a direct stroke of lightning. The unreliability of soldered joints for conductors, whether of cable or tape, had led him to design a special joint box, which could be applied for uniting any portion of the system together in such a manner as to give great mechanical strength as well as good electrical contact; at the same time any box could have points inserted so as to form an aigrette in any desired position. Owing to the difficulty of sinking an earth plate of sufficient area, on account of old foundations, a special form of tubular earth had been designed which took up little space and had the advantage that if a suitable moist ground was not obtainable the desired low electrical resistance was attained by leading a tube in connection with the rain-water pipes, so that a portion of the rainfall was diverted to the tubular earth. In isolated private houses it was well to run a small copper wire up each of the chimney stacks and connect all these conductors with a horizontal cable, which might, if the run was long enough, have short aigrettes. The earth conductors were led downwards from each side of the roof. If suitable arrangements could be made when a building was being erected, a modification of the American system of using gutters and water pipes as the conductors could be adopted, and would then add only a nominal cost to the fittings usually supplied. As to what should be done generally, he recommended that joints should be avoided when possible, and also sharp bends and roundabout paths to earth. A conductor detached from the building was safer than one in close contact with it, and it should be kept a short distance from the building by means of supports, which must not be insulated. If joints were necessary the stranded wires must be spliced and soldered and tapes must be riveted and soldered. Tee and other connections



RESIDENCE AT ILKLEY. ADKIN AND HILL, ARCHITECTS.



HOUSES AT HEATON, BRADFORD. ADKIN AND HILL, ARCHITECTS.

and the union of air terminals or aigrettes to the cable should be made by splicing or careful binding and then protecting the joint by a metal box which was to be filled with hard solder. All flagstaffs should be protected by a conductor projecting a few inches above the top. If the pole was on a metallic roof, this should also be connected to earth. A building once struck was liable to be again damaged, and special care should be taken in protecting it. Our cathedrals and museums were of national importance, and if it was found necessary on the Continent to have a thorough system of protection and frequent inspection surely it should be done here, as the initial expense could be spread over a number of years, and the annual upkeep would be sufficiently provided for by a one per cent. rate on the sum spent for structural repairs. The Lightning Research Committee were collecting facts by means of the assistance of observers throughout the country who were qualified by position and training, and when a sufficient number of observations were recorded it was thought that the science of the matter would be much more advanced than by trying to theorise too much on the imperfect knowledge and facts which they possessed at present.

Mr. Hedges, in reply to criticisms, said he had recommended keeping away the conductor from the building because that was the plan generally adopted on the Continent, where lightning storms were much more frequent than here. He agreed that architects might get puzzled if one thing was recommended and then another, and he should prefer not to put down any rules as absolutely definite until they had more results from the observers dotted all over the country in connection with the Research Committee.

Bridges in China.

Mr. R. Lockhart Jack described a number of bridges in the provinces of Szechuan and Yunnan in Western China. There was, he said, reason to believe that the form of the bridges found in these provinces was evolved locally, although much of the decoration was distinctly of Indian origin, and was no doubt introduced with the Buddhist faith. The Chinese had learned to use their materials with considerable skill, and a thorough investigation of their handicraft possibly would reveal whether they had developed a formula for their guidance or whether by long experience their bridge builders had learned to turn out good work by empirical methods. The subject as a field for scientific investigation was untouched, and would certainly yield results of great interest when compared with mediæval and modern work in Europe.

On Tuesday, September 19th, the President, Colonel R. E Crompton, M.Inst.C.E., intimated that in response to an invitation several members had made an inspection of

The Glasgow Harbour Tunnel,

and had been much interested. Sir Frederick Bramwell said he had had the pleasure of going over the works. As compared with the long approaches of, say, the Blackwall Tunnel, this mode of dealing with traffic was most satisfactory and he believed it would be much cheaper in the end. He only wished the London County Council would thoroughly investigate the matter. Professor Barr said the nominal financial success of the scheme ought not to be judged as an objection. Until a few years ago there was very great difficulty in crossing the Clyde at this section, but a horse ferry had now been provided, and had taken up a great deal of the horse traffic, while the Glasgow District Subway carried the great bulk of the passenger traffic. These local circumstances accounted for the fact that the scheme was only a partial financial success, and he was convinced that at other places and in other circumstances this method of dealing with traffic would prove entirely successful from a financial point of view.

Mr. J. W. Thomas, F.I.C., F.C.S., spoke of alternating air currents and down-draughts in churches and public buildings. He pointed out that down-draughts were not continuous in high buildings, but that the cold air falling from the top of a high building compressed the layer of air beneath, and, owing to the elastic properties of air, it remained stationary near the floor of the building for some seconds and afterwards an up-current was formed, the result being that alternating air currents were produced at intervals of about half a minute. The pressure of the outer air when falling down a building at freezing point caused the pressure of the air inside the building to be increased greatly, whilst during the up-current the pressure was reduced to its lowest limit. Alternating air currents upset the ventilation of high buildings with too much top exit space, and caused the products of respiration to be breathed over again.

This closed the proceedings of the section.

On Tuesday in the Botany section, Mr. Samuel Margerison read a paper on

The Transport of British Timber.

He said that in this country it costs about 5d. to grow a cu. ft. of fir timber. On the average it cost about another 5d. or 6d. to get it into the market, and it sold for 8d. to 9d. per cu. ft. The chief reason why it sold for less than cost price was that foreign fir was sold at the figure specified and the growers and importers could make it pay. He had selected fir as an extreme case in order to emphasise the fact that the handling charges on home-grown timber were much higher than those on imported timber of the same species. We could grow Scots fir and spruce practically as cheaply as the Continental forester, but we could not afford to sell it at the same price, and at the same time compete on equal terms with him, because it cost us more to transport it from the plantation to the consumer, sometimes even when both were in the same county. Preferential railway rates in this country were costing timber growers nearly as much as the rental value of the land on which the timber was growing. Why was there this great check upon the efforts to make "forestry pay?" One reason was that foreign timber imports were handled generally in larger quantities so that detail work was done more cheaply. But it was not only in railway charges that our expenses were higher. The over-land carriage cost us more. We had not the advantage of water-shoots and great rivers, or sufficient snows and frosts to make water or ice a generally available means of transport. Could these overland forest to railway handling charges be reduced? He had made some inquiry about tramway and other mechanical appliances but did not see any advantage to be gained from them under the conditions ruling in this country. The chief drawback to their use was that our small and scattered plantations would not pay for the profitable employment of costly plant and machinery for transport. A tramway, cheap as it was in working, was costly in instalment and would, in a large number of cases, be much dearer than the present system of removal by horse waggons. Besides, public roads would have to be used and crossed, and county councils would not be ready to allow this. Under favourable circumstances, again, traction engines would effect considerable economy in haulage. A load of 12 or 15 tons might on some roads be carried for less than one of 3 or 4 tons drawn by horses. But good roads did not often penetrate into the woods, and there were weak bridges and sharp corners to contend with, which would not be negotiable with long heavy loads such as would be required to use the full available power. The pole-waggon at present in use, drawn by horses, was the best appliance at present in existence for collecting timber from our comparatively small timber areas in the first instance. But if we could have partial conversion of the timber at centres close to large areas of timber, we could considerably cheapen the cost of transport, both by using traction engines and tramway for the local work, and traction engines for "through" traffic to reasonable distances. There was no gainsaying the fact that native timber did, on the whole, cost somewhat more to transport than foreign. It was often in clumsy, dangerous forms, crooked and knotty, whilst imported timber was generally wholly or partly converted into tidy, straight pieces, making more compact and firmer loads. And, being dealt with at ports in larger quantities at one place, much of the work was centralised and specialised, with the result that there was a large saving in details. Whilst persevering in the efforts which had been made of late years to improve our forestry, it behoved growers to pay special attention in future to the relation of transport to concentration of production, the producing of timbers on the higher values, compactness of loads and regularity of supply of consignments.

Correspondence.

Domestic Architecture.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Have you observed the coming revolution in domestic architecture as set forth in the "Daily Mail"? Have you noticed the "new construction" in our £10,000 article, where arches appear without abutments and stone gables rest on glass? One assumes a chapter "on the constructional use of window panes." You will observe all our goods are marked with plain figures. Our cottage style with ingle and seat we can do you for £200. Our "Swiss Chalet" style, which has had a great run, comes a *leetle* more expensive. It is marked, you will see, £500, subject of course to the usual discount. No, we do not include the cut hedge with arch. Something a little larger? Here is a very superior article indeed at £10,000, in which we have introduced the "New Construction." No, it is not imported from America; it is of home manufacture. I assure you, madam, all the work of our Mr. De Parcy Sharper. But, excuse me, did you not tell me just now that Mr. De Sharper was an architect? Quite so, madam. But I thought architects were not supposed to advertise? Ah, madam, that was before the revolution in domestic architecture. We have changed all that now!—Yours truly,

M. H. BAILLIE SCOTT.

A NEW CHURCH AT DUNDEE.

A NEW episcopal church at Strathmartine, Dundee, is being erected in Baldovan Road. It will accommodate 200 persons, and will be built of rough cast local stone with stone coigns and dressings. The length will be 104ft., the greatest breadth 25ft., and the average height up to the ridge 30ft. The general style is Late Decorated, with square-headed, traceried windows along each side, and somewhat elaborate traceried windows east and west. The design has been kept extremely simple, the only ornament on the outside being the tops of the buttresses which divide the chancel. It is to be roofed with the old-fashioned characteristically Scotch stone slate. The ceiling is to be curved or barrel-shaped, and the roof of the chancel will also be curved, but divided into panels with bosses at the intersection of the ribs. The chancel will be floored with chequered red and white stone, and the walls plastered. The cost of the building will be about £2,000. The architects are Messrs. Freeman & Ogilvy, Staple Inn, London, and the contractors as follows: Masons—Messrs. John Gray & Son, Newtyle; joiners and carpenters—Messrs. A. Bruce & Son, Clepington Road, Dundee; plumbers—Messrs. James Fyffe & Son, Nethergate, Dundee.

King Alfred an Architect.—A chaplet has been hung on the wall of the Free Reference Library, Manchester, below the statue of King Alfred. The chaplet has been sent by the Manchester Society of Architects, and the "raison d'etre" was thus explained by Mr. A. Darbyshire, the President of the Society: "It is not generally known, perhaps, that King Alfred was an architect. William of Malmsbury, in his 'Chronicles,' speaks of him as 'not only a lawyer, ruler, mathematician and poet, but also a complete architect.' Of course we know that he rebuilt London, and also really built the towns of Winchester and Dorchester. He was, in fact, a real architect as well as a great many other things. It struck me, as President of the Manchester Society of Architects, that it would be a nice thing to honour his memory, and the Society has sent the chaplet, which is made of laurels to indicate his victorious character, and white flowers to indicate his high morality. The Society decided that the chaplet should be accompanied by the statement that it was from the President of the Manchester Society of Architects as a token of high respect for the memory of the great monarch, who was the pioneer of English architecture."

New Patents.

These patents are open to opposition until October 28th.

1901.—Ceiling Supports.—11,423. J. Erath, 24, Molsheimerstrasse, Strassburg, Germany. Holders of H-section with a serrated spike are driven into the beams and between them plaster slabs are fixed. Sound is thus deadened, the plaster does not crack, and there is an air-space above the ceiling.

Artificial Wood.—13,136. E. Helbing, 5, Schillerstrasse, Wandsbek, Hamburg. Peat is thoroughly washed and is mixed with hydrate of lime and sulphate of alumina. The mass is pressed in a wet condition and dries hard in the open air.

Parquet Floor Blocks.—13,818. E. Wuhrmann, 18, Kinklestrasse, Zurich, Switzerland. This invention relates to a machine which nails the floor blocks together into squares; thus, three blocks are nailed together side by side and another three are nailed to them. The machine has synchronously-working hammers in front of which are holders for the nails, while the blocks are fed down an incline.

The following specifications were published on Saturday last, and are open to opposition until November 4th. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1900.—15,781, Defries & Feeny, sewage waggons. 16,780, Howell, high-pressure accumulator for incandescent gas lighting. 16,962, Moffatt, automatic doors for closing the entrances to lifts. 16,978, Tenow & Flodström, apparatus for the conveying and piling of timber. 17,058, Bell (*Gay & Argue*), chimneys and stove pipes. 17,129, Margetts, hinge joints. 17,428, Armstong, beams or girders. 18,183, Disselkoen, means for cutting glass. 18,232, Davey, domestic and other water-heating apparatus. 18,360, Evans (*Sarpy*), scaffolding. 18,374, Wise (*Salubratapeten Fabrik Basel*), wall coverings. 19,420, Cooke, water-closets. 19,816, Rutty & Bowden, road scarifiers. 20,067, Balmforth & Brown, manhole and handhole doors. 20,130, Clemetson, parquetry. 20,369, de Thiersant & Coulson, acetylene gas generators. 21,123, Flood, channels for sink waste. 21,402, Coveney, Venetian blinds. 21,412, Lane, screws for handrailing.

1901.—6608, Storer, mortising machines. 7,242, Ramage, oils for paints and varnishes. 7,388, Hahn & Lenz, deodorizing and clarifying sewage and effluents from breweries and technical establishments. 9,557, Brucksch, safety apparatus for lifts. 11,715, Lorenc, masonry work. 11,898, Brookes (*Fiske*), brick kilns. 12,073, Sborowitz, imitation marble. 12,626, Joseph K. Sierer, tile floors, walls, &c. 13,696, Lipffert, smoke-consuming furnaces and fire-places. 14,100 & 14,183, Taylor, gas producers. 14,217, Hosking, fanlights, windows, &c. 14,498, Newton (*New Jersey Wire Cloth Co.*), centering supports and fireproof constructions. 14,942, Richards, wall-tie or bond. 15,074, Brooks, windows. 15,121, Barbour, hoisting apparatus. 15,316, Allison (*Lawrence & McConick*), preserving wood. 15,423, Hibbard, safe or vault hinges and door-opening apparatus. 15,432, Hovver & Mason, excavating apparatus.

DRAWN BY E. STANLEY MITTON

Keystones.

A Granite Cross 60ft. high has been erected on the summit of Monte Capreo, near Carpineto, the birthplace of Pope Leo XIII.

A New Presbyterian Church at Wepre is being erected from designs by Mr. A. W. Smith, architect, of Manchester, at cost of £3,200, inclusive of land. It will accommodate 414 persons.

Mr. James Basford, a Leicester architect, while engaged last week inspecting the erection of the new Trinity Hospital for old people, missed his footing and fell head foremost through some girders, sustaining terrible injuries to his head and spine. Assistance was promptly rendered but he died in an hour without regaining consciousness.

A New Theatre at Glasgow is proposed to be erected. The site said to be selected is at the south-west corner of Elmbank Street and Bath Street, at present used as a yard for the storage of building material. The position is an admirable one, being only a few yards off Sauchiehall Street, near Charing Cross. It is stated that the theatre is to be ready for occupation about the autumn of next year, and that the cost will be between £30,000 and £40,000.

King Humbert's Coat of Mail.—Queen Margaret is to preserve in a strong box the vest which King Humbert was wearing at the time of his assassination. This box is of the Renaissance style, made of ebony, with designs in bas-reliefs and in chiselled silver. The front is decorated with the arms of Savoy; on the top is the cross of Savoy encircled with a garland of flowers, while on the other parts of the box are various inscriptions.

The Owen Jones Prizes.—The Society of Arts announces that the next award of the Owen Jones prizes will be made in 1902. These are for "students of the School of Art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damasks, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes, six in number, consist of the society's bronze medal and a copy of Owen Jones's "Principles of Design." Further particulars can be had upon application to the secretary at the rooms in John Street.

The Shoreditch Town Hall is being extended. The existing building is in Old Street, E.C., and has a dignified frontage with a tower of fine proportions, and it has been found possible to utilise the present hall with good effect. The London County Council possessed next door a fire station, which they have had to quit because of insufficient accommodation, and the Shoreditch Borough Council bought the site on advantageous terms. Mr. William G. Hunt, the architect, has designed an extension in strict accord with the hall as it now is. The hall is used for many purposes besides mere municipal business, and these will be served when the additions are completed in a fashion hitherto impossible. The cost will amount to over £20,000. The site has been obtained at a price of only 22s. 6d. per ft., while land round about had been sold at 30s. per ft.

An Addition to Trafalgar Square.—The Canadian Pacific Railway Company have decided to remove their offices from King William Street to a more central situation further west. They have purchased the freehold of a large block of land on the south side of Trafalgar Square, facing the National Gallery across the square. This block is now occupied by three-storey buildings, of which the street frontage is used as shops. The new premises are to be ready for occupation by January 1st, 1903. The new structure will add an imposing feature to Trafalgar Square, in keeping with the premises of the Union Bank of London and the Sun Life Office, which will flank it on either side. A feature of the building is in the top storey, the windows of which are so arranged that at nights a panorama of Canadian views can be exhibited, visible from every part of Trafalgar Square, and on important occasions special Canadian news as cabled from Montreal may be displayed in the same way.

A New Parish Church at Skirkieran, Bira, King's Co., Ireland is being erected.

Bartholdi the sculptor is an Alsatian, and several of his best works have been erected in his native province. His latest achievement is a huge figure of an Alsatian Cooper holding a glass in one hand and a bottle of Rhine wine in the other. The *tonnelier* will be placed on the top of the Wine Exchange at Colmar, in Alsace.

M. Uphues, the Berlin sculptor who executed the bust of the late Emperor Frederic which now stands in the park at Homburg, has been commissioned to produce a corresponding portrait in marble of the late Empress. This—the first monument to her Majesty's memory—will, when finished, be erected face to face with the bust of the late Emperor.

A New Public Library at Grangetown, Cardiff, has been opened. The cost of the buildings and freehold site was £3,501. The library is situated on the junction of Clive Street and Redlaver Street. The architect was Mr. E. M. Bruce-Vaughan, whose design won an open competition. The building is of red bricks with stone facings. It is well-lighted and ventilated. The contractors were Messrs. D. Thomas & Son, and Mr. Tom Taylor was clerk of the works.

A New Board School at Darlington is being erected on the left side of Hammer Street, going from Whessoe Lane. This will replace the Jane Street school and the old school near the Rolling Mills. The premises will be plain. Accommodation is to be provided for 420 scholars in the mixed departments and 270 in the infant school. The schools will cost about £8,500, apart from the price of the land. Mr. G. G. Hoskins is the architect, and Mr. H. St. P. Armstrong clerk of works. Messrs. John Guthrie & Son are the contractors for the brickwork; Messrs. T. Stairmand & Son for the woodwork.

The Memorial to the Late General Sir William Penn-Symons at Saltash was unveiled last week. It is from the design of Mr. A. S. Parker, of Plymouth. Mr. Bolt, of the Merrivale and Gunnislake quarries, undertook the erection, but he died before the work had far proceeded. His sons agreed to carry on the task and commissioned Messrs. Wakeham, of Plymouth, to complete it. The monument, which embraces a shaft arising out of a substantial plinth and capped by a carved crown, heavily gilded with English gilt, stands about 30ft. high. At the base is a bronze medallion (on the obverse side) with a life-sized bust of the late general, designed by Mr. A. Drury, A.R.A., and cast by Messrs. Singer, of Frome. The last-named firm have also made a bronze tablet, which will be placed beneath the medallion, bearing an inscription. The memorial has been erected in the centre of the Victoria Gardens.

Liverpool Cathedral: The St. James's Mount Site Adopted.—The executive committee who have in hand the carrying-out of the project to build a cathedral at Liverpool have adopted the St. James's Mount site and negotiations will be entered into with the corporation for the acquisition of the necessary land. In his report on this site Mr. George Bradbury, surveyor to the diocese, says: "On looking through the designs submitted in the Liverpool Cathedral Competition in 1885 I find that a basement storey is indicated below the level of the nave and chancel; this has a height of about 20ft. If we assume that a similar plan is adopted and the level of the nave floor of the new cathedral is placed upon the present level of St. James's Mount, then I have little doubt that the original rock will be found at about the level of St. James's Road, in some places about 10ft. above that level; and therefore some rock would have to be excavated to make such a basement. If it is decided not to construct a basement storey then I think the rock will be found, on an average, at about 12ft. below St. James's Mount, or an average of about 8ft. above St. James's Road. If any of the cathedral walls approach close to the cemetery wall, then in some places foundation might have to be carried down a depth of 40ft. from St. James's Mount. There is ample space on the northern portion of the Mount for the erection of the proposed cathedral. The foundations will present no exceptional difficulties, and their cost will compare favourably with other suggested sites."

A Memorial Window to the late Captain C. J. K. Maguire, of the Royal Sussex Regiment, has been placed in Bangor Parish Church.

Falguière, the distinguished sculptor, left unfinished several important works, among them being statues of Balzac and Pasteur. Under the direction of Paul Dubois, of the Beaux-Arts, the statues are being completed, and will be placed, Pasteur in the Square Cluny and Balzac in front of the Conseil d'Etat.

The Ancient Parish Church at Wingrave, Buckinghamshire, has been thoroughly restored at an expenditure of nearly £6,000. The tower has been restored at the base and the structure has been raised by 5yds. to provide for an adequate ringing chamber and a clock chamber, and an entirely new turret has been built.

A Memorial to the late Lord Caledon has been unveiled in the parish church at Caledon. The memorial, which is a beautiful piece of carving in stone, extends right across the entire base of the chancel window and is supported at either end by a single Corinthian column of marble and by two triple columns of marble in the centre.

Lewisham High Road Congregational Church, New Cross, London, S.E., has been renovated and decorated throughout, and the electric light installed. The stonework of the spire has been re-pointed in cement, and treated with a solution of "Fluate," and a new lightning conductor fixed by Messrs. E. Beresford & Co., Ludgate Circus, E.C. The repairs and decoration have been carried out by Messrs. J. O. Collingwood & Co., Brockley, S.E. The electric light was installed by Messrs. Braby & Tomlinson, 18, Hart Street, Bloomsbury. The electric fittings were made by Messrs. Evered & Co., of Drury Lane, W.C. The whole have been carried out from the designs and under the superintendence of Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, architects, of 5, Clements Inn, Strand, W.C., at a total cost of about £1,300.

Amesbury Church, well-known to visitors to Salisbury and Stonehenge, is proposed to be restored. The building is of ancient date, and portions of it are thought to have belonged to the Abbey Church, built in the twelfth century, on the site of the Benedictine convent founded by Queen Elfrida in the tenth century. Much havoc was wrought by an unfortunate "restoration" in 1852, but the present work is one of renovation and repair, mainly intended to save the old Norman central tower from destruction. The tower is supported on four wide lofty pointed arches, and now shows fractures of a dangerous character. Experts say that the four angles of the tower have become separated, while the voussoirs of the arch are nipped, the fractures being caused partly by inadequate foundation for the weight of the tower. It is necessary that measures should be taken by underpinning and other measures which would in nowise affect the appearance of the sacred edifice. Other matters requiring attention are the bulging choir walls and the dampness of the nave walls. It is estimated that £1,400 will be needed for these structural repairs.

New Central Co-operative Stores at Normanton, are being erected in Westgate for the Wakefield Industrial Society, Ltd., from the competitive designs of Mr. A. Hart, of Wakefield. They will cost, exclusive of furnishing, from £23,000 to £24,000. On the first floor there will be a suite of business offices and a strong room, rooms for recreation, committee meetings and the meetings of the Women's Guild; while on the second floor there is to be an assembly and concert hall, 100ft. long by about 50ft. wide, with a platform at one end and a gallery at the other. There will also be a smaller hall about 40ft. square which will be useful for smaller meetings, and each will be amply provided with ante-rooms, cloak-rooms, &c. The style of architecture is an adaptation of Flemish and Gothic. The principal contractors are Messrs. Clegg & Son, Morley, brick and stone work; Messrs. Pickles Bros., Leeds, slating; Mr. Marsden, Knottingley, plastering; Mr. J. Loyd, Wakefield, carpentry and joinery; Mr. George Blakey, Wakefield the shop fronts; Messrs. Bagshaw & Sons, Batley, iron and steel work; Mr. S. Atkinson, Wakefield, plumbing and glazing; and Mr. G. Parker, Wakefield, painting.

Mr. Glendinning Moxham, architect to the Swansea General and Eye Hospital, has received instructions to prepare plans for a convalescent home to be erected at Swansea.

Crematorium for London.—A site for another crematorium for London has been secured at Golder's Green, Hendon, adjacent to the terminus of the proposed tube railway from Charing Cross to Hampstead. Extensive excavations and building operations have already commenced.

New Fish-Curing Works at Dundee are being erected at Carolina Port, in the immediate vicinity of the Fish Dock. The plans of the buildings have been prepared by Mr. William Alexander, city architect. The buildings will be two storeys in height. The contractors for the work are: Brickwork, Mr. John Carnegie; joiner work, Messrs. Garvie & Farquharson; slater work, Mr. David Hutchison; plumber work, Mr. Colin White; concrete work, John Adam & Son.

A New Manchester Hospital.—A Local Government Board enquiry was held recently at Manchester into an application of the Lancashire County Council, to borrow £16,000 to erect an infectious disease hospital at Fall Birch, Chorley New Road, Horwich, for the Urban Districts of Blackrod, Horwich and West Houghton. Accommodation will be provided for forty beds and administrative block, the cost being £400 per bed. There was no opposition.

An American Hotel for London.—London is to have a new hotel built and managed on the most approved American principles and financed by an American syndicate. In order that a suitable site may be provided for it the Walsingham House and the Bath Hotels in Piccadilly are to be demolished forthwith, and the new building is expected to be ready in less than two years. It is to be built of stone and will rise to the height of eight storeys containing 350 rooms. The restaurant attached to it will run the whole length of the building on the park side and be fronted by a private garden.

A Baptist Church is to be erected at once in Lewin Road, S.W., and the tender of Messrs. W. Johnson & Co., Wandsworth, has just been accepted for the work at £3,033. A bold, square tower and spire above forms a prominent feature of the design and front elevation. The building is faced with red bricks and the dressings are of white Costessey stone. The roof is to be covered with green slates. The architects whose design was selected in a competition held some years ago, are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clements Inn, Strand, W.C.

How to Preserve Tapestries.—M. Jules Guiffrey, administrator of the Gobelins Factory, gives the following valuable particulars as to the means of preserving tapestries. They must not be fixed to the wall with nails, but suspended by rings sewn in the upper part. They should be isolated from the wall by a wood frame, and should never be left shut up in a drawer or closet without being protected by vermifuge. They must be beaten, brushed and exposed to the sun now and again, and must be rolled, not folded. If it is necessary to wash them thoroughly they should be plunged in running water for twenty-four hours and rubbed lightly with soap. This means of cleaning tapestry must not be overdone, as the colours, though they have wonderful resisting power, might be damaged.

Technical Classes in Camberwell.—The Technical and Art Classes held at the Greencoat School, Camberwell Green, S.E., resumed work for the winter session last Monday. These classes, in affiliation with the Technical Education Board of the L.C.C., the City and Guilds Institute and the Board of Education, have for many years done good work among the artizan population of Camberwell. Of late their usefulness has been considerably increased by the help of the Technical Education Board's grants in aid of equipment. By this means a very valuable collection of models and apparatus has been provided for the use of students employed in the building trade. In the past session six of the students were awarded exhibitions in science and technology as a result of a competitive examinative held in April last by the Technical Education Board of the London County Council.

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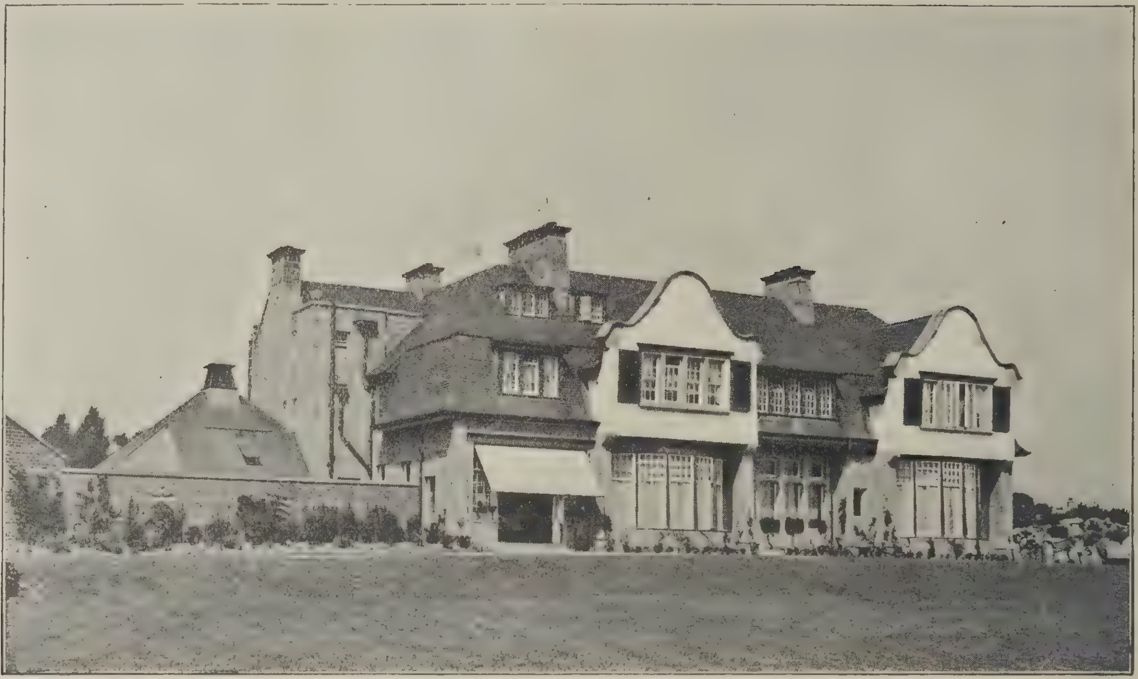
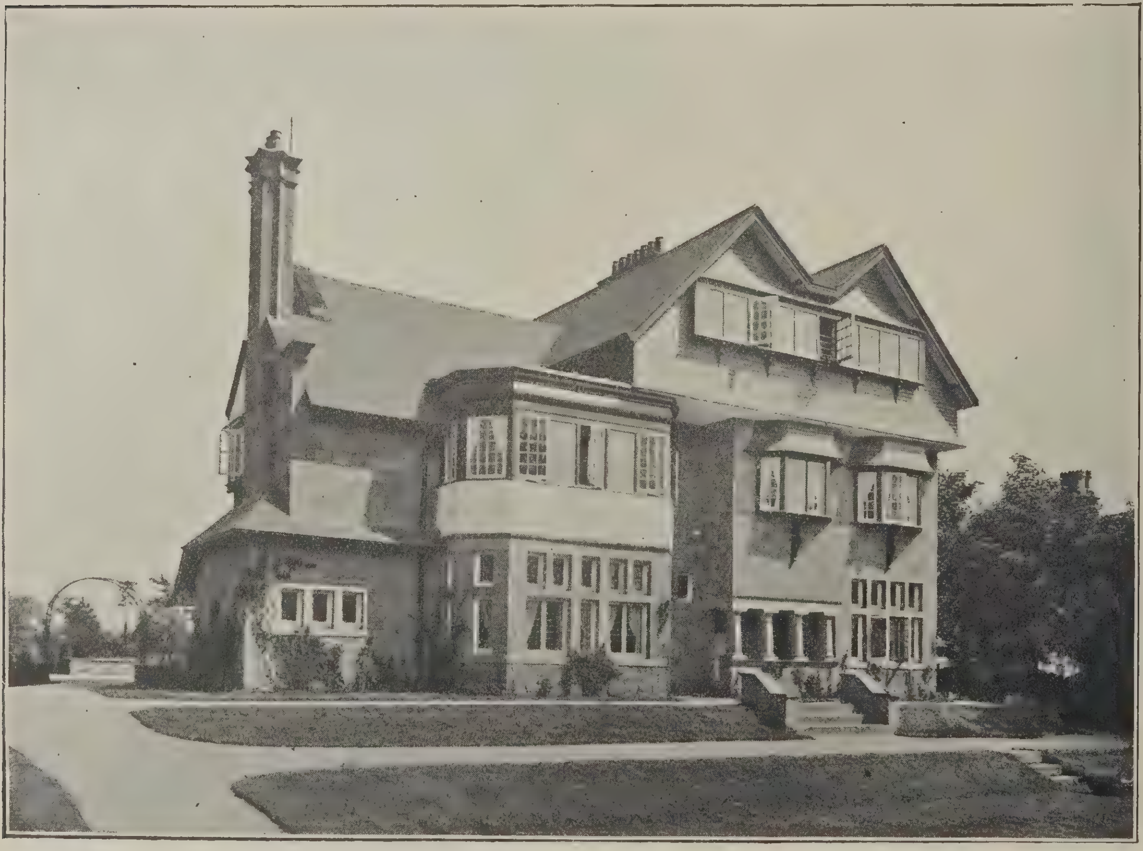
Wednesday, September 25th, 1901.



House at Burley-in-Wharfedale : Garden Front.



House at Ilkley : Garden Front.
Adkin and Hill, Architects.

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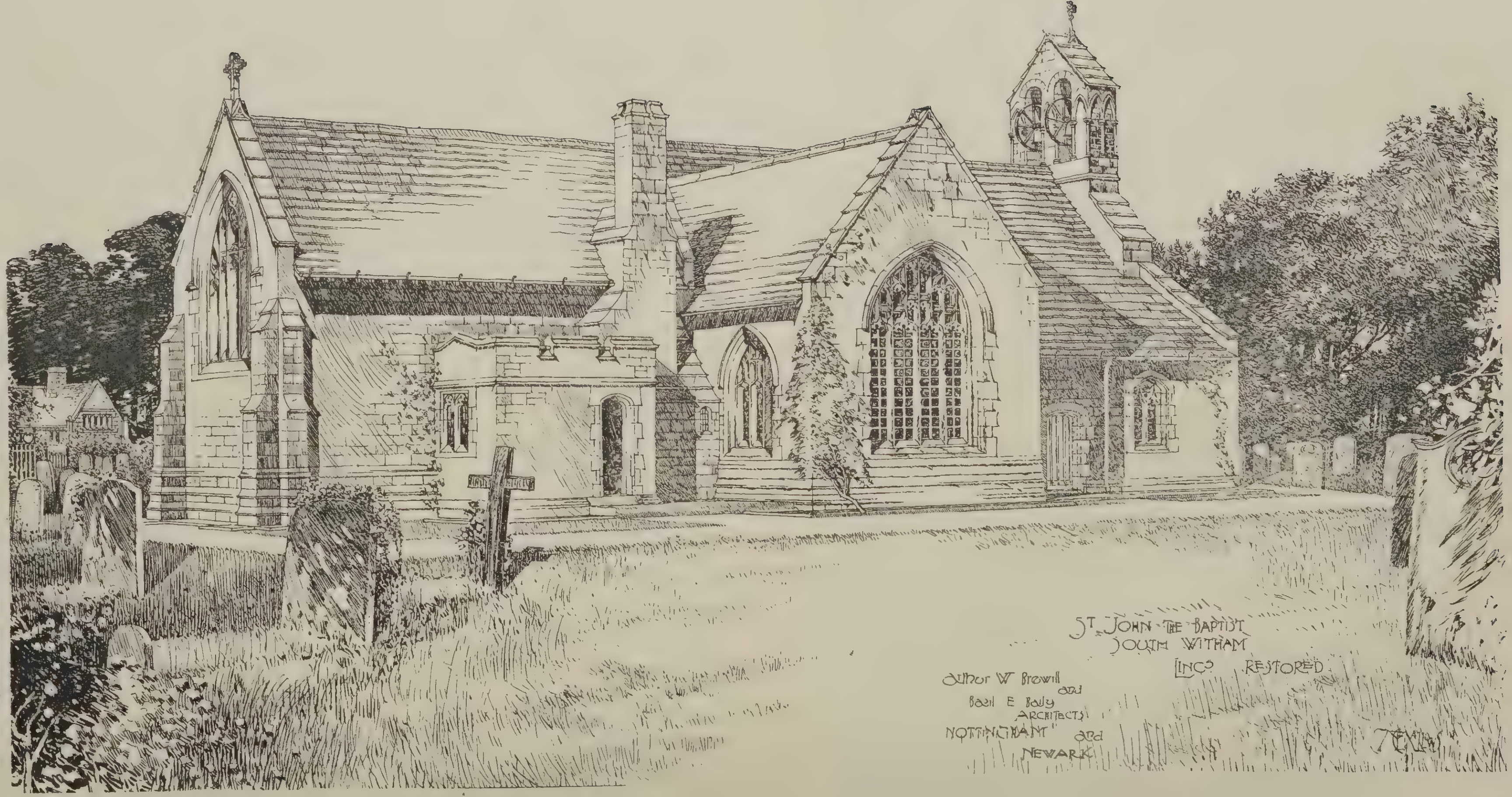

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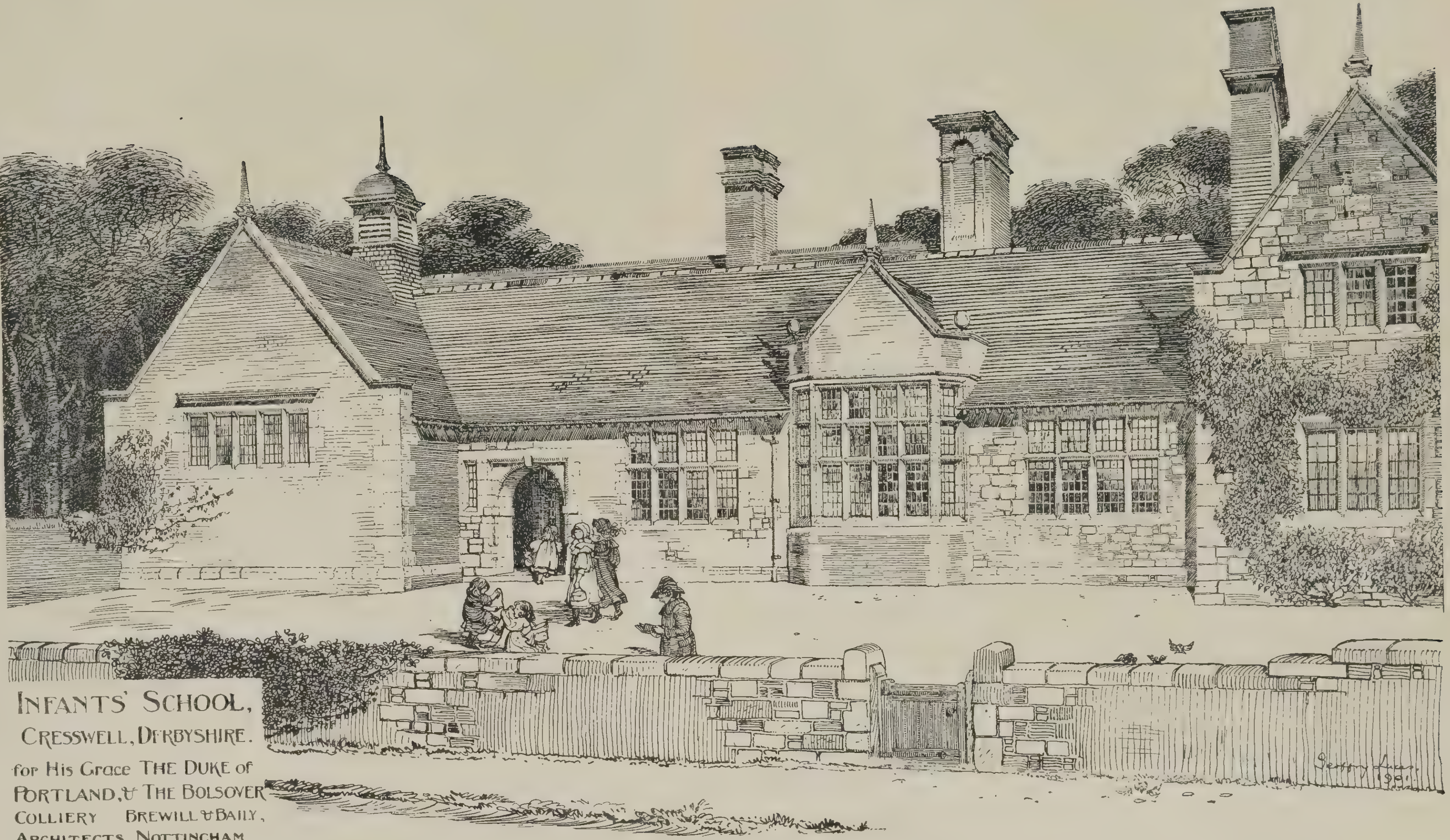

INFANTS' SCHOOL,
CRESSWELL, DERBYSHIRE.
for His Grace THE DUKE of
PORTLAND, & THE BOLSOVER
COLLIERY BREWILL & BAILY,
ARCHITECTS NOTTINGHAM

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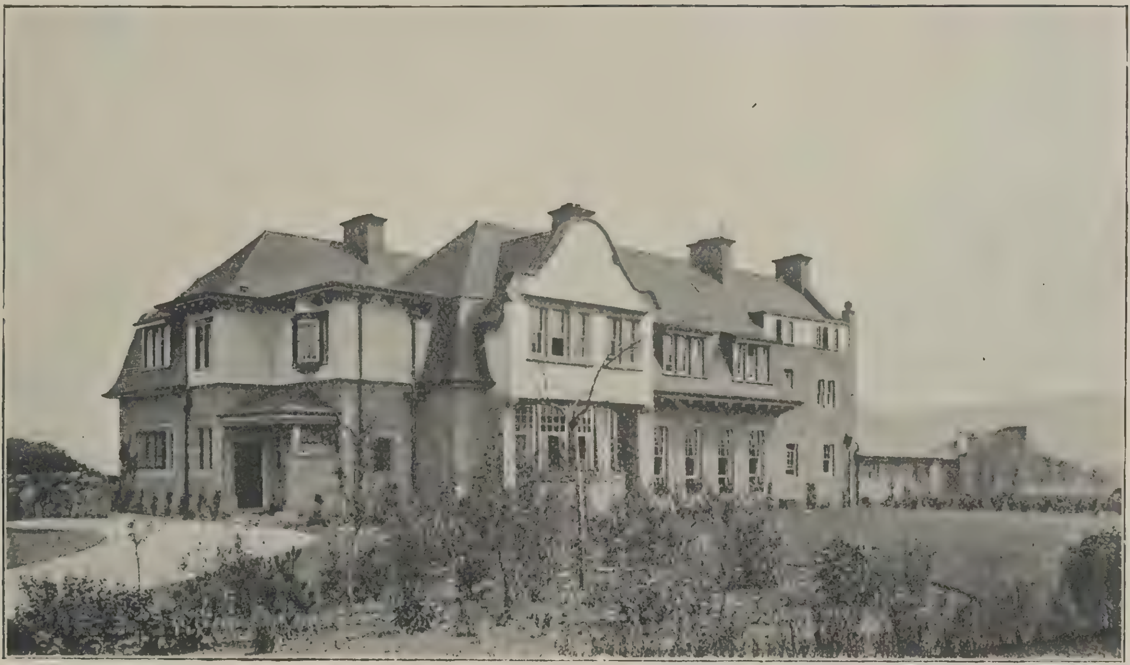
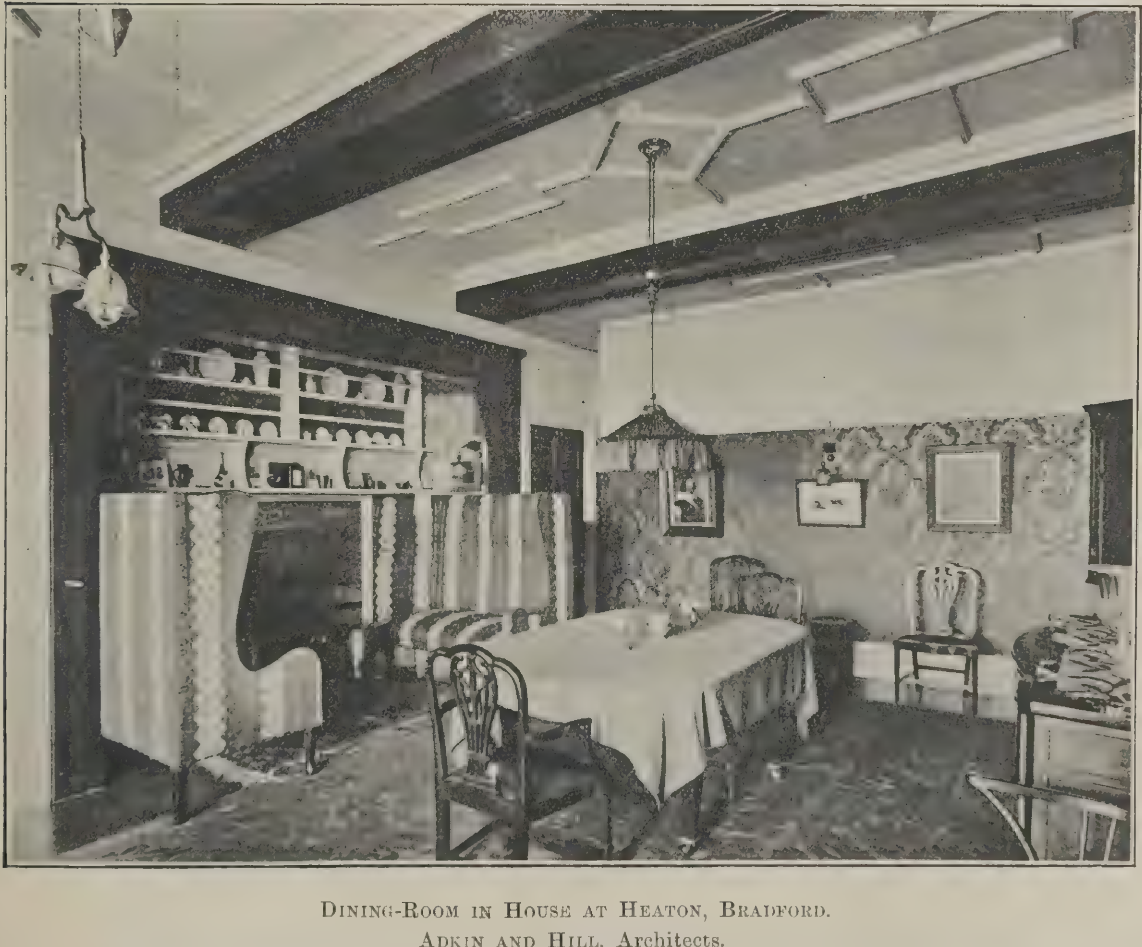


HOUSE AT BURLEY-IN-WHARFEDALE: ENTRANCE FRONT.



DINING-ROOM IN HOUSE AT HEATON, BRADFORD.
ADKIN AND HILL, Architects.

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Views & Reviews.

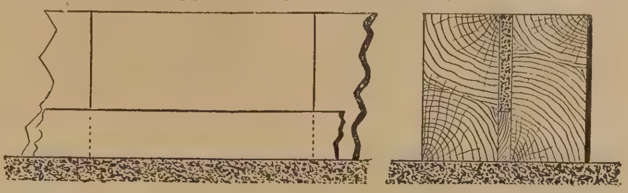
Machine Design.

Professor W. Cawthorne Unwin's "Elements of Machine Design" is now the recognised standard text-book upon the subject. When it first appeared thirty years ago there were not so many aids to the study of the application of scientific principles to all branches of engineering practice as now, and the large amount of experience was not then available; so that the task of writing the book was a most arduous one. Its success, however, can be judged from the fact that it has now reached its eighteenth edition. From time to time the book has been revised and enlarged, about one hundred pages having been added to this new issue. It has grown up with the advance in machine design and no useful departure has been omitted: yet the book has not become a large one. This most advantageous quality has been obtained by systematic digestion until every line in the book is replete with facts. The treatise fulfils its purpose of standing between works on applied mechanics and empirical books of rules and collections of examples of machine details. In common with the former, a summary of scientific rules applicable to the design of machines is given, and to some extent standard proportions and examples of details are included, and also empirical rules for cases which cannot be treated scientifically. A great part of the book deals with the region which lies between applied mechanics and rule-of-thumb methods, and this discussion of the various considerations which should be present in the mind of the designer of machines in applying scientific principles on the one hand, and which limit the reliance on purely practical experience on the other, forms perhaps the most useful portion of the book. It is here that machine design, as other branches of engineering, approximate to architectural design, the same balance between theory and rule-of-thumb obtaining in the one as in the other. Professor Unwin of course recognises that the correct teaching of the student is to give him a knowledge of the principles and train his mind to think elastically and deeply, so that he may apply the process of criticism to the problems as they present themselves. The following, with slight alterations, might be applied to the architect: "At every step the designer has to stop and weigh various considerations, the estimate of loads, the factor of safety, the limiting stress, the allowance for friction and wear, and many others. It is the multiplicity of these which render all practical problems in a sense indefinite, and from a purely scientific standpoint insoluble. But the recognition of them and the power of according to them their due relative importance in different circumstances is the distinction of the competent designer of machines." As the work deals with a branch of constructive design, though restricted to metallic materials, it is of interest and use to architect and engineer alike, and the chapters on materials, straining actions, strength of materials, riveted joints, bolts, nuts, keys and cotters form the best summary of applied mechanics and practical methods in iron and steel construction which we have seen. The book, in fact, has been used extensively by engineers as a handy reference book in designing girders, cantilevers and other metalwork, wooden beams, &c., and bridges, workshops, and in other branches of construction in the domain of architecture. It is to be hoped that the materials and forms of construction used by architects will be analysed and investigated in the near future as fully as iron and steel have been, and the practice of building put upon as good a basis as engineering workshop practice for the avoidance of the loss of information obtained by the practical experience of the men engaged in every branch of the trade. Further, we wish to see a book of building construction modelled on similar lines to Unwin's "Machine Design." The first part of the book dealing with general principles, fastenings and transmissive machinery is only as yet published in this new edition, but the second part, dealing chiefly with engine details, will appear shortly.

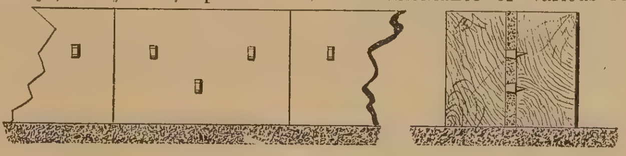
"The Elements of Machine Design: Part I., General Principles, Fastenings and Transmissive Machinery," by W. Cawthorne Unwin, F.R.S., B.Sc., M.I.C.E., &c. Price 7s. 6d. London: Longmans, Green & Co., 39, Paternoster Row, E.C.

The Art of Road-Making.

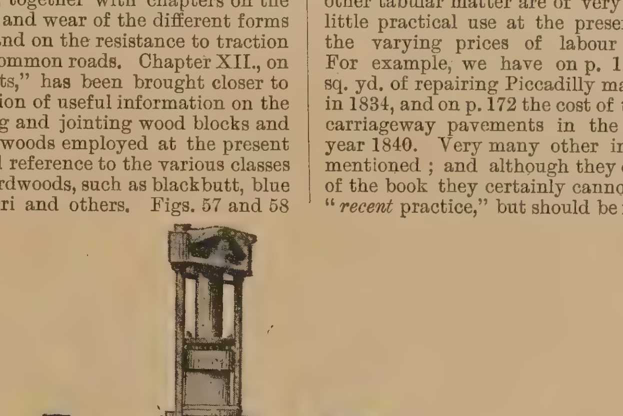
This is the sixth edition, revised, of this book, with additional chapters by A. J. Wallis Tayler, C.E., who is probably better known as the author of "Refrigerating and Ice-making Machinery" than as an authority on the subject of the work under review. The present edition is enlarged by about 120 pages, and the price is increased to 6s. The new matter consists principally of chapters on hard and preserved wood pavements, brick pavements and footways. To the appendix is also added a short supplementary historical sketch on the steam-roller, with a table of the cost of steam road-rolling, and bylaws made in 1857 as to the formation of new streets in the Metropolis. The earlier portion of the work, consisting of a "Historical Sketch" by D. K. Clark, and Part I. on the principles of the "Construction of Roads" by Henry Law, remains as in the former edition with little or no revision. Part II. deals with "Modern Practice in the Construction of Roads and Streets," and treats in detail of the various materials used in road and footway construction, including macadam and pitched roadways, stone, wood, asphalt and brick pavements, together with chapters on the comparative cost and wear of the different forms of construction, and on the resistance to traction encountered on common roads. Chapter XII., on "Wood Pavements," has been brought closer to date by the addition of useful information on the methods of laying and jointing wood blocks and on the principal woods employed at the present time, with special reference to the various classes of Australian hardwoods, such as blackbutt, blue gum, jarrah, karri and others. Figs. 57 and 58 are longitudinal and transverse sections of wood pavement showing joint with lath and stud distance pieces respectively between the blocks. The author rightly points out that the simpler the joint the better. The views as to level and contour of wood carriageways, the inclinations of channels and the foundations for wood-paving are largely those of Mr. G. H. Stayton* and give sound practical advice. In a useful chapter on "Hard-wood Pavements" the author recommends *close* jointing of the blocks, and as to the general mode of laying quotes liberally from a paper read before the Institution of Civil Engineers by Mr. Alexander Smith, M.I.C.E., on work of this class laid down by the Government in Sydney, and gives particulars of experience gained in London on hardwood pavements by several of the Metropolitan surveyors. Twenty years' observation of the London streets has, unfortunately, convinced the author "that less and less attention is being devoted to their cleansing, although the taxes have almost everywhere risen considerably." A new chapter is introduced on "Brick Pavements," and the merits of different classes of brick are well described. "Footpaths and crossings" are fully dealt with in Chapter XIII., and almost every class of material for paving, curbing and channelling is described. Reference is made to the growing use of artificial paving slabs, and the method of their manufacture is described. One unsatisfactory feature of the book is that so many of the tables of cost of maintenance of various road-surfaces and other tabular matter are of very old date, and of little practical use at the present day owing to the varying prices of labour and materials. For example, we have on p. 153 the cost per sq. yd. of repairing Piccadilly macadam roadway in 1834, and on p. 172 the cost of the reparation of carriageway pavements in the city *up to* the year 1840. Very many other instances may be mentioned; and although they occur in Part II. of the book they certainly cannot be considered "*recent* practice," but should be relegated to the historical section and new up-to-date tables and data supplied to take their places.



(Fig. 57.) LONGITUDINAL AND TRANSVERSE SECTIONS OF WOOD PAVEMENT, SHOWING JOINT WITH LATH DISTANCE PIECE.



(Fig. 58.) LONGITUDINAL AND TRANSVERSE SECTIONS OF WOOD PAVEMENT, SHOWING JOINT WITH STUD DISTANCE PIECES.



CONTINUOUS-ACTING MACHINE FOR MANUFACTURING ARTIFICIAL FLAGS.

"The Construction of Roads and Streets." By Henry Law and D. K. Clark. London: Crosby Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill; price 6s.

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* Proceedings of the Institution of Civil Engineers, 1884, vol. lxxvii., p. 244.

DOMESTIC HOT-WATER SUPPLY.

MR. FREDERICK MILAN recently lectured at the Huddersfield Builders' Exchange on "Domestic Hot-water Supply." By the aid of diagrams he showed what is described as the two-cistern system, said to be an improvement on the "L" boiler, as water could be obtained at any level under the cistern and reserve ; but it was open to great objection. Should the ball tap or supply fail, the store could be completely exhausted by drawing at the low-level tap, thus leaving only the boiler. With a good fire this would mean either serious damage or destruction to the boiler. The cylinder arrangement was a great improvement, but it was liable to derangement from several causes, such as stopping of the expansion or air pipe by frost, and the air pipe becoming choked by the formation of an ice plug, which hermetically sealed it at the water-level. Another objection to this system was that the cylinder being placed so far away from the boiler, sometimes with the object of heating the bath- or linen-room, a large length of circulation pipes had to be fixed, and the water in the pipes was liable to freeze. A further objection was that it was only single circulation. Mr. Milan showed the advantage of the cylinder system with a double circulation, which he acknowledged was the most perfect at present known and could be adapted in various ways to suit any class of building. Hot water could be obtained immediately the tap was turned, the cylinder supply could not be exhausted by drawing, and the whole of the water in the apparatus was in constant circulation. It was erroneous to think that kitchen boilers exploded because they were short of water, the sudden inrush of cold water causing a burst, and he stated that no explosion would occur providing the outlets were open. By means of a small apparatus constructed for the purpose Mr. Milan illustrated his remarks.

The chairman (Councillor J. Berry), commenting on the remarks made, expressed the opinion that it was a mistake to erect cisterns in the false roofs, as they not only froze there, but were inconvenient to get at when it was necessary to examine the fittings. With regard to the fixing of cylinders in the bathroom, they were not always able to persuade their clients to have them fixed in the kitchen owing to the heat they threw into the room.

GLASGOW'S NEW GENERAL HOSPITAL.

THE memorial-stone of the new General Hospital, which is being erected at Stobhill by the Glasgow Parish Council, was laid last week. The hospital covers fifty-two acres, will provide accommodation for 1,500 patients and 150 nurses and other members of the staff, and its estimated cost is £200,000. An admirable site, 350ft. above the sea level, has been secured on the lands of Stobhill, a short distance north-east of Springburn Public Park. The buildings are pleasantly situated and command a fine view of the Campsie and Blane valleys. They will be constructed of red sandstone and bricks, and will be perfectly equipped. The receiving block, the official block and doctor's house are placed at the main entrance, and are reached immediately on entering the gates; while the administrative block, consisting of general stores, kitchen, &c., is placed in the centre, so as to be easily reached from all parts of the building. This position, in addition to being central, presents another very decided advantage, as one side of it comes forward near to the low hollow of the ditch, a railway siding being brought in here so that goods will be discharged direct from the waggons into cellars below general stores, which they reach by means of an electric hoist. The laundry is also placed on this siding, so that the coal can be discharged from the waggons direct into the stoke-hole, thereby saving a very large sum annually for cartage. The disinfector and store for patients' clothes are placed near the laundry. An isolation ward is provided for suspicious cases; this is placed in an isolated position to the north of general hospital. The wards for children and the aged and infirm are placed on the west side of the site, and connected with general stores and kitchen by a central avenue. The nurses' home and doctor's house are also on this side. On the upper floor the accommodation is as follows :—Dining-room, drawing-room, bedrooms for three assistant medical officers, one spare bedroom, linen-room, and the necessary bath and lavatories, also service-room and housemaid's sink. The admission block is one storey in height, and consists of entrance hall, and on each side (one for the males, the other for the female sex) there are waiting-rooms, examination-rooms, bath-rooms and bedrooms. The whole of the wards are arranged so as to run north and south, in this way getting the maximum amount of sunlight. The isolation block is divided into four wards of four beds, thus allowing for two different diseases for each sex ; the cubical contents and also the arrangements being made in strict accordance with the requirements for fever and smallpox hospitals. There is also sleeping accommodation for the nurses, kitchen, and every requisite, thus making the block complete in itself, so that it can be kept perfectly isolated from the main hospital. The buildings are from the designs of Messrs. Thompson & Sandilands, of West George Street.

ST. HELEN'S CHURCH, WADDINGTON.

ST. HELEN'S CHURCH, Waddington, has recently been restored and re-decorated at a cost of £3,500. With the exception of the tower, which probably dates from the middle of the fifteenth century, the church has in the main been entirely re-built, the only old portion retained being the eastern responds of the arcade, which give the line of the old nave and the east window and wall of the south aisle in Garnett Chapel. The east window has been repaired and re-fixed, also the west window of the south aisle and the window of the north in Parker Chapel, which has had a tracery head added. The walls inside the tower have been pointed, the doorway and window repaired, the parapets reset and new pinnacles added. The new church is designed in keeping with the old work in the Early Perpendicular style and consists of a nave of four bays with north and south aisles, south porch, chancel, with Parker Chapel on the north and Garnett chapel on the south, with organ transept and choir and clergy vestries to the north of Parker Chapel. A special feature of the church is the continuous arcade without a chancel arch, which is peculiar to the Craven churches. The division of the nave and chancel is marked by a special principal with drop rafters and shafts and carved curves, the chancel roof being also kept somewhat lower than the nave. The nave is lighted by three-light clearstory windows, and the aisles, which have battlemented parapets, by three- and four-light windows. The roofs are of oak covered with flag slates. The passages are flagged and the seat blocks paved with oak wood blocks laid in asphalt on concrete. The chancel floor is paved in pattern with blue and yellow flag and Sicilian white marble. The old choir stalls and Parker Chapel seats have been re-fixed and the nave is seated with chairs, simple oak seats and font being fixed in the nave. On the north side of the chancel an old doorway was discovered under the plaster, built up. This has been opened out into the Parker Chapel. Here an oak screen across the Parker Chapel has has been remodelled and fixed, as much of the old work as was suitable being used. The old stained glass has been repaired and re-fixed by Messrs. Shrigley & Hunt of Lancaster. The heating is on the low-pressure system by hot water. The west window has been given by Mr. Waddington of London. The work has been carried out by Messrs. Veevers & Sons of Clitheroe, with the following sub-contractors: Mason, Mr. J. Bleazard ; slater, Mr. J. Robinson ; plumber, glaziers and heating, Messrs. Watson & Sons ; all of Clitheroe, under the supervision of the architects, Messrs. Austin & Paley of Lancaster.

Mr. James Reid, of Glasgow, has been appointed Clerk of Works in connection with the erection of the new Market Hall for Leeds. The Market Hall, which will be built from plans prepared by Messrs. Leeming and Leeming, architects, will cost about £100,000.

DRURY LANE THEATRE.

THE interior of the Theatre Royal, Drury Lane, has within the past few months been undergoing a great change, and is almost out of the hands of the contractors. The first thing observable in the new arrangement is the improvement in the auditorium—by bringing forward both the grand and the first circle by a largely increased sweep. The large and cumbrous boxes that formerly occupied so much space on the ground floor have been entirely dispensed with, and a better line of sight ensured from the pit and the stalls. The latter were formerly not the most comfortable in London, and access to some parts of them was both difficult and inconvenient. Now not only are the stalls accessible from either end, but two large alleys have been constructed down to the right and left of the centre line, and the stalls arranged in a gentle curve, so that those who are seated at the ends have not to twist their heads to secure a view of the stage. The old and ugly pit barrier has been removed, and is replaced by a brass rail and light curtain. The stall seats themselves are upholstered in Russian leather, which is cleaner and cooler than the material usually employed. The theatre has been entirely re-decorated, the scheme being white and gold. The boxes are draped in amber, and the passages decorated in white and amber, which renders them light, airy and cool. A warm reddish paper completes the background in the auditorium, and the stalls are carpeted in deep red plush. Draughts, it is hoped, will not be perceptible in the future. An elaborate system has been introduced whereby hot and cold air can be pumped into the theatre when necessary. The orchestra has been partially sunk, so that the heads of the players will no longer obtrude between the audience and the stage. In order that no inconvenience may be experienced by the sudden extinction of light, two complete and entirely separate systems of electricity have been installed. Needless to say that the re-arrangement of Drury Lane Theatre affords greater seating capacity than heretofore.

Surveying and Sanitary Notes.

A New Level Drive from Eastbourne to Willingdon is to be constructed by Messrs. W. L. Wallis & Co., whose tender is for £3,592, inclusive of roads through The Decoy.

"Deadened" Red-Gum, which has recently come into prominence in regard to the Westminster paving scandal, derives its name from the method of seasoning the wood. To "deaden" wood is to season it before the tree is felled. This is effected by the process known as "ring-barking." A ring is chipped with an axe into and round the tree through the bark a few feet from the ground during the winter months. When the spring comes the sap does not rise again and the tree dies. Red-gum blocks from trees that have been deadened in this way for eighteen months before they were felled are what are said to have been called for by the Westminster Council's specification.

The View from Richmond Hill.—Some anxiety has been occasioned in connection with the prospect of saving the view from Richmond Hill by the action just taken by the Twickenham District Council, whose assistance in the purchase of Marble Hill and the adjoining land required will be a material factor in the scheme. The council has just resolved to purchase Radnor House and grounds, which front on the Thames some distance above Eel Pie Island, quite round the bend of the river and out of the view, together with the small island lying alongside them. There is at present a difference of a few hundred pounds in the prices offered and asked for, but this is not expected to be an obstacle. The estate will be laid out as a recreation ground for the west-end of the parish at a cost of £5,000 or £6,000. The matter is being very hurriedly pushed through ; and it is anticipated by many that when the council are asked to contribute to the other scheme they will excuse themselves from doing much on the ground of the heavy expense incurred at Radnor House, thus leaving it to outside effort mainly to find an open space for East Twickenham

Bricks and Mortar.

APHORISM FOR THE WEEK.

Architecture exhibits the greatest difference from nature which may exist in works of art; it involves all the powers of design, and is sculpture and painting inclusively. It shows the greatness of man, and should at the same time teach him humility.—COLERIDGE.

Our Plates. THE Cresswell Infants' School has been carried out for his Grace the Duke of Portland and the Bolsover Colliery and consists of converting the old schoolroom into a central hall and adding a bay window and other details; also in providing new classrooms, &c., to accommodate 240 children, cloak-rooms and other necessary accommodation. The old Mistress's Cottage has only been very slightly altered. The old school was erected with the local stone, and the additions have been carried out in brick with local stone dressings, the roof being covered with green slates; the windows have iron casements and lead lights. The drawing is by Mr. T. Geoffry Lucas.—The church of St. John the Baptist, South Witham, is one of the most interesting of Lincolnshire churches, containing Gothic architecture of the following periods, Norman, Early English, Decorated, and Perpendicular; it has nave, north and south aisles and transepts. The chancel is entirely cleared away. The plan is somewhat unusual, as both aisles taper from west to east, at the west end being 7ft. 6in. wide, and tapering to 5ft. at the east end. The north arcade consists of three bays, supported by beautiful circular Norman shafts, from which spring semi-circular arches. The south arcade consists of three bays, having Early English octagonal shafts and richly-moulded caps with pointed arches. The western respond to this arcade is Early English, with a finely moulded cap with nail head enrichment. The eastern respond is octagonal with a beautiful foliated cap. The west end is Early English and has on the exterior three plain buttresses, the gable being surmounted with an open bell turret containing two bells. The south transept is Decorated and the north transept is Perpendicular, the windows in each being very fine. The restoration consists of a new chancel, vestry, and organ chamber; also entirely restoring and re-roofing the nave, aisles and transepts with oak, and the whole will be covered with Colly-Western stone slates. The old high pews are taken away and the church will be repaved with stone and wood blocks and will be reseated with chairs. A cement channel will be formed round the whole of the church and the exterior stonework, &c., will be carefully restored. The drawing is by Mr. C. E. Mallows.

The Statue of Peterborough Patron Saint. THERE is a statue of St. Peter (to whom Peter's borough—the modern city of Peterborough—was dedicated early in the thirteenth century, immediately after the Prince of the Apostles had been elevated to the chief place of honour, high up and nearly out of sight, on the great Façade of the minster, then a Benedictine Abbey) which has just been photographed for the first time from the scaffold erected by the contractors to the Restoration Committee, Messrs. John Thompson. It is situated on the topmost part of the magnificent gable of the Cathedral front, under the rich floriated cross which crowns the apex. Some idea of the enormous size of the cross may be had when we say that with the base it is about 7ft. long and 4ft. across the arms, a measurement which roughly tallies with the size of the seated statue of St. Peter himself. It must have been the occasion of a great festival away back in those early years of the thirteenth century when the great cross was erected above the lordly statue of the fisherman with the keys; and when the monastery and the tiny town which had grown around its walls were placed under the special protection and patronage of St. Peter, whose representation, though lost to view in these eeric heights, was to be a perpetual reminder to the world of the distinction thus conferred. Four times previously had the settlement we now know as Peterborough undergone a change in name. It was Medehampstede during the Anglo-Saxon and Anglo-Norman dynasties; afterwards Gildenburgh from its riches or gilded minster; next it bore the name of Burgh, or Burigh, from its fortified walls; and lastly Peterburgh or Borough, the minster and town dedicated to St. Peter. Before the west front proclaimed the completion of the present church (*circa* 1237) two other churches, with their monastic buildings, had been burned to the ground—one by the marauding Danes who slaughtered the whole of the brotherhood and plundered the church, and one burned by accident. From an archælogical point of view the statue is additionally interesting, for if the belief of the late Mr. J. T. Irvine is true that the west front above the main string was hurriedly reduced in design, there is shown here the amazing skill of the master mind, whose ingenuity made up for the statuary being denuded of their canopy arches by incorporating the heads of the niches with the ornamental cusped copings of the gables. The right hand alone is missing from the figure. This hand would originally be raised with its two fingers extended in the act of blessing. The keys of authority, like most other parts of the statue itself, have wonderfully survived the disintegrating agencies of seven centuries' exposure. It is executed in Barnack ragstone, and rests upon a base of Alwalton marble which had crumbled and which has since been renewed. The statue itself will remain untouched. There is no record as to when the hand fell. The beautiful dominating cross has had a fragment of the outer floriation at the extreme top replaced, but beyond this it seems as perfect as when the masons left it.

School of Art, Keswick. THE workers of the School of Art, Keswick, inspired by a lecture delivered to them by Canon Rawnsley, have made and presented to the Mayor and Corporation of Winchester a large silver rose-water dish in commemoration of King Alfred. The dish is of beaten silver and enamel work and bears the inscription, in the letters designed by Albrecht Dürer: "I desire to live worthily all my days, that after death I might leave to my successors a memory of good work done." Canon Rawnsley, who took part in the Millenary Celebration, is himself the designer of this beautiful work of art, and the employees of the School have made it out of their regular working hours. The School of Art at Keswick was founded about thirteen years ago, chiefly through the exertions of Mrs. Rawnsley, who was anxious to give some of the inhabitants who find it difficult to procure work out of the tourist season employment through the winter. The complete success of the undertaking is highly gratifying. The school is now on a perfectly sound, self-paying basis. It inhabits a beautiful creeper-clad building situated in a little garden hard by the Greta Bridge. Much work, chiefly in metal, of a high artistic value is turned out every year and finds a ready market.

The Alfred Millenary Commemoration. THE celebration of the millenary of King Alfred the Great was begun on Wednesday last at Winchester, which city was the ancient capital of his kingdom and here he, the great Wessex king, spent his boyhood and grew to manhood, and held his court after he had broken the power of the Danish invader; and finally was laid to rest at Hyde Abbey in the city. Winchester was famous in Alfred's day for its trade and commerce and for its guild of merchants, the precursors of our own London guilds. On Wednesday morning the visitors first went to the ancient West Gate, which stands at the top of the High Street. Here only Roman remains are to be found. The Castle Hall was then visited, where Mr. W. Portal lectured on its two Norman walls and the reputed table of King Arthur hanging upon one of them. On Thursday the delegates visited Winchester College and Wolvesey, hard by the College. Although Norman remains here again asserted themselves necessarily most conspicuously in the ruins of Henry de Blois' castle, the delegates were also on the grassy site of the old palace of the Saxon kings and nearer to Alfred's dwelling-place in Winchester than they had yet been. Mr. N. C. H. Nisbett, A.R.I.B.A., who was in charge of the delegates here, referred to tesselated pavements discovered underground to times far more remote—those Roman days which were to Alfred in his day nearly as far off to him as his times to us. But here, at all events, was the undoubted site upon which he had gathered round him the learned men of the world he knew. A bit of the irregularly embrasured wall at the far end of the green enclosure had been identified as Saxon work. The old palaces had unquestionably been used in building up what was the new castle in the days of Henry of Blois. Of Saxon work, as usual, there was little or nothing to be said, and only chances for conjecture; but the Norman columns of the palace which was there before this ruin, were shown embedded in it sometimes to strengthen its fortress-like character, sometimes for sheer indifference to their previous uses. The head of a column laid in a horizontal direction served will enough for a door jamb. What cared they in those days when such material was at hand to what altered uses it was put? There was a small diagram in Mr. Nisbett's hand showing by differently tinted lines the ruins as they stood and, as excavation had shown, how the walls ran when complete. Mr. T. W. Shore, of the London and Middlesex Archæological Society, added an apppreciated speech concerning the two Winchesters, the Winchester of the bishops and the Winchester of modern kings. In the Castle Hall Sir John Evans, the president of the Numismatic Society, dealt with the most tangible evidences of King Alfred's reign—his coinage. Sir John Evans, in the preface of his lecture introduced an interesting reference to the Alfred Jewel, about the use of which there has always been speculation. Some had supposed it to be an ornament for Alfred's helmet, but Sir John Evans thinks it more probably was the head of a pointer for pointing out to the reader the line which he had reached in his reading. On Friday Mr. Hamo Thorneycroft's statue of King Alfred was unveiled by Lord Rosebery. The statue is on a lofty pedestal in the Broadway, Winchester, against the splendid background of the terraced hill of St. Giles, and looks towards the ancient West Gate. The sculptor has portrayed the King with a beard, notwithstanding the tradition of the coins referred to by Sir John Evans, for Mr. Thorneycroft does not believe that the moustachios and divided beard agree with the highest ideal face of the Saxon type.

British Sculptors. MR. M. H. SPIELMANN, who has been engaged for some time past in writing a book on "British Sculpture and Sculptors of To-day," has finished his task, and the volume will be published by Messrs. Cassell & Co., Ltd., early in the autumn. He was impelled to the writing of this book by two things: first, the absence of any book dealing with the subject, and, secondly, by the discussion which was raised on the subject of the Queen Victoria Memorial. He had long waited in vain for the appearance of a book on British sculpture, and the discussion about the memorial and the remarks which were publicly made concerning our alleged English incapacity to produce monumental work led him to undertake the task. "The practice of sculpture," said Mr. Alfred Gilbert last year in one of his lectures at the Royal Academy, "exacts more from the individual than any other branch of art, and demands greater sacrifices, seeing that fewer people in the world understand it." Mr. Spielmann's book has been written for the public, and especially for those who, as collectors and memorial committee-men, give commissions for sculpture. Chapters will deal with "The Bane of Committees," "The Patronage of Sculpture," "The Materials for Sculpture," and the delicate question of the relative position of the sculptor and the architect when working together. The introduction will be followed by critical estimates and descriptions of the work of about eighty living sculptors and metal-workers, arranged according to their seniority as exhibitors. Two hundred illustrations will accompany the text, and the book promises to be as useful to the artist and critic as to that section of the public for whom it is primarily intended.

BUILDING CONSTRUCTION.

1. THE thoughtful person engaged in any kind of constructive work must recognise two opposite tendencies, or tendencies which may be stated as opposites, namely (*a*) The feeling that to be most effective one must be a specialist, and (*b*) that to be an effective specialist one must have general knowledge. Building construction is so wide a subject that there is room within it for many special departments, but the exponents of these departments should have a working knowledge of the whole subject. Moreover, circumstances of time and place make what may be called the general practitioner of the science the only man available. The object of these lessons is to develop that knowledge which is the stock in trade of the general practitioner in building construction.

To keep to this design it will be necessary, after assuming a standard of ordinary school knowledge, to frequently refer students to other works for further information in special departments. Students are not told here at the beginning to prepare themselves for the subject by first becoming geologists that they may understand quarries; physicists, to understand temperatures, expansions, contractions, forces; chemists, to know the compositions of cements, pigments, &c.; mathematicians, to investigate quantitatively physical questions, &c.: sanitary, electrical, gas, mechanical and civil engineers. The subject covers all this ground, and knowledge in every department named will be found to be of use; but fortunately these need not be looked upon as a succession of vestibules to the inner sanctuary of building construction.

Drawing is absolutely necessary in connection with the practice of every constructive art where definite instructions have to be given to second or third parties, but it is also necessary to the workman who is doing anything for the first time. The student should have some preliminary knowledge of drawing with instruments, but he may expect that as he proceeds with these lessons his drawing will improve. The sooner he leaves the mere drawing of copies from cards and takes to drawing from notes and dimensions the better.

The value of pressing forward cannot be too strongly impressed on students. By pressing forward is not meant going forward imperfectly understanding what ought to be known. It is a common mistake however, to suppose that iteration is teaching. One may spend much time in multiplying, adding and dividing abstract numbers, and become expert in this way, but expertness, and much besides, results from actual useful work with figures in concrete examples. The student must know the ordinary arithmetic taught in elementary schools, and he should push on and know mensuration. For his elementary drawing he will have some knowledge of curves and solids, and these things should combine themselves and urge him forward to a knowledge of geometry and algebra. The way is long, but let the student not be too easily frightened with names; he may occasionally be surprised to find that, without intending it, his operation may be called "Trigonometrical" or "Conic section," or "Calculus."

Building Construction when it is called "Architecture" is held to be a Fine Art. Looked at from this standpoint, the subject is different. In "Building Construction" we are behind the scenes with the stage carpenters; in "Architecture" we are among the spectators, viewing a result. We may dissect a flower, show the embryo seed vessel, count the stamens and petals, and explain their functions—and these things have a beauty of their own; but apart from this, and from our own knowledge of the functions of its parts, the flower is beautiful. We say God made the flower, in explanation of its beauty. What are the agents? Some earth, some rotted leaf-mould and some shelter from the wind and frost, in addition to the common sunshine and rain. Everything that we have the name of creating should at least have the beauty of honesty and fitness for its duty.

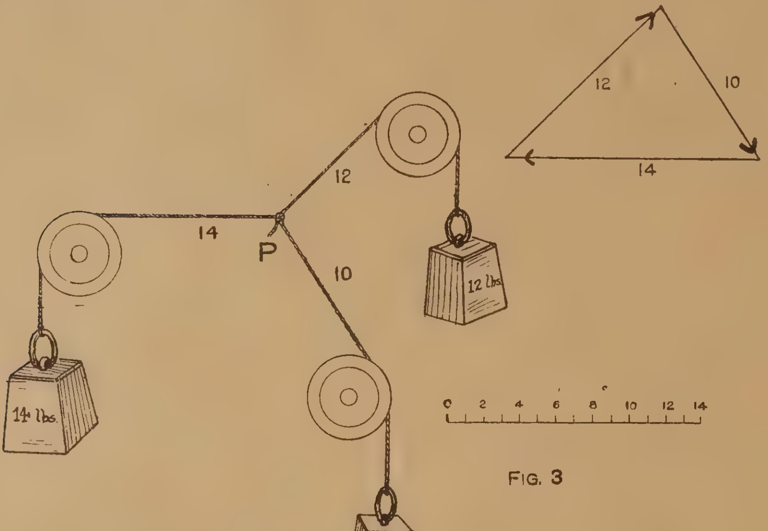


FIG. 3

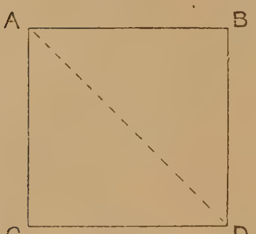


FIG. 1

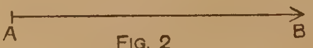


FIG. 2

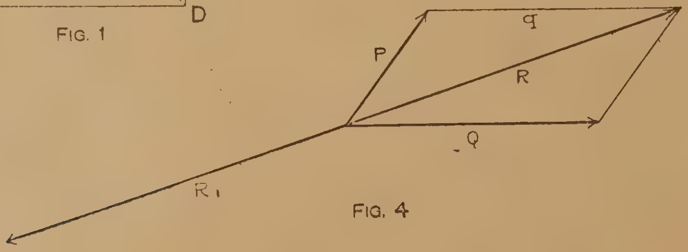


FIG. 4

In several ways we have probably attained the highest pitch of beauty; nothing can ever excel ancient sculpture of the human form, just as the very best has been done in epic poetry; but as for us moderns there are new worlds of fact, so there are new worlds of beauty.

UNITS.—DEFINITIONS, &c.

2. It is practically inconvenient to make the same units of quantity serve for all purposes; just as large quantities of commodities are stated in tons and small quantities in grains, so it will be necessary to vary the units to suit the circumstances. I shall try to make use of such units as are familiar to students, such as are in common use in the building trades in these countries and in America.

Dimensions.—As a rule the unit of dimensions will be the standard foot. I shall refer to the lineal foot, the square foot, and the cubit foot. I may have occasion to use the inch, the square inch, and the cubic inch.

Force.—If a one-pound weight is suspended by a string, there is a tensile stress in the string; this stress varies slightly at different parts of the earth, but it is always the same at the same place, say London; it varies *very* slightly within pretty wide limits of area. If we take a spring balance and graduate it in pounds at London, such a balance will accurately indicate forces in pounds wherever it may be used. The stress produced in a string carrying a one-pound weight at London is the unit of force. If the string with its weight is hung from a nail, the nail is pressed on its upper side with the force of one pound. The same pressure may be produced by pushing the nail downwards from above, using a short piece of stick; in such circumstances, the stick bears a compression stress of one pound.

3. *Force of Gravity.*—The word force is used in a different sense by persons who speak of the *force of gravity.* When a one-pound weight is suspended by a string, the attraction between the mass of the weight and the mass of the earth is balanced by the stress in the string. We can double the stress by doubling the weight and in this way, by adding weights, we can make the force of gravity very great. But *the force of gravity* is spoken of as an invariable thing and it is said to be equal to 32 (roughly). If any weight whatever be allowed to fall freely (for reasonable heights and neglecting the effect of the resistance of the air), it will be found that at the end of the first second it will have a velocity of 32ft. per second; at the end of the second second it will have a velocity of 64ft. per second; and generally at the end of any number n of seconds its velocity will $32n$, and the rate of increase of velocity (*acceleration*) is 32ft. per second per second. It is found convenient to call this acceleration *gravity*—it is inaccurately called the force of gravity, it varies at different places on the earth. It is usual to designate the acceleration by the letter g, and we speak of the g or gravity of the place.

4. *Mass.*—The standard one-pound weight is a definite quantity of matter. The number which expresses the weight of a body as being equal to so many pounds expresses the mass of the body, and the standard pound might properly be taken to be the unit of mass. I have taken the stress produced in a string by the mass of a pound suspended from it at London as a unit of force and I have called it the force of a pound, and I might also speak of the mass of a pound; but for the purposes of formulæ and calculation it is found advisable to have as the unit of mass g lbs., that is, the unit of mass is, roughly, 32 lbs. I adopt these units because they agree most nearly with the ordinary ideas and language of people in practice. (It may be noted that in some books the one-pound weight is taken as the unit of mass and $\frac{1}{g}$ lb., or, say $\frac{1}{32}$ lb., called a poundal, is taken as the unit of force.)

5. *Pressure or Distributed Force.*—If we float a rectangular box in water and load it (1) so that its bottom side is horizontal, the pressure between the water and the bottom of the box is a uniform distributed pressure; (2) if the bottom of the box is not horizontal the pressure is distributed, but not uniformly. We may imagine the area divided into a great many small parts and each part pressed by a small force; the sum of all these forces is equal to the total pressure on the bottom of the box. In the first case the

pressure per unit of area is the total pressure or weight divided by the area of the bottom. In the second case the pressure per unit of area varies; we may speak of an average pressure per unit of area. When we set a dressed block of stone on a bed of mortar the mortar is supposed to uniformly distribute the pressure or weight of the stone and all that rests upon it over the stone on which the bed of mortar rests.

The pressure of water against the sides and bottom of a tank is distributed pressure; so is the pressure of the steam and water in a boiler against the inner surface of the boiler.

A cubicle box—a cubic foot—is filled with water and rests with one face horizontal: the total pressure on the bottom horizontal face is the weight of a cubic foot of water, 62·4 lbs.; this is also the pressure per sq. ft., and the pressure per sq. in. is $\frac{62{\cdot}4}{144}$ lbs. $=$ ·43 lbs.

Consider one of the upright faces represented in cross section by the line A C. The pressure per sq. in. at C is the same as the pressure per sq. in. on the bottom C D. The pressure varies uniformly from that at C $=$ ·43 to the pressure at A which is 0, so that the average pressure $= \frac{{\cdot}43}{2} = {\cdot}215$: the total pressure on the face is $144 \times {\cdot}215 =$ 31·2 lbs: that is, the pressure on each upright face is one half of the pressure on the bottom face.

5. When a weight hangs by a string it is easy to feel that the stress at every part of the string is the same (neglecting the weight of the string), but it is not at all easy to believe that when a strong man overcomes a weaker one, and drags him by a string, the stress or pull is as great at the weak man's end as at the strong man's end, though it is so. The student cannot hope to see this clearly till he understands the effects of forces on masses free to move in the directions of the forces. If instead of two men pulling a string in opposite directions we consider a locomotive dragging a train by a rope: the train exerts no opposite pull—the locomotive does it all—but the rope is manifestly in tension. The question is complicated by considering the friction of the train. Imagine the train to move without friction, then the pull in the rope is producing an acceleration of speed in the train, and if we observe the acceleration and know the mass of the train we can calculate the pull in the rope; *it is equal to the mass multiplied by the acceleration*—in the units which have been adopted. In actual practice it is more than this by the amount of friction (we have assumed our train as being on a *level* piece of railway). The student should try to have a proper notion of what is meant by "acceleration," *rate of increase of speed:* it is expressed as a speed or velocity per second: as so many feet per second per second—note that time comes into it twice. In our units

$$\text{velocity } v = 2\,\frac{\text{feet}}{\text{seconds}} = \frac{\;}{t} \qquad (1)$$

$$\text{acceleration } f = 2\,\frac{s}{t^2} \qquad (2)$$

Let us put these two laws in the forms

$$s = vt \;(1) \text{ and } s = \tfrac{1}{2}ft^2 \qquad (2)$$

But $v = ft$ and there appears to be a discrepancy: there is, of course, none: (1) supposes the distance s to have been moved over with a uniform velocity—ft is the velocity, often t seconds from starting at nought, and the average velocity $\frac{ft}{2}$ compares with the uniform velocity v of (1).

6. If we desire to test whether there is more stress in one part of a rope than another it may be done by pulling up parts of the rope and putting in spring balances,—with a steady pull, these balances should all read the same if what has been said above is true.

The rope is elastic, and, if we could accurately show the amounts by which different forces lengthen it, it would form a spring balance. It would be found, if, for example, a force of 100 lb. stretches it so as to be 1in. longer, 200 lb. will make it 2in. longer, 300 lb. will make it 3in. longer, and so on, within limits. Again, if a strut is subjected to compression it is shortened, and the amount of shortening is proportional to the load. Let us take a bar of iron which will bear both kinds of stress. The amount by which a pull of, say, one ton will lengthen it is equal to the amount by which a thrust of a ton will shorten it; if we express this increase or decrease as a fraction of its length it is called the *strain*; the force is called the stress, and the law (called Hook's law, sometimes expressed in Latin *ut tensio sic vis*) is that strain is proportional to stress. Just as in spring balances with light springs the divisions of the scale are long compared with those with stiff springs, so different substances also vary as measurers of force. It is found useful to have a list of numbers which have been determined by experiment and which give in a convenient form a means of knowing their scales considered as measurers of forces. The number for a particular material is known as Young's Modulus for that material. This number might be given as the force in pounds which would elongate or compress a bar of 100 square inches section by $\frac{1}{100}$ of its length, but it is just as useful to say that it is the force which would elongate a one-inch bar to double its length, or compress it to no length, though it is manifest that no material will stand treatment of this kind.

The student is to remember that the word elasticity is used frequently with different meanings. Young's Modulus is called the Modulus of elasticity of a material, and it means a very different thing from co-efficient of elasticity when we are dealing with questions of impact, &c.

7. The term *momentum* gives some difficulty. If we return to our idea of a frictionless train being drawn by a rope, in which there is a constant stress or force, the train is accelerated acceleration $F = \frac{\text{force}}{\text{mass}} = \frac{F}{m}$: and the velocity after T seconds $= t\frac{F}{m}$. Now the effort of a force acting on a mass free to move for a definite time is $t\,F$, which is evidently $mt\,\frac{F}{m}$ or mv. In Newton's law where the change of motion is said to be proportional to the force, the change of *momentum* is meant, and the element time is understood; the change of motion is proportional to the force and the time during which the force acts.

We are now more concerned with accumulation of energy than with momentum. Energy of motion is imparted when a force acts upon a mass free to move *through a distance.* Energy $E = Fs = \frac{mvs}{t} = mv\,\frac{s}{t}$ but $s = \frac{vt}{2}$ where v is the final velocity $\therefore E = \frac{mv^2}{2}$.

Students who have gone over the ground in books on elementary mechanics will find it useful to look at things from the point of view here taken. Students who have not had a course of elementary mechanics may find it not easy to follow what has been said owing to imperfect knowledge of some of the terms used, but they should have no great difficulty in making up the meanings of these terms from books dealing specially with mechanics.

(*To be continued.*)

Law Cases.

Cellar Flaps: A District Surveyor's Summons Dismissed.—Mr. Charles Ansell, builder, of Chicheley Street, York Road, was recently summoned at the North London Police Court by Mr. Payne, district surveyor for East Hackney, for contravening the London Building Act in doing certain work at the Brunswick Arms public-house, Hackney. Mr. Payne's case was that the defendant had placed a new flap to the cellar of the public-house without giving him notice as district surveyor, and had used in the construction deal instead of some hard and incombustible material.—Mr. d'Eyncourt said a cellar flap could not be made of anything but wood. The Act of Parliament, moreover, gave them no ground to go upon, and the summons would be dismissed with £3 3s. costs.

Mr. Thomas Harper Wallis, builder, of Littlehampton, died recently at the age of 81 years. He went to Littlehampton about twelve years ago from Market Rasen, Lincolnshire, where he carried out many large contracts, including the building of several churches for the late Sir John Astley, but since going to Littlehampton the business has been carried on by his son, Mr. Walter Wallis.

Builders' Notes.

Mr. William Young, a well-known builder, of 114, Clapham Park Road, died last week at the age of 55. He carried on the business started by his father, the late Mr. William Young.

Woking By-laws.—A by-law has been adopted by the Woking Urban Council exempting from the operation of their by-laws, with respect to new streets and buildings, any building intended to be used exclusively as a cycle shed or toolhouse, which is erected 10ft. or more from any other building, and which is not heated otherwise than by hot water.

An Increase in Bankruptcies is shown in the Board of Trade Report for 1900–1901, dealing with the subject. In the groups of particular trades, the largest number of failures is in building, where 155 more cases and £421,396 more liabilities than in the previous year are recorded. Following, as this does, a large increase in the previous year over the preceding three years, it is clear that this trade has received an abnormal and unhealthy development.

Walsall's New Municipal Buildings.—The Municipal Buildings Committee have accepted the tender of Messrs. Armitage and Hodgson, of Leeds, to erect the new premises for £67,650. The plans which have been adopted are those sent in by Mr. James S. Gibson, and include new council chamber and committee rooms, offices for the various corporation officials, and a new town hall to accommodate about 1,700 people. The site for the new building is in Lichfield Street, and is central. The plans are drawn so as to permit the erection of an art gallery in the future if that is deemed desirable.

Change of Address.—Messrs. J. Owen & Sons, Ltd., the well known timber merchants, late of Brownhills Saw Mills, Tunstall, have removed in order to accommodate and provide for their increasing business to larger and more convenient premises, at the corner of Pinnoy Street and Scotia Road, on the tramway route between Burslem and Tunstall. They have purchased a suitable site and have built a saw mill and fitted it up with all modern machinery, including horizontal, frame, band and circular saws, planing and moulding machine, &c. Timber sheds which will store large quantities of dry woods have been erected, and there will be a siding communicating with the railway company.

Bath Stone Firms.—A satisfactory report is issued by the Bath Stone Firms. The profits for the first half of this year are returned at £19,364, and though this total is some £1,600 smaller than the corresponding figure a year ago, it does not indicate any diminution of prosperity, as interest on new debenture stock this year called for £1,760 extra. The dividend is again at the very satisfactory rate of fourteen per cent. per annum and thanks to the larger balance brought into the accounts, the amount carried forward is also larger, being £17,072, as compared with £14,678 a year ago. The company appears to be in a very strong position, and does not seem to have suffered at all by the numerous failures that are reported in the building trade.

Registration of Plumbers.—The Lord Mayor of Birmingham, at a meeting of master and operative plumbers held in the Council House last week, referred to the evils of bad plumbing, which, he said, were great and far-reaching. In presenting a number of certificates granted in connection with the National Registration of Plumbers he emphasised the importance of duly qualified men being engaged in trades which were so closely identified with the health of the community. He said it was gratifying to find that the reforms which were taking place in the trade were not forced upon them by outside pressure, but arose from an almost spontaneous conviction of the masters and men to uplift the trade and secure for it public confidence. A resolution was proposed by Mr. Bellamy, master plumber, seconded by Mr. Clarke, operative plumber, affirming that, in the opinion of the meeting, representing the masters and operative plumbers of Birmingham and the district, it would be a great public advantage if a measure be passed through Parliament securing an efficient system of registration, and urging that it is the duty of the Government to carry through such a measure in the public interest.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

To Prevent Paint Blistering.

W. G. writes: "How can I prevent paint blistering?"

A frequent cause of blistering is the application of paint to damp surfaces or to woodwork containing a large amount of resin. To prevent blistering, the paint should be of good quality, having pure old white lead as a basis. For external work, boiled linseed oil should be used, raw linseed oil being confined to internal work. Care should be taken to avoid the use of too much oil in paint, as an excess of oil also tends to blistering. The surface to be painted should be perfectly dry, and in the case of woodwork the timber should be well seasoned. Each coat of paint should be allowed sufficient time to get thoroughly dry and hard before the application of the succeeding coat. T. E. C.

Colouring Plaster Green.

SOUTH SHIELDS.—ENQUIRER writes: "Which is the best material to use for colouring plaster skimming green?"

We know of no means of colouring plaster green permanently or deep in tone. Lime is quickly destructive of most greens, but many paint manufacturers and merchants supply "lime greens," specially prepared for plastering.

Timber Sizes.

BROTTON.—CONSTANT READER writes: "(1) Kindly give the market sizes of timber used in ordinary buildings. (2) Please also name the best book for obtaining a good and practical idea of specification writing?"

(1) Timber is mostly imported into this country in the following sizes: Deals, 9in. by 3in., 9in. by 4in., and 11in. by 3in.; battens, 7in. by 2½in. and 7in. by 3in. Smaller sizes are cut from these, and, in specifying, the diminution due to saw-cuts must be allowed for. Other sizes are imported, but they are mostly inferior, being cut from the small wood. Odd larger sizes are cut from baulk. (2) "Specification: No. 4" (published at these offices, 5s. nett), is the best work on the subject.

Wood-Block Floors and Tile Floors.

EDINBURGH.—W. M. P. writes: "I have read with interest the answer to 'R. R.'s' enquiry about wood-block floors, on page 58 of your issue for September 4th. I should be glad of some further information on the subject. A certain corridor was covered with oak blocks laid on a bed of breeze-concrete, the faces of the blocks having been dipped in mastic and laid in position. The wood blocks had dovetailed grooves. First they shrank somewhat, then, a month or so later, swelled and rose to such an extent that the whole is rendered useless. I had some blocks taken up, and found that in places wedges had been inserted at the sides, between the blocks and the wall; that none of the grooves were filled with mastic; that the beds of the blocks were in many cases not wholly covered with mastic: and that the mastic was still quite soft. (1) Is the bed of breeze-concrete (with, I understand, a layer of asphalt below) good or bad? (2) Should the floating be watered, as recommended in 'Specification' for tiles? (3) Should the mastic or asphalt set hard? (4) Should the grooves in blocks be filled (the pattern was herring-bone)? (5) How should blocks be seasoned? (6) Is a good current of fresh air necessary (the corridor is heated with radiators)? (7) What about wedges? In another part of the house the floor tiles rose in the form of a square all round. They are 6in. by 3in. red tiles, and came clean away from the bed; the cement in the joints came off easily. Can you offer any explanation?"

We have heard of several very similar cases. The probable explanation of the one you describe is, that the blocks were not thoroughly dry, and shrunk after being laid, necessitating the use of wedges to keep them firm. The consequent swelling was doubtless due to their being wetted, probably when they were washed down or scrubbed; and the water having got in the joints they rose. It is usual to take particular care that the blocks are quite dry before being laid—in fact, they are often dried in an oven previously; but even then there is considerable danger of the blocks swelling when wetted, and this is the reason why they are usually made very small, because they stand better. From the proportion of the blocks in the sketch you send we should judge that they were too large; they should be about 18in. by 2in. by 3in. before being planed. The likelihood of wood-block flooring rising may be judged from the many patent systems of keying the blocks. The bed should have been tarred completely to prevent damp rising or getting into the concrete, which is always greedy of water and will retain it for a long time. Breeze-concrete is bad in this respect, as it is very porous. The grooves should have been very small, running a good way up the block, and filled with the mastic, which, if it had set hard when cold, would have thus keyed the blocks down. The blocks should be of well-seasoned wood, and kept in a dry place for a considerable time before laying, and further dried in an oven just previous to laying. Wedges will not then be required, and should not be used. A good current of fresh air should pass through the corridor in order to dry up any moisture, as we have noticed that where radiators are used without a free current of dry air dampness is very noticeable at times. On no account should the floating be wetted for wood-blocks; this is however a necessity in laying tiles, in order to prevent the concrete bed absorbing the water which is necessary for the setting of the cement. In laying tiles it is important to partially "kill" the cement by working it up as you would mortar. This is done to allow the heating and swelling action to pass off, which will blow the tiles; this also being the reason why similar precautions are taken in jointing drain pipes. It was this which in all probability caused the tiles in question to rise. The reason why they came away from the bed so easily was because they were not laid while the concrete bed was green, so that the fresh cement did not adhere to the old.

Classes in Masonry.

BRISTOL.—H. P. writes: "I have been asked to teach a class in masonry (ordinary grade). Kindly name a book with examination questions and answers in this subject; and also state if it is possible to get prints or sketches of fonts, pulpits, windows, &c., for students to work out in small models for workshop practice."

We do not think there is any book which contains masonry questions only. You will, of course, find numerous questions on this subject set at the South Kensington examinations given in Mitchell's and Rivington's books on building construction. You will also find many admirable drawings of constructive masonry in Viollet-le-Duc's "Dictionnaire," which could be used for working out models. "Details of Gothic Architecture," by J. K. Colling, will also be useful. Purchase's "Practical Masonry," Dobson's "Masonry and Stone-Cutting," and Siebert & Biggin's "Modern Stone-Cutting and Masonry" also have illustrations that might be worked from.

Cost of Churches and similar Buildings.

LONDON, S.W.—W. F. R. writes: "Which is the usual way to calculate the cost of churches, chapels and similar buildings? Is it computed on the cubical contents, or on the seating accommodation? Is there any book giving the cost per foot of different classes of buildings?"

Churches are roughly estimated by both methods — from 7d. to 10d. per ft. cube for plain brick or local stone, and more if ornamented. The cost usually works out between £7 to £10 per sitting. This method, of course, is merely haphazard guessing, and the proper course is to take out rough quantities of each trade. Coleman's "Price Book for Architects and Engineers" (E. & F. N. Spon, Ltd.) gives approximate estimates according to the systems of per ft. cube, per square, and per unit of accommodation.

Twisted Doors.

DUBLIN.—BUILDER'S FOREMAN writes: "Is it possible to make doors true which have become twisted? Some 2in. framed and four-panelled internal deal doors, moulded both sides, which were fitted and hung true in their frames a few years ago, are now badly 'in twist' and will not close properly."

In order to give a full answer to this question we should first require to know why the doors twisted. In most cases the twisting of a door is due to sagging of the head, thus preventing the top of the door closing; so that when the door is pressed in at the bottom, in order to get the lock to hold it, the top is bent out of the square, resulting in the door being badly twisted. We have found in many cases that if the doors are eased at the tops they gradually correct themselves. Another cause is that the mortices (now generally cut by machinery) are not in accurate alignment; the rails, when driven home, are thus slightly out of the square, and in course of time the strain set up increases the mischief. Sagging in the door itself also adds to the trouble. The only way to correct a really badly twisted door is to re-frame it with fresh rails. In slight cases the easing of the mortices and tenons and re-wedging might correct the mischief, but while this is being done new rails might as well be put in. However, as doors can now be obtained so cheaply we should think it would be the easiest way out of the difficulty to use new ones. Twisted doors are often temporarily straightened by taking them down, supporting them diagonally from corner to corner, hanging weights on the other corners, and steaming or pouring hot water over them. If possible, the doors are then hung on the other edge. After a time, however, the doors will be sure to go back to their old warped condition.

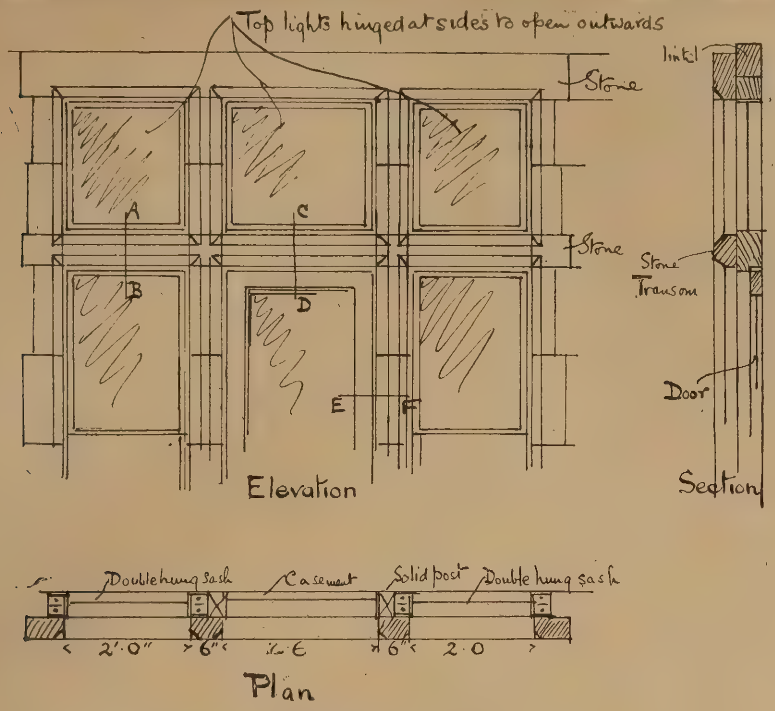
Remedying Dampness in Walls.

RICHMOND.—UNCERTAIN writes: "I have been asked to suggest a method for rendering a cellar absolutely dry. It is now very damp. I propose to excavate the ground for about a width of 4ft. round, and to the depth of footings, underpinning one part with a concrete wall, filling the space between with dry core, and relaying floor: the walls to be coated externally with asphalt ½in. thick. I also think that if I lay a land drain in the excavation, to fall to a well to be sunk about 16ft. deep, and fill up the excavation within about 3ft. from the surface of the ground, with faggots of wood, and replace the earth on top, it might act as an additional prevention. Would £60 cover the whole of the proposed works?"

The method of coating the wall outside with asphalt is the best, but we think faggots of wood would be worse than using ordinary soil; clay would be the best to fill the excavation up with. If the percolation of water is only slight, it might be stopped by cementing the wall inside, finishing off with neat cement well *trowelled*. This we have found in several cases to be effective but the wall must be cemented all round, otherwise the water will find its way to the first opening. If, however, the water comes from an underground stream being intercepted, the only remedy is to take it round the house into its old course on the other side. This can be done by laying agricultural drain pipes round; we can recommend the method from personal experience. £60 is a reasonable estimate of the cost of excavation, draining, and asphalting the outside of the walls, and this could be done in a fortnight. The walls must be thoroughly dry if they are to be asphalted. If you think the cementing of the walls inside would be sufficient, this could be done very cheaply, but we should imagine from your statement that there is a continual stream of water through the walls that an underground stream has been intercepted, and in this case the method we have suggested is the only one to overcome it.

Jobbing Clauses in Contracts.

LEICESTER.—DOUBTFUL writes: "The following clause appears in the preliminary bill of a large contract: 'Allow for each trade to attend upon all others and for jobbing work throughout the works.' Would you consider this to mean all cutting and making good holes by bricklayer, carpenter, plasterer and painter after such trades as plumber, gasfitter, electri-



WATER-TIGHT WINDOWS.

cian, specialist, whose work is included in the contract?"

Yes. The architect puts the clause in to safeguard himself, the contractor being forced in his own interest to obtain complete particulars from the architect as he goes on; otherwise, he would doubtless leave such things as gas-fittings, plumbing, &c., till the end of the job, causing numerous extras that need not occur."

Classes in Honours Building Construction.

CROYDON.—S. writes: "Kindly recommend a technical institute in London (City or South preferred) where an evening class is held in building construction, Honours, Part II., entirely separate from Honours, Part I."

We do not know of one where the subjects for Honours, Part II., are given as a special course separate from Part I. We advise you to take these subjects either at the Achitectural Association evening classes or at King's College. You could no doubt arrange to be taught only these subjects at the Polytechnic, Regent's Street, W.; the Battersea Polytechnic, Battersea Park Road, S.W.; Borough Polytechnic Institute, St. George's Circus, S.E.; or the City of London College, White Street, Moorfields, E.C.

Charges for Work not Proceeded with.

LONDON, S.W.—J. H. W. writes: "A client of mine instructed me to prepare plans, &c., for a house in the country. I did so. He then asked me to prepare another set of drawings for another house, which I also did, both of which were approved. He then gave me instructions to obtain a separate estimate for each house. A few days afterwards he stated that for the present he only intended to erect one house, and consequently signed the contract for it, with a verbal promise to the contractor that he should eventually build the second. At the same time he gave me a letter saying that he would pay me so much per cent. as architect for the one house. On several occasions I have written reminding him of his promise to build the second house, but he always avoids my question. Can I claim the usual 2½ per cent. on that house should he not build it?"

If the client has agreed to pay you according to the R.I.B.A. schedule of charges, you are entitled to 3 per cent. on the lowest estimate, *i.e.*, 2½ per cent. for plans, elevations, sections and specification, and ½ per cent. in addition for procuring tenders. If the cost would have been less than £1,000, or if special designs for furniture, fittings and decorations were entailed, you are entitled to claim more, as 2½ per cent. is not remunerative. If the Institute schedule was not agreed to by your client, you could only get at law what the court decides is a fair payment. You should make application to the client for payment, and if this is refused put the matter in the hands of your solicitor.

Water-Tight Windows.

HARRINGAY.—W. A. B. writes: "The accompanying sketch shows a three-light window. What would be the best section through A B and C D for keeping the water out above the stone transom; also horizontal section through E F.? It does not matter whether the casement opens inwards or outwards."

The accompanying illustrations show one way in which water can be kept out if the frames are properly bedded, but the sashes work out much thinner than they ought to do, and it would be better that the thickness of the stonework should be reduced to allow the sashes to be thickened to at least 1½in. Enrichments can of course be added. G. A. T. M.

"The Magazine of Art."

BRECHIN.—PERSEVERANCE writes: "Where is the 'Magazine of Art' published, and what is its price?"

It is quite absurd to write to us for such information, as it can be obtained at any railway bookstall. However, the "Magazine of Art" is published monthly by Messrs. Cassell & Co., Ltd., La Belle Sauvage, Ludgate Hill, E.C., price 1s. 4d. nett.

Surveyors' Institution Examinations.

USK.—SPRING BOW writes: "What are the subjects of common knowledge mentioned in the syllabus for the vivâ-voce Preliminary Examination of the Surveyors' Institution?"

Write to the secretary of the Institution, Great George Street, Westminster.

Bending Moment Diagrams.

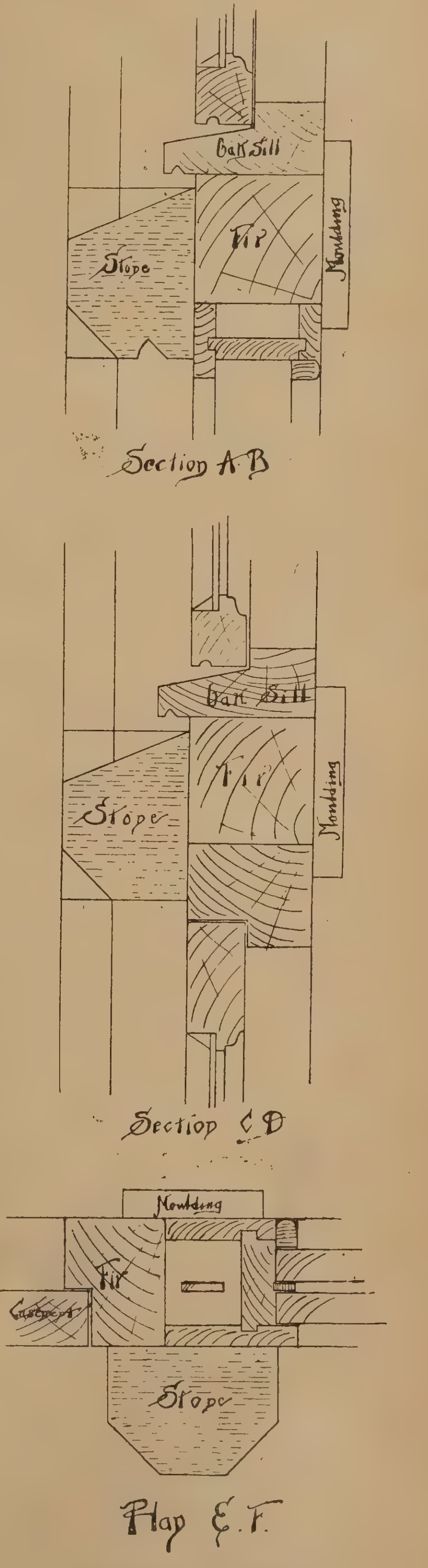
SOUTHPORT.—ACORN writes: "In working out the bending moment diagram of a beam, how is the length of pole from the line of loads determined?"

The pole is taken at any convenient distance from the load line and about opposite to its centre. The full method of procedure is explained on page 391 of our issue for December 19th last.

Green Stain for Blind Laths.

BIRMINGHAM.—A. P. J. writes: "Do you know of a green stain for outside blind laths for greenhouses that does not need varnish and will not fade? Could pine laths be stained green?"

We do not think it is possible to keep blind laths exposed to rain for long without the colour being affected, unless the surface is protected in some way so as to throw off the water. If the wood were first well soaked in boiling oil damp would not penetrate it; and the wood would not have a glossy varnished surface. The next consideration is that the colour should not fade. The following pigments are the most permanent: Chrome Green; Green Earth or Terra Verte (this is at first light in colour but darkens in time); Verdigris (this is bluish at first but turns a brighter green with age, and is much used in Russia for colouring wood roofs); Zinc or Cobalt Greens (the latter especially is per-



WATER-TIGHT WINDOWS.

manent but costly). Brunswick Greens are fairly good but turn dark in time and should not be depended upon. Copper, arsenico-copper, aniline and vegetable greens fade. The variety of Verdigris which dissolves in water might be used with a mordant. These pigments should be put on dull.

Pupils of Engineers and Municipal Surveyors.

HASLINGDON.—J. M. writes: "I desire to apprentice my son, aged 17 years, to a civil engineer and surveyor to a corporation. Can you give me particulars as to the course of study, &c., you would recommend, and the amount usually paid as premium?"

The premiums usually paid vary from £100 to £300, according to the standing of the engineer. We should advise you to communicate with several municipal surveyors who are also Associate-Members I.C.E., or Members I.C.E., and ascertain their terms. For your son to become a competent engineer and surveyor he must have had a very good education and be intelligent. The course of study would be set by the surveyor.

Masters and Men.

Swansea Building Strike.—The Swansea Master Builders' Association have, through their solicitor, written to the secretary of the men's union calling attention to the law on picketing, which, they say, will be strictly put into operation if necessary during the rest of the present strike.

The Welsh Slate Trade.—It is feared that in the immediate future the wages of the workmen employed at several of the largest quarries at the great slate centre of Festiniog will have to be reduced, owing to the accumulation of slates. One would have thought that the Bethesda dispute would have given the slate trade at Festiniog an impetus, but instead it has indirectly led to the existing depression. The unfortunate strike is more or less responsible for the introduction of American slate into this country.

The Labour Market in August.—The returns issued by the Labour Department of the Board of Trade for August show an increase in the percentage of unemployed, compared with July. Iron and steel manufactures show an improvement as against both last month and the corresponding period of last year, the total volume of employment being an increase of 0·5 per cent. and 2·5 per cent. respectively. Employment in the engineering, metal and shipbuilding trades has fallen off. In the building trades matters have continued to improve, the percentage of unemployed union members being 2·7 per cent. at the end of August, as against 3 per cent. at the end of July. In the furnishing trades employment has further declined, the percentages for August and July being 3·5 and 3·1 respectively.

The Cement Combine and Workers.—Consternation is felt by the workers in the cement trade on the banks of the Thames and Medway owing to what is believed, rightly or wrongly, to be an attempt on the part of the Cement Combination to stamp out trade unionism. Of the thirty-seven cement factories in that part of Kent twenty-eight are run by the Combination, whose employees, mostly trade unionists, number about 12,000. The village of Cliffe, which occupies an isolated situation and has a population of about 1,000, is wholly dependent on the cement industry, the only factory there, at which 227 hands are employed, being entirely controlled by the Combination. A few days ago a notice was sent by their employers to the effect that on October 10th the Cliffe factory would be closed "for repairs." The inhabitants with a dread of starvation petitioned the directors of the Combination to keep the factory open. The directors, however, in reply gave two other reasons than the one stated in the notice for closing the factory, one being that there had been insubordination on the part of two gangs of workmen, and the other, that all the Cliffe employees had decided to strike next spring. They are now, however, meeting the men in a more conciliatory spirit. Mr. Ellerman, whose recent transactions in shipping shares have attracted general attention, has secured control of the whole of the preference shares and debenture stock of the Associated Manufacturers of Portland Cement, Ltd., which remained in the hands of the founder of the company.

Strikes and Lock-out in 1900.—The Board of Trade (Labour Department) report on the strikes and lock-outs of 1900 was issued last week. Whether tested by the number of separate stoppages, by the number of workpeople they affected, or by their aggregate duration, the labour disputes of the year were considerably below the average, although in magnitude and duration they slightly exceeded those of the previous year. As in 1899, but unlike most other recent years, there was no single dispute in 1900 of such magnitude as to oveshadow all the others. Among the disputes which aroused most public attention were those affecting the Thames lightermen, the Taff Vale Railway employees, the Penrhyn quarrymen and the Staffordshire pottery workers. Altogether 648 disputes were recorded involving 188,538 persons, and the aggregate duration in 1900 of all disputes in progress was 3,152,694 working days. Thus the strikes and lock-outs of 1900 involved about 2·2 per cent. of the industrial population, and caused an average loss per head of less than half a day's work in the year. The results of the disputes as recorded were, on the whole, somewhat more favourable to the workpeople than in most recent years. Trade was generally good throughout the year, and wages continued to have an upward tendency. but in cases in which stoppages were resorted to the operatives had greater difficulty than in the previous year in securing compliance with their demands. An analysis of the causes of disputes shows that as usual questions of remuneration were the most frequent.

Engineering Notes.

The Shire Hall, Haverfordwest, has been fitted with the latest improved low-pressure hot water heating apparatus by Messrs. John King, Ltd., engineers, Liverpool, who have employed their Rahnee radiators.

New Bridge at Monquhitter.—The new bridge just completed over the Turriff Burn at Mill of Pott was formally opened for traffic last week. Mr. Ferguson, of Bogtama, Fyvie, was the contractor. The new bridge is a substantial structure of one span, in which massive metal girders, surmounted by a neat ornamental railing, are used in spanning the stream. The remaining masonry and piers are composed of strong dressed sandstone, ashlar work throughout, resting on concrete foundations. As already stated, Mr. Ferguson, Fyvie, carried out the mason-work. The iron-work was entrusted to Messrs. Abernethy & Co., Aberdeen; while Messrs. James Duncan & Son, architects, Turriff, were inspectors of works.

Electrical Illuminations in France for the Czar's Visit.—The whole of the official electrical illuminations at the Compiègne were done on the E.L.B. System of Electric Lighting Boards, Ltd., to the exclusion of all other electrical work, the illumination devices alone carrying 12,000 lamps, whilst no less than 500 garlands of lights were also provided, and further, 3,000 yds. of illuminated festoons. The whole of the official electrical illuminations on the Prefecture buildings and the Town Hall at Dunkirk were done on the E.L.B. system, the illumination devices alone carrying 3,000 lamps. The Transatlantic liner, "La Gascogne" was lit up on the E.L.B. system as well as one of the cruisers of the French fleet, the latter as an experiment for future illumination of the French men-of-war. At Paris inumerable decorative schemes were carried out for business firms on this system, but the most interesting was a design at the "Orangery" involving 4,000 lamps.

The Draining of the Zuiderzee is the subject of a recent report by Sir H. Howard, the British Minister for the Netherlands. A Bill relating to this project was introduced in the Second Chamber of the States General. The plan really consists of first enclosing, and afterwards gradually partially reclaiming, the Zuiderzee, the pumping out of the water to be effected by steam pumps. The first work will be the construction of a dam from Wieringen, in North Holland, to Piaam, in Friesland. This dam will have sluices into the North Sea. The next works will be the creation of two polders, or areas of dry land reclaimed from the Zuiderzee; the first, between Wieringen and Medemblik, to be called the "North-West," and the second, between Hoorn and Marken. to be called the "South-West." The rest will remain a fresh-water lake, but should the plan prove successful, in days to come two more polders on the North-east and South-east of the lake may be created. The two polders will be of the following areas, viz.: The North-west polder, 21,700 hectares, containing 18,700 hectares of fertile land; and the South-west Polder, 31,520 hectares, containing 27,820 hectares of fertile land. The entire work is to be completed in eighteen years. The inclosing dyke from Wieringen to Piaam will be finished in the ninth year. In the eighth year will be commenced the work for dyking the north-west Polder, which in the fourteenth year will be dry and ready for sale. In the eleventh year the similar works on the south-west Polder will be begun, and will be completed in the eighteenth year, when an area of upwards of 46,500 hectares of fertile soil will have been reclaimed. The cost of this gigantic work is estimated in round numbers at 95,000,000fl. (£7,916,667).

Trade and Craft.

Builders' Hardware.

Mr. Howard W. Meredith's new catalogue of builders' hardware is a bulky production of 300 pages, very fully illustrated. Such a catalogue hardly calls for much comment as the majority of the goods are those which form the stock-in-trade of every builders' merchant. The numerous chimney-pieces and mantel-registers shown include a few new designs, some of them comparatively good, others thoroughly bad; for example, "The Oxford" chimney-piece is simple and satisfactory, while the wood overmantel No. 208, with its graceless pediment, brackets and elaborately-turned pillars, is altogether unsightly. In the same way the cast-iron mantel-register No. 1804, showing the "Arts and Crafts" principles adopted commercially, is pleasing just as the ostentatious iron chimney-piece No. 2056, with overmantel and mirrors, offends all good taste. Tiles, gates, railings and gas fittings are similarly "showy." The catalogue is an ordinary builders' merchant's catalogue, and as such it is a very comprehensive one; but we can say no more of it. Mr. Meredith's showrooms are at 68, York Road, opposite Waterloo Station.

"Continuous" Filtration of Sewage.

The "York" compensation filter which has been erected at the sewage disposal works at York by Messrs. The Adams Patent Sewage Lift Co. (works are at York, London offices at 7, Old Queen Street, Westminster) has been in constant operation for slightly more than a year, and it is believed that filters fitted with this apparatus will deal with a volume many times in excess of that which under other circumstances would be possible, and that consequently smaller disposal works are required. This is largely due to the distributor, which during normal flow delivers the liquid spray (ordinarily) from one pair of arms alone. At times of increased flow the excess liquid rising to the level of other arms is distributed by these. The number of arms in work is thus dependent upon the flow. The apparatus adjusts itself to the volume and deals with rather than rejects an increase, a feature of extreme importance. The drenching out of the filter is accomplished automatically. The radial arms depend for their velocity of travel upon the head of liquid and angle of delivery; the depression of the latter reduces the number of revolutions made in a given time, with the result that, the duration of discharge over the entire surface being lengthened, the amount of liquid poured out upon the filter is sufficiently great to wash out any deposit which may have accumulated. To cleanse such a filter by hand is difficult and unsatisfactory. The same operation performed automatically is simple and thoroughly satisfactorily. The apparatus will work under a head of from 6in. upwards, and is made of varying types for varying needs.

Chimney-Pieces.

Messrs. Graham & Banks, Ltd., of 445, Oxford Street, W., have prepared five new catalogues dealing respectively with furniture, chimney-pieces, parquet flooring, sofas and chairs, and wall pannellings. Judging from the catalogue of chimney-pieces and grates which has been sent us, we can thoroughly recommend architects and builders to pay a visit to this firm's showrooms. We are unfortunately too familar with the chimney-pieces of the Victorian era—they still confront us in the majority of houses, and their cut pediments, senseless incision carving and miserable turned pillars make us wonder how people can continue to buy such things. Happily, however, we have come out of that abyss of design, and in the fuller light we have seen a slow but sure improvement taking place, though we are yet far from being free of the worthless creations to which we have referred. From profusion of ornament a reversion was made to nullity of ornament, kitchen severity forming the keynote for the new design. "Half a loaf is better than no bread" is certainly a wise proverb for a workaday world, but it does not apply to decoration, for it is better to have no ornament than bad ornament. In Messrs. Graham & Banks' catalogue there are several designs which show a restraint which is only too often absent; for instance, the chimney-pieces illustrated on the first few pages of the catalogue are straight-forward and constructively good, the ornament being restricted to certain portions. Plain tiles are combined with the wood in a most pleasing manner, and the ironwork is simply treated; moreover, the prices are moderate. These chimney-pieces are made in primed pine and fumed oak. Numerous other designs are shown in the catalogue, including a copy of an English eighteenth-century chimney-piece, and one in the Adams style; in fact, the firm appear to make a speciality of replicas of old designs, having thus made use of the fireplace and oak pannelling removed from one of the upper rooms of the "Old Palace" at Bromley-by-Bow (built in 1606), and two carved oak overmantels taken from a house in Lime Street, City (date about 1620). The catalogues are excellently produced, the illustrations being well printed.

Sanitary Specialities.

We have already referred on more than one occasion to the great revolution that has been effected in manufacturers' catalogues, which from miserable productions on flimsy paper have become splendid specimens of the printer's art, printed on the best paper and illustrated with photographic reproductions of the various articles. Such a catalogue is that of Messrs. Farrer, Barber & Co., engineers and sanitary specialists, of 36, Cannon Street, Birmingham. The automatic flushing closets shown include open troughs, latrines with bottom pans and risers, and auto-multi closets, the example illustrated having three pedestal closets side by side attached to one flushing tank. (The system of multiple closet has proved very successful where it is necessary for closets, though combined in ranges for flushing purposes, to be each isolated as far as possible.) Various syphon-flushing cisterns and closet seats are illustrated in the catalogue, and among the pedestal closets we notice especially the "Special," the "Coburg" and the "Acanthus." The design of these closets is very satisfactory. Several of the lavatory basins are less pleasing, but the simple lavatory and pedestal of heavy glazed white fireclay, with rounded edges (No. 223), and the "simplex shaped" lavatory basins, are excellent. Baths and their fittings, sinks, urinals, manhole fittings and other sanitary appliances are also shown, the majority of them being carefully designed. The catalogue should be consulted by all architects. We have never seen one better produced.

Euboeolith Patent Flooring.

Messrs. Zboril Miksch & Co., of Vienna, have transferred to Mr. Emil Sequin the exclusive right of using their patent "Xylolith" flooring, which has been registered as "Euboeolith." It is a chemical combination of inorganic bodies with other suitable material, and hardens in a very short time to a bonelike substance. It combines the elasticity of wood with the hardness and solidity of stone, and is antiseptic, fireproof and watertight. It is not affected either by cold, heat or damp air, nor by diluted acids, alkalis or oils. "Euboeolith" can be coloured in bulk and keeps the same colour even after long use. It is laid without any joints and can be put on underfloors of concrete, stone or bricks. A block of "Euboeolith" was tested in contact with a grindstone having a sandy surface and making 2,000 revolutions per hour. After two hours' treatment the block showed 0·299in. wear. Two blocks of "Euboeolith" were immersed in water for twenty-four hours. The weight of water absorbed was: first piece 12·9 per cent.; second piece 12·3 per cent. Blocks showed no effect whatever after being frozen to 4 degs. below zero Fahrenheit. The flooring is largely used on the Continent and is specially suitable for cotton and spinning mill floors, warehouses, public buildings, hospitals, &c., and should find a ready market in this country. It is intended solely as a finished surface to an ordinary fireproof floor of concrete or other material, no wood being used underneath, and when laid is noiseless to walk on. Mr. Sequin's offices are at 3, Victoria Street, Westminster, S.W.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BOSTON (LINCS.).—For the erection of cookery centre, pupil teachers' centre, and evening science classes, for the Boston School Board. Mr. James Rowell, M.S.A., architect, Boston, Lincs. Quantities by Mr. W. Hoffman Wood, 14 Park Square, Leeds:—

A Contractor at Peterborough	£2,858
Other Contractors of Boston	2,193 2,150 2,110 2,095 1,960
H. D. Parker & Son*	1,929

[Rest of Boston.] * Accepted.

BOSTON (LINCS.).—For the erection of workshops for Messrs. Holland Bros., cycle makers, Boston. Mr. James Rowell, M.S.A., architect, Boston, Lincs.:—

Wm. Greenfield	£536 10	T. H. Cade	£495 0
J. W. Darby	525 0	J. Lucas*	480 0
C. Jessop	500 0		

* Accepted. [All of Boston.]

BURTON-ON-TRENT.—For the erection of shops, Church Gresley, Burton-on-Trent, for Messrs. Hunters, the "Teamen," Ltd., Hyde Road Works, Manchester. Mr. C. F. Underhill, architect, Burton-on-Trent and Swadlincote:—

W. Ward	£1,976 0	R. Kershaw	£1,699 10
C. Venning	1,800 10	E. Clarke*	1,680 0

* Accepted.

DUDLEY.—Accepted for supply and erection of the following plant, for the Electric Light and Tramways Committee: (Section B) Part I., steam-engine; Part II., dynamo:—

Ferranti, Ltd., Manchester, engine	£3,145
Electric Construction Company, Ltd., Wolverhampton, dynamo	1,969

DARLINGTON.—For the erection of 11 dwelling-houses in Woodlands Terrace, Darlington, for Mr. William Waterson. Mr. Frank Martin, architect, South End Chambers, Darlington:—

Johnson & Boyd, Thomas Street	£4,422 0
J. Jenkins, Commercial Street	3,963 10
Boyd & Sons, Mechanics' Yard	3,835 0
Veitch & Johnson,* Crown Street	3,723 0

NOTE.—Remainder all separate tenders. [All of Darlington.]
* Accepted.

EAST DEREHAM (NORFOLK).—For the erection of a pair of cottages, for the Trustees of the late Mr. J. Montague. Messrs. W. Jarvis & Son, architects, King's Lynn:—

J. W. Fisher, Fakenham	£590 0 0
Hubbard, Moody & Co., Dereham	569 0 0
G. Jeffries, Swaffham	569 0 0
Jos. Springhall, Swanton Morley	568 0 0
Chas. Smith, East Dereham	557 6 2
W. J. Larner, East Dereham	520 0 0
Horace Mack,* East Dereham	487 3 2

* Accepted.

ETTINGSHALL.—For the erection of residence, stabling, &c. Mr. S. H. Eachus, architect, Temple Chambers, Wolverhampton. Quantities by the architect:—

Residence.

L. Jones	£1,750	Willcock	£1,595
T. Skett	1,700	Ham	1,561
J. Herbert	1,625	Cave	1,557

[All of Wolverhampton.]

Drains.

Ham	£52 0	L. Jones	£44 4
T. Skett	50 0	Cave	42 0
Willcock	48 0	J. Herbert	39 0

Fence.

L. Jones	£172 0	Ham	£146 2
J. Herbert	149 0	Cave	142 0
Willcock	147 10	T. Skett	135 0

Stabling.

L. Jones	£278 0	Willcock	£248 10
Ham	257 0	J. Herbert	236 0
T. Skett	250 0	Cave	233 0

Facing.

Willcock	£65 0	T. Skett	£54 0
Cave	56 0	J. Herbert	49 0
L. Jones	56 0	Ham	46 18

GRAVESEND.—For the erection and completion of the proposed electric lighting and destructor buildings and chimney shaft near the canal basin, Gravesend, for the Town Council:—

J. Shelbourne & Co., 70, Fenchurch Street	£8,342 0 0
J. E. Johnson & Son, Leicester	8,237 0 0
Beal & Hubbard, Gravesend	8,176 18 6
J. Smith & Son, Norwood Junction	8,175 0 0
F. G. Minter, Westminster	8,030 0 0
J. Lonsdale, Swanley Junction	7,887 0 0
Thomas & Edge, Woolwich	7,697 0 0
G. E. Wallis & Son, Maidstone	7,557 0 0
Hughes & Stirling, Arundel Street, Strand	7,553 0 0
Multon & Wallis, Gravesend	7,533 0 0
F. & E. Davey,* Southend-on-Sea	7,094 0 0

Chimney shaft and foundation only.

Blackburn, Nottingham	£1,375 0 0

* Accepted.

HALIFAX.—For the erection of chimney shaft, 60 yards high, at the electricity works, Foundry Street, for the Tramways and Electricity Committee. Mr. James Lord, C.E., borough engineer:—

J. Charnock & Sons, Halifax	£3,489 12 0
Dean, Hetherington & Co., Leek, Staffordshire	2,930 0 0
Bower Bros., Halifax	2,523 5 10
Dryland & Preston, Littleborough	2,288 0 0
Myles & Warner, Stalybridge	2,217 8 8
H. Jenkinson & Sons,* 360, Queen's Road, Halifax	1,901 11 3
T. Mitchell, Hoyle Green, Warley Town	1,898 4 6

* Accepted.

HALIFAX.—Accepted for the erection of two new shops, &c. at West Vale. Messrs. Walsh & Nicholas, architects, Halifax:—
Mason, Drinkwater and Schofield.
Joiner, Mr. Thompson.
Slater and Plasterer, D. Wadsworth.
Plumber, J. Riley.

KING'S LYNN.—For alterations and additions to residence for Mr. J. I. Dennick. Messrs. W. Jarvis & Son, architects, King's Lynn:—

J. Medwell	£197 10
R. Dye	185 0
W. H. Brown	181 0
Tash, Langley & Co.*	156 10

* Accepted. [All of Lynn.]

KING'S LYNN.—For the restoration of Brush Factory after fire, for Mr. T. Adams. Messrs. W. Jarvis & Son, architects, King's Lynn:—

J. Medwell	£85 10
Tash, Langley & Co.	76 14
A. F. Foreman*	67 10

* Accepted. [All of Lynn.]

LINCOLN.—For the various works comprised in building the proposed public abattoirs in the Cattle Market, for the Markets Committee. Mr. R. A. Macbrair, city surveyor:—

W. Pattinson & Sons, Ruskington	£6,733 0
W. & M. Halkes	6,691 0
H. S. & W. Close	6 680 0
Halkes Bros.	6,619 0
W. Wright & Son	6,101 0
Lincoln Co-operative Society, Ltd.*	6,050 19

* Accepted. [Rest of Lincoln.]

LUTON.—For stabling, workshops, van sheds, &c., at rear of Nos. 8 and 10, Manchester Street, for Mr. T. Sworder. Mr. A. Wilkinson, architect, 84, Inkerman Street, Luton:—

Cain & Co.	£1,875 12	T. & E. Neville	£961 0
G. Kingham	1,353 0	A. D. Batson	960 0
D. Parkins	1,107 0	G. W. Pryer	960 0
Godfrey & Rumbles	1,042 0	Turner	947 10
Mallet & Wood	1,002 0	G. Smart	929 0
J. Tomkins	1,000 0	Taylor	827 18
G. Buckingham	964 0	A. Mardle*	826 6

* Accepted. [All of Luton.]

NEW BROMPTON.—For the erection of school buildings for 1,230 children, to be known as the Richmond Road Schools, for the Gillingham and Grange U.D. School Board. Mr. H. Dighton Pearson, A.R.I.B.A., architect, 27 Chancery Lane, London, W.C. Quantities by Messrs. Leaning & Sons:—

J. Chessum & Sons, London	£15,074 0
Leslie & Co., London	14,358 0
Henry Flint, High Wycombe	14,283 8
Charles Wall, London	14,160 0
W. C. Snow, New Brompton	13,573 18
F. G. Minter, London	13,271 0
Walter Wallis, London	13,191 0
Kirk & Kirk, London	12,736 2
G. E. D. Woollard, New Brompton	12,570 0
Executors of T. F. Barden, Maidstone	12,545 0
West Bros., Rochester	22,529 0
Wallis & Sons, Maidstone	12,385 0
H. E. Phillips, New Brompton	11,962 0
R. L. Tonge, Watford	11,730 0
Geo. Gates,* Rochester	10,800 0

* Accepted.

SNETTISHAM (NORFOLK).—For alterations and additions to shop and premises at Snettisham, for Messrs. Lambert & Sons. Messrs. W. Jarvis & Son, architects, King's Lynn:—

Robert Dye	£649 0 0
W. H. Brown	607 0 0
Tash, Langley & Co.	606 13 6
J. Chilvers, Snettisham	554 0 0
G. Chambers & Sons,* Snettisham	500 0 0

* Accepted. [Rest of Lynn.]

SOUTHBOROUGH (KENT).—For the erection of a chapel and cottage, in connection with the proposed new cemetery at Southborough, for the Southborough Burial Board. Mr. William Harmer, surveyor, 137, London Road, Southborough:—

H. Whibley, Southborough	£1,900 10 0
C. J. Gallard, Southborough	1,492 0 0
Gann & Co., Whitstable	1,380 0 0
Martin & Co., Tonbridge	1,300 0 0
H. C. Jarvis, Tonbridge	1,240 0 0
Tapener & Co., Hastings	1,235 0 0
J. Leney & Son, Tunbridge Wells	1,228 0 0
Beale & Son, Tunbridge Wells	1,220 0 0
J. Marshall, Tunbridge Wells	1,205 0 0
J. Crates & Son, Tunbridge Wells	1,179 0 0
E. Funnett & Son, Tonbridge	1,175 0 0
T. Potter,* Southborough	1,172 [illegible] 10

* Accepted.

TRURO.—For the erection of a new cattle market. Mr. M. Lea, city surveyor and engineer:—

A. N. Coles, Plymouth	£6,389
H. E. Skinner, Plymouth	5,896
W. E. Beake, Plymouth	5,598
J. Colliver,* Truro	5,179
J. Harris, Truro	5,097

* Accepted. [City engineer and surveyor's estimate, £5,212.]

WALTON-ON-THAMES.—For the erection of stables, cart sheds, cottage, and other buildings at their depôt site in Crutchfield Lane, Walton-on-Thames, for the Walton-on-Thames Urban District Council. Mr. Charles J. Jenkin, A.M.I.C.E., engineer and surveyor:—

J. Lee, Rock Place, Godalming	£2,894
Newland & Higgs, Cobham, Surrey	2,799
W. Greenfield, Weybridge	2,606
Simpson & Co., Walton-on-Thames	2,571
Shelbourne & Co., Fenchurch Street, London	2,563
T. T. Hawkins & Co., Ashford, Middlesex	2,493
R. Atkinson, Kingston-on-Thames	2,480
Merredew & Co., Kingston-on-Thames	2,450
W. H. Gaze & Sons, Walton-on-Thames	2,359
Redhill Joinery Company, Redhill	2,250
C. Horsell,* Weybridge	2,147

* Accepted.

WEYMOUTH.—For the extension of the cast-iron outfall sewer at the Nothe Point for a distance of about 1,000 ft. to sea, and other works in connection therewith, for the Corporation. Mr. W. Barlow Morgan, borough engineer and surveyor:—

G. Bowring, St. Thomas Street, Weymouth	£3,996 0 0
J. T. Whettam, Grange Road, Weymouth	3,600 0 0
Cooke & Co., 16 Victoria Street, Westminster, London, S.W.	3,450 0 0
J. A. Bartlett,* Franchise Street, Weymouth	2,582 10 6

* Accepted.

WHITCHURCH (SHROPSHIRE).—For the erection of a new residence, Tilstock, Whitchurch, Shropshire, for Mr. W. C. Roscoe. Mr. J. Harry Pickard, architect, Whitchurch:—

R. Powell	£1,792	G. Dodd	£1,585
J. Pickard	1,675	G. Edge,* Whitchurch	1,547
J. Corfield	1,597	* Accepted, as modified.	

WOOLWICH.—For supplying and erecting wrought-iron fencing gates, brick piers, and boundary walls, &c., to their site, Lodge Lane, Bostall Heath, Plumstead, for the Guardians of Woolwich Union. Messrs. Church, Quick & Whincop, architects, William Street, Woolwich:—

Stephens & Son, Woolwich	£3,150
J. Chapman, Liverpool Road, N.	2,958
Pollard & Brand, South Tottenham	2,800
E. Proctor, Woolwich	2,730
Thomas & Edge, Woolwich	2,700

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Sept.	27	Kildwick—Restoration of Church	—	Wright & Son, Surveyors, Lancaster.
"	27	Pellon, Halifax—Fourteen Houses, &c.	—	M. Hall, 29 Northgate, Halifax.
"	27	Whitstable, Kent—Coastguard Buildings	Admiralty	Director of Works Department, Admiralty, 21 Northumberland Avenue, W.C.
"	27	Wainfelin, Wales—Cottages	—	P. Chapman, Wainfelin.
"	28	Blackpool—Additions to Destructor Works	Cleansing Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
"	28	Castleisland, Ireland—Tower and Spire of R.C. Church	—	D. J. Coakley, Architect, Cork.
"	28	Leicester—Competitors' Room	Baths Committee	Borough Surveyor's Office, Town Hall, Leicester.
"	28	Pelsalt, Staffs—Alterations, &c. to Church	—	T. H. Fleeming, 102 Darlington Street, Wolverhampton.
"	30	Bristol—Infants' School and Class Centre	School Board	P. Munro & Son, 6 St. Stephen's Chambers, Baldwin Street, Bristol.
"	30	Glasgow—Reconstruction of Buildings	Caledonian Railway Company	J. Miller, 15 Blythswood Square, Glasgow.
"	30	Hornsea, Yorks—Cemetery Fencing	Urban District Council	W. G. Warburton, Surveyor, Public Rooms, Hornsea.
"	30	Hounslow—Twenty-two Workmen's Houses	Urban District Council	P. G. Parkman, Engineer to Council, Town Hall, Hounslow.
"	30	Menston, Yorks—Isolation Hospital	—	C. V. Newstead, Clerk, Union Offices, Otley.
"	30	Carlisle—Houses	—	Messrs. Briggs Brothers, Market Street, Carlisle.
"	30	Leeds—Club Premises	East Ward Unionist Association	Thomas Winn & Sons, 92 Albion Street, Leeds.
"	30	Machynlleth, Wales—Schools	School Board	— Davis-Williams, Clerk, Machynlleth.
"	30	Stafford—Shop Superstructure	Siemens Brothers & Co.	Siemens Brothers & Co., Woolwich, Kent.
"	30	Wombwell, Yorks—Houses, &c.	—	J. Robinson, Park Cottage, Wombwell.
"	30	Swadlincote—Boundary Wall	Urban District Council	T. Kidd, Surveyor, Swadlincote.
"	30	Gateshead—Additions to Offices	County Council	J. Bower, Borough Surveyor, Gateshead.
"	30	London, N.E.—Institute	Governors	A. W. Cooksey, 4 Adam Street, Adelphi, W.C.
"	30	Gateshead-on-Tyne—Extensions to the Wire Rope Factory.	—	Marshall & Tweedy, 4 Northumberland Street, Newcastle-on-Tyne.
"	30	Rhymney—New Hotel	—	Queen Victoria Hotel, Rhymney.
"	30	St. Fillans—Stationmaster's House	Directors of Railway	Crouch & Hogg, 53 Bothwell Street, Glasgow.
Oct.	1	Colchester—New Laundry	Lexden and Winstree Union	G. H. Page, Trinity Chambers, Colchester.
"	1	Braintree—Two Gables, &c.	Urban District Council	Surveyor's Office, Vestry Hall, Braintree.
"	1	Abercarn—Chapel, &c.	Urban District Council	G. Stevens, Surveyor, Council Offices, Abercarn.
"	1	Alfreton—Boiler House	Urban District Council	E. Houfton, Surveyor, Hine Street, Alfreton.
"	1	Wellington, Salop—16 Workmen's Dwellings	Urban District Council	J. W. Littlewood, 45 Walker Street, Wellington.
"	1	Carrickfergus, Ireland—Repairs to Houses	Governors of Shiels's Institution	Superintendent, Shiels's Institution, Carrickfergus.
"	1	Great Yarmouth—Cemetery Chapel, &c.	Town Council	J. W. Cockrill, Borough Surveyor, Town Hall, Great Yarmouth.
"	1	Windsor—Workshops, &c.	Royal Gaslight Co.	Gas Offices, Windsor.
"	1	Stanway, Essex—Laundry	Guardians	J. H. Page, Trinity Chambers, Colchester.
"	1	Plymouth—Schools	School Board	H. J. Snell, 11 The Crescent, Plymouth.
"	1	Camborne, Cornwall—House	J. F. Pearce	J. F. Pearce, Camborne.
"	1	Brighton—Re-roofing a Covered Way	Guardians of the Poor	H. S. Reed, Parochial Offices, Brighton.
"	2	Brynmawr, Wales—School	School Board	F. Baldwin, 13 Frogmore Street, Abergavenny.
"	2	Glasgow—Additions, &c.	Parish Council	MacWhannel & Rogerson, 59 West Regent Street, Glasgow.
"	2	Rushden, Northants—Fire Station, &c.	Urban District Council	W. B. Madin, Town Surveyor, Vestry Hall, Rushden.
"	2	Swindon—Electricity Buildings	Corporation	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster.
"	2	Weston-super-Mare—Walls	School Board	H. F. Price, Surveyor to the Board, Weston-super-Mare.
"	2	Toxteth Park—Alterations	Guardians	W. W. Thomas, 13 Lord Street, Liverpool.
"	2	Hornchurch—Schools	School Board	S. J. Adams, Weston Chambers, Weston Road, Southend.
"	2	Hessle, near Hull—Pumping Station	North-Eastern Railway	Station Master, Paragon Station, Hull.
"	3	Bray, Ireland—Bricks, &c.	Urban District Council	P. MacDonnell, Clerk, Town Hall, Bray.
"	4	Bexhill—Coastguard Buildings	—	Director of Works Department, Admiralty.
"	5	Thornaby, Yorks—Additions, &c.	Police Station	County Surveyor's Office, Northallerton.
"	5	Carrickfergus—Wall, &c.	Urban District Council	W. D. R. Taggart, 17A Donegall Street, Belfast.
"	5	Hillsborough—Manse	Committee of Presbyterian Church	S. Stevenson, 83 Royal Avenue, Belfast.
"	7	Cheadle, Cheshire—Mortuary Buildings	Urban District Council	G. H. Brady, 18 Little Underbank, Stockport.
"	7	Belfast—Two Semi-detached Villas	—	T. Houston, Architect, King's Court, Wellington Place, Belfast.
"	8	London, S.W.—Dwellings	London County Council	Architect's Department, 18 Pall Mall East, S.W.
"	8	Oldham—Generating Station	Electricity Committee	A. Andrew, Gas and Water Offices, Oldham.
"	8	Selly Oak, near Birmingham—Wards, &c.	Guardians of Union	Mansell & Mansell, Quantity Surveyors, Colmore Row, Birmingham.
"	8	Bridlington—Central Schools & Caretaker's Residence	United District School Board	J. Earnshaw, Architect, Bridlington.
"	8	Sheffield—Public Baths and Library	Corporation	C. F. White, City Surveyor, Town Hall, Sheffield.
"	8	Tooting, S.W.—276 Cottage Dwellings	London County Council	Housing Branch of Architect's Department, 18 Pall Mall East, S.W.
"	8	King's Norton—Wards, Lodge, Pavilion, &c.	Union Guardians	Mansell & Mansell, Quantity Surveyors, Colmore Row, Birmingham.
"	8	St. Annes-on-the-Sea—Warehouse, Offices, &c.	Directors of Railways	Engineer's Office, Hunt's Bank, Manchester.
"	9	Barking, Essex—Lodge, &c.	Urban District Council	C. F. Dawson, Council's Surveyor, Public Offices, Barking.
"	10	Pontypool—Hospital	—	R. Williams, 10 Clifford Inn, Fleet Street, E.C.
"	10	Winlaton—Houses and Boundary Wall	School Board	Liddle & Browne, Prudential Bdgs., Mosley St., Newcastle-on-Tyne.
"	12	Devizes, Wilts—Visiting-room at Asylum	County Council	C. S. Adye, County Surveyor, County Offices, Trowbridge.
"	12	Cheltenham—Town Hall	Corporation	E. T. Brydges, Town Clerk, Municipal Offices, Cheltenham.
"	15	London, S.E.—Receiving Ward at Workhouse	Lambeth Parish Guardians	Fowler & Hugman, 9 Craig's Court, Charing Cross, S.W.
"	15	Braintree—Cattle Market	Urban District Council	F. Whitmore, Architect, Chelmsford.
Nov.	1	Navan, co. Meath—Alterations, &c. to Convent	—	Loretto Convent, Navan, co. Meath.
		ENGINEERING:		
Sept.	27	Conway—Water Main	General Purposes Committee	Borough Engineer, Town Hall, Conway.
"	27	Doncaster—Dynamo	Corporation	C. A. L. Prusmann, Electricity Works, Grey Friars Rd., Doncaster.
"	27	Hull—Dynamos, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
"	28	Swansea—Steam Road-roller	Rural District Council	G. B. Haynes, Clerk, Alexandra Road, Swansea.
"	28	Wilmslow—Enlarging Tank	Urban District Council	A. S. Cartwright, Council Offices, Wilmslow.
"	28	Lutterworth—Sewage Outfall, &c., Works	Rural District Council	W. H. Simpson, Civil Engineer, The Corridor Chambers, Market Place, Leicester.
"	28	Reading—Tramways	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
"	30	Rio de Janeiro—Docks	Brazilian Minister of Industry and Public Works.	Commercial Department, Foreign Office, S.W.
"	30	Listowel—Electric Lighting Scheme	Urban District Council	E. J. Gleeson, Clerk, Listowel.
"	30	Sheffield—Electric Plant	Corporation	S. E. Fedden, General Manager, Commercial Street, Sheffield.
"	30	London, S.E.—Paving, Flag-making Plant	Bermondsey Borough Council	Engineer, Town Hall, Spa Road, Bermondsey.
"	30	West Tarring, Sussex—Water Main	E. Preston Rural District Council	Council's Office, Littlehampton.
"	30	Sandal Magna, near Wakefield—Pipes, &c.	Urban District Council	F. Massie, Council Offices, Sandal.
"	30	Ilfracombe—Sinking Shaft	Urban District Council	Engineer's Office, Town Hall, Ilfracombe.
"	30	Edinburgh—Waterworks	District Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
"	30	Edinburgh—Settling Ponds	District Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
"	30	Bombay—Oil Engines, &c.	Municipality Drainage	J. Taylor & Sons, 27 Great George Street, Westminster, S.W.
"	30	Huddersfield—Generating Plant	Corporation	Town Clerk's Office, Town Hall, Huddersfield.
Oct.	1	Hadsund, Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes Kŏntor, Reventlowsgade, 10 Copenhagen, B.
"	1	Leicester—Pumping Machinery	Corporation	E. G. Mawbey, Borough Engineer & Surveyor, Town Hall, Leicester.
"	1	Banff—Water and Drainage Works	District Committee	J. Barron, 1 Bon Accord Street, Aberdeen.
"	1	Bradford-on-Avon—Pipe Sewers	Urban District Council	S. Howard, Surveyor, Town Hall, Bradford-on-Avon.
"	1	Aldershot—Excavating, &c.	Urban District Council	Surveyor to the Council, 126 Victoria Road, Aldershot.
"	1	London, E.—Electric Lighting	Poplar Borough Council	Borough Electrical Engineer, Electricity Works, Glaucus Street, Bromley-by-Bow, E.
"	1	India Office, S.W.—Wheels and Axes, Switches, &c.	—	Director-General of Stores, India Office, Whitehall, S.W.
"	2	Enfield, Middlesex—Well, &c.	Urban District Council	R. Collins, Surveyor, Enfield.
"	2	Rochdale—Cables	Electricity Committee	C. C. Aitchison, Borough Electrical Engineer, Electricity Works, Dane Street, Rochdale.
"	2	Christiania—Turntables	Norwegian State Railways Department	Commercial Department, Foreign Office, S.W.
"	2	Littlehampton—Pumping Plant	Urban District Council	W. Howard, Engineer, Town Offices, Littlehampton.
"	3	Stromness—Pier and Stores	Northern Lighthouses Commissioners	D. A. Stephenson, Engineer to the Commissioners, Edinburgh.
"	3	Blackmill, near Bridgend—Steelwork	Ogmore and Garw Urban District Council.	H. D. Williams, Civil Engineer, Blackmill.
"	3	Ilkeston—Pumping Main	Water Board	G. and F. W. Hodson, Engineers, Loughborough.
"	5	Monaghan—Waterworks	Urban District Council	J. L. Devenish-Meares, Town Hall, Newry.
"	5	Bideford—Sewers, Water Main, &c.	Corporation	B. Lasham, Parliament Mansions, Victoria Street, Westminster.
"	7	Londonderry—Waterworks	Council	J. J. S. Barnhill, 1A Strand, Londonderry.
"	8	Leeds—Switchboard	Lighting Committee	H. Dickinson, 1 Whitehall Road, Leeds.
"	8	London, S.W.—Electric Lifts, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
"	8	London, S.W.—Tramways	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
"	8	London, S.W.—Continuous Current Plant	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
"	10	Greenwich—Engineering Works	Guardians	T. Dinwiddy, 12 Crooms Hill, Greenwich, S.E.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		IRON AND STEEL:		
Sept.	30	Nottingham—Rails, &c.	City Council	A. Brown, City Engineer, Nottingham.
Oct.	1	Alexandria, Egypt—Mooring Chains	Administration of Ports and Lighthouses	Controller-General of Ports and Lighthouses, Alexandria.
"	3	Salford—Girders, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Office, Bloom Street, Salford.
Nov.	11	London, S.W.—Rails, &c.	——	Agent-General for Victoria, 15 Victoria Street, London.
		PAINTING AND PLUMBING:		
Sept.	27	Stockbridge—Painting	Co-operative Society	Society's Offices, Stockbridge.
"	28	Bakewell—Painting	Guardians	A. Hawes, Clerk, Union Offices, Bakewell.
"	30	Preston—Painting	Burial Board	Myres, Veeves & Myres, 15 Chapel Street, Preston.
Oct.	14	Knutsford—Painting and Limewashing	Bucklow Union Guardians	R. J. McBeatt, Architect, Birnam House, Sale.
		ROADS AND CARTAGE:		
Sept.	27	London, N.—New Roads	——	Vigers & Co., 4 Frederick's Place, Old Jewry, E.C.
"	27	Withington, Lancs—Street Works	Urban District Council	A. H. Mountain, Surveyor to the Council, Withington.
"	27	Pentre, Glamorgan—Footways, &c.	Urban District Council	Surveyor's Department, Council Offices, Pentre.
"	28	Witham, Essex—Indulated Stone-Paving	Urban District Council	W. P. Perkins, Surveyor, Witham.
"	28	Bollington, Cheshire—Stone	Urban District Council	S. Knight, Clerk, Council Offices, Bollington.
"	28	Failsworth, Lancs—Road-Sweeping	Urban District Council	Surveyor, Failsworth.
"	28	Rugby—Water Cart	Rural District Council	T. W. Willard, Surveyor, Rugby.
"	30	Cheriton, near Folkestone, Kent—Widening, &c.	County Council	F. W. Ruck, 86 Week Street, Maidstone.
"	30	Filey, York—Street Works	Urban District Council	R. M. Robson, Surveyor to the Council, Filey.
"	30	London, S.E.—Street Works	Urban District Council	H. W. Longdin, Surveyor, Town Hall, Anerley, S.E.
"	30	Motherwell, Scotland—Roadway	Town Council	J. M'Millan, C.E., Cowgill, Lamington.
"	30	Whickham, Durham—Materials	Urban District Council	T. Lambert, Clerk, Town Hall, Gateshead.
"	30	London, W.—Shingle	Paddington Borough Council	Surveyor's Office, Town Hall, Harrow Road, W.
"	30	Heaton Norris—Granite Setts	Urban District Council	W. Hodson, Clerk, Council Offices, Heaton Moor, Stockport.
Oct.	1	London, S.W.—Footpaths	Middlesex County Council	H. T. Wakelam, County Surveyor, Guildhall, Westminster.
"	1	Aldershot—Granite	Urban District Council	W. E. Foster, Clerk, Aldershot.
"	1	Hampton, Middlesex—Kerbing, &c.	Highways Committee	H. T. Wakelam, County Engineer and Surveyor, Middldsex Guildhall, Westminster.
"	1	Gt. Yarmouth—Granite Paving Blocks	Tramways Committee	J. W. Cockrill, Borough Surveyor, Town Hall, Gt. Yarmouth.
"	2	Sunderland—Road	Corporation	Surveyor, Town Hall, Sunderland.
"	2	Weston-super-Mare—Playground	School Board	H. F. Price, Surveyor to the Board, Weston-super-Mare.
"	3	Castleford—Improvement Works	Urban District Council	Mr. Green, Surveyor to the Council, Castleford.
"	7	Cradley Heath, Staffs—Granite	Urban District Council	A. Homfray, Clerk, Cradley Heath.
Nov.	30	Johannesburg—Pavements	——	"The Times," London, E.C.
		SANITARY;		
Sept.	27	Barnsley—Sewers, &c.	Rural District Council	J. Senior, Clerk to Parochial Committee, Carlton, near Barnsley.
"	30	Leiston, Suffolk—Removal of Refuse	Urban District Council	J. Fry, Clerk, Saxmundham.
"	30	Milnrow, Lancs—Sewers, &c.	Urban District Council	James Diggle, Civil Engineer, Hind Hill Street, Heywood, Lancs.
"	30	Radcliffe, Lancs—Sewers, &c.	Urban District Council	W. L. Rothwell, Surveyor, Council Offices, Radcliffe.
"	30	Whickham, Durham—Sewer	Urban District Council	J. McGregor, 71 Spoon Street, Dunston.
"	30	Hale, Cheshire—Sewers, &c.	Urban District Council	F. J. Lobley, Council's Engineer, Albert Road, Hale, Cheshire.
"	1	Bradford-on-Avon—Sewers	Urban District Council	S. Howard, Surveyor, Town Hall, Bradford-on-Avon.
"	1	Dover—Sewers, &c.	Town Council	H. E. Stilgoe, Town Hall, Dover.
"	2	Barham, Suffolk—Sewers, &c.	Guardians	H. Miller, 16 Museum Street, Ipswich.
"	3	Bray, Island—Cement	Urban District Council	P. MacDonnell, Clerk, Town Hall, Bray, Ireland.
"	8	Bradford—Scavenging	Cleansing Committee	J. McTaggart, Destructor Works, Hammerton Street, Bradford.
Oct.	8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
		TIMBER:		
Sept.	28	Plymouth—Timber	——	T. F. Plowman, 4 Terrace Walk, Bath.
"	30	London, E.C.—Telegraph Poles, &c.	——	C. E. Stuart, Controller of Stores, General Post Office, E C.
Oct.	1	Great Yarmouth—Redgum Paving Blocks	Tramways Committee	J. W. Cockrill, Borough Surveyor, Town Hall, Gt. Yarmouth.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct.	1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
"	21	Leeds—Public Baths at Junction of Calveley and Broad Lanes, at cost not exceeding £8,000.	£30, £20, £10 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
"	21	Leeds—Public Baths and Branch Free Library in York Road, at cost of £15,000.	£50, £30, £15 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
"	29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
"	31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov.	15	London, N.W.—New Offices in Euston Road	£100, £75 and £50.	S. R. J. Smith, 14 York Buildings, Adelphi, London, W.C.
No Date.		Middlesbrough—Wesleyan Mission Hall, School and Classrooms.	——	W. R. Meggeson, Woodlands Road, Middlesbrough.
1902. Sept.	1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

Guaranteed Gearing

ROBERT ADAMS,
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The Originator and Leading Maker of the Modern
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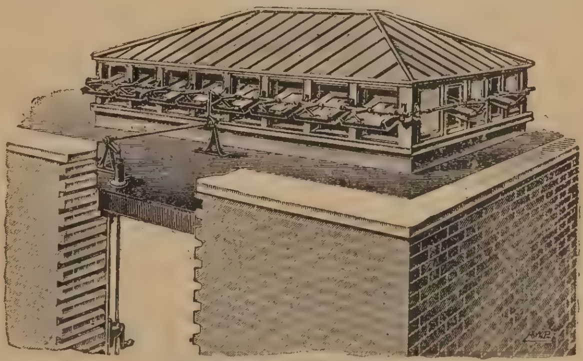
This Illustration shows the Gearing fixed outside, the Controlling Handle being within the Room.



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THE "VICTOR" SILENT DOOR SPRINGS
(Oil or Pneumatic Check Action).

FANLIGHT OPENERS. New Patterns.

PANIC-EGRESS BOLTS. Approved by the L.C.C.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	12	0		—	
Clover, best	per load	4	5	0	5	10	0
Hay, best	do.	5	0	0	5	10	0
Sainfoin mixture ..	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	8	0	1	9	2
Colza Oil, English ..	do.	1	8	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	6	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels ..	do.	1	9	10½		—	
Petroleum, American ..	per gal.	0	0	5¾	0	0	5¾
Do. Russian ..	do.	0	0	5¼	0	0	5⅝
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	19	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	6	0	1	6	6
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	6	6	1	6	9

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	82	0	0	83	0	0
Iron, Staffs., bar ..	do.	6	10	0	8	10	0
Iron Galvanised Corrugated sheet ..	do.	15	0	0		—	
METALS—*cont.*							
Lead, pig, Spanish ..	do.	12	0	0	12	2	6
Do. do. English common brands	do.	12	7	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	6	12	6	7	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	114	17	6	115	7	6
Do. English ingots ..	do.	117	0	0	118	0	0
Zinc, sheets, Silesian ..	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	15	0	16	17	6

TIMBER.

SOFT WOODS.		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	9	10	0	10	15	0
Do. do. 4th & 3rd	do.	7	5	0	10	15	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	11	0	0		—	
Do. do. 2nd „	do.	10	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
TIMBER—*cont.*							
Deals, Swedish	do.	8	10	0	10	5	0
Do. White Sea ..	do.	8	5	0	13	15	0
Do. Quebec Pine, 1st ..	do.	13	15	0		—	
Do. do. 2nd ..	do.	11	5	0		—	
Do. do. 3rd &c.	do.	9	15	0		—	
Do. Canadian Spruce, 1st	do.	17	0	0		—	
Do. do. 3rd & 2nd	do.	8	0	0	10	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	5	17	6	9	5	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	11	6	0	13	6
Do. 2nd ..	do.	0	8	6		—	
Do. 3rd &c. ..	do.	0	7	9		—	

COMING EVENTS.

Thursday, September 26.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. Henry R. Kenwood, M.B., D.P.H., on "Infectious Diseases," 7 p.m.

Friday, September 27.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. Henry R. Kenwood, M.B., D.P.H., on "Methods of Disinfection," 7 p.m.

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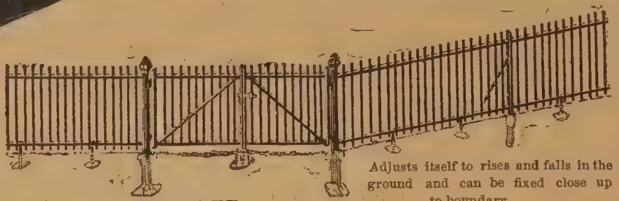

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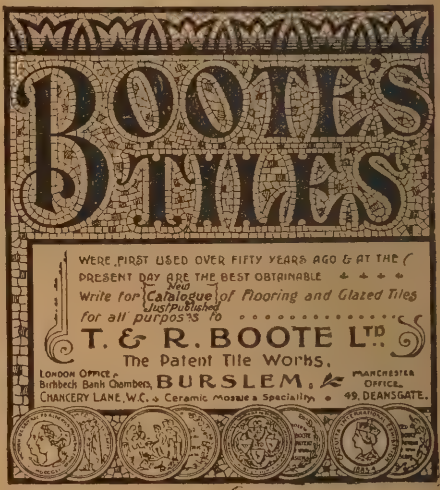

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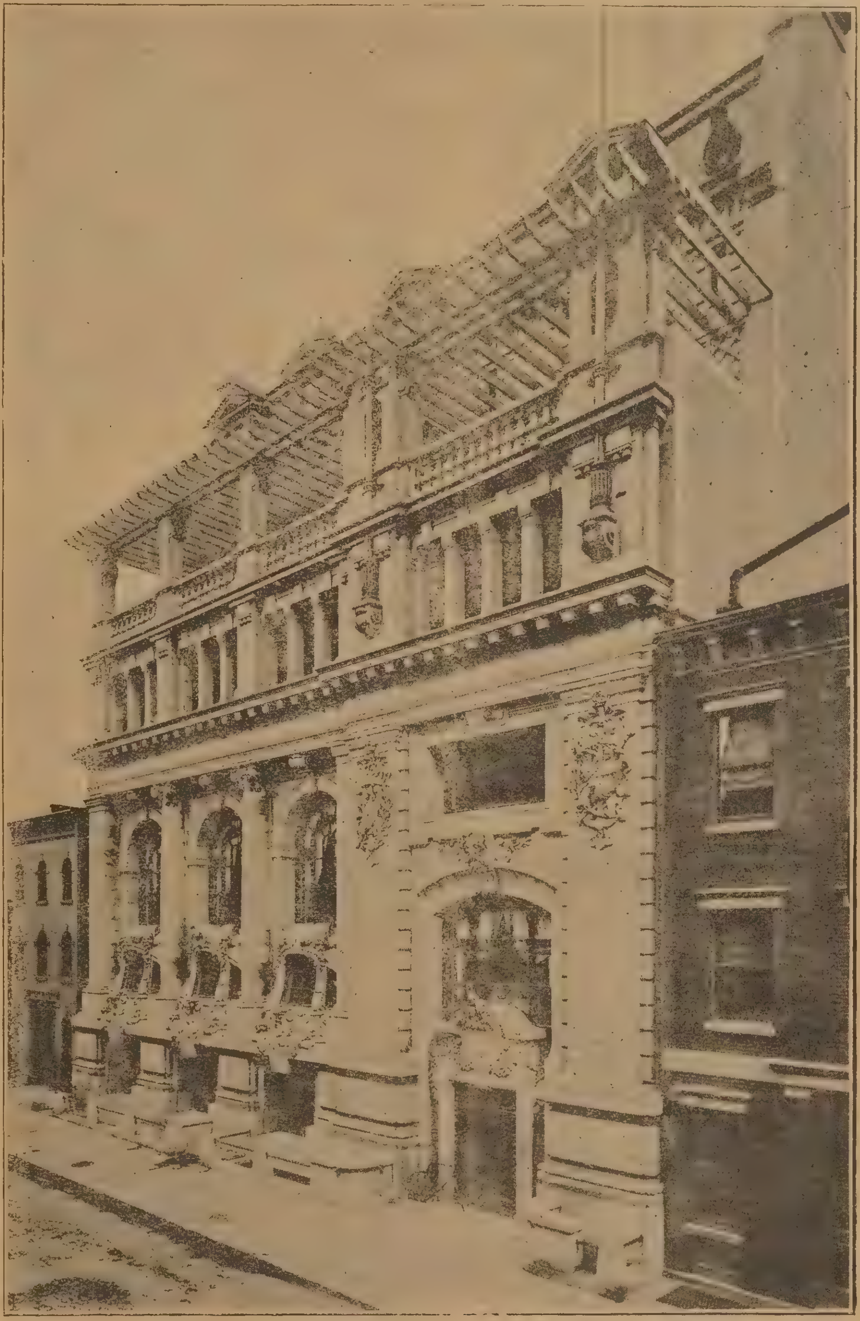
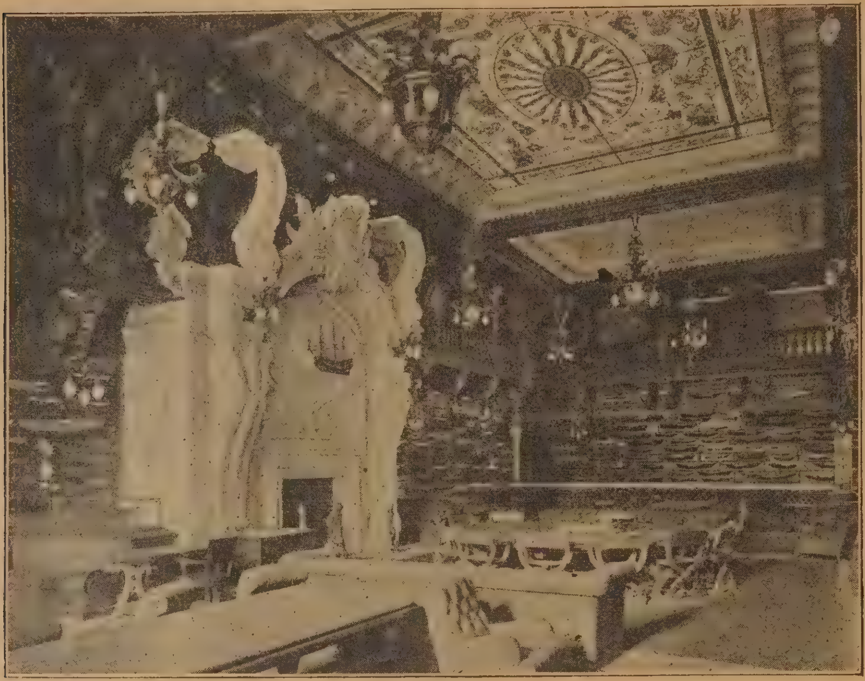
The New York Yacht Club. ALL eyes are now directed to the patch of water off Sandy Hook in which two yachts strain boom and topsail for a nation's honour. It is therefore opportune to publish the accompanying illustrations of the new club-house for the New York Yacht Club, which has been erected at West Forty-fourth Street from the designs of Messrs. Warren & Wetmore. It will be seen that the architects have attempted to emblematize in the details the purposes of the building, the lower portion of the large windows on the principal facade representing (we presume) the stern of an old-time boat, with the water flowing on to the keystone below. The same symbolic treatment is exhibited throughout the interior. The model-room has a most curious chimney-piece, with Columbus and his ship discovering America behind the left-hand pilaster, models of members' yachts being arranged around the walls. The grill-room—with its strong wooden beams and brackets—gives one the impression of a large cabin. The timbers shown exposed at the top of the front facade are for the purpose of supporting an awning in the summer, when the balcony is used as a roof-garden.



CLUB-HOUSE OF THE NEW YORK YACHT CLUB. WARREN AND WETMORE, ARCHITECTS.

The Liverpool Cathedral Problem. AFTER a long discussion the site and style for the proposed cathedral at Liverpool have been selected—the site, St. James's Mount; and the style, Gothic. But this by no means puts an end to criticism; rather, such a decision lashes it to a further controversy. The battle of the sites (of which there were originally four under consideration) has been zealously fought, but it soon became evident that two were to be relinquished, leaving Monument Place and St. James's Mount for the final selection. There can be no doubt that the former is in every way the better site; but, when it became known that £200,000 would be needed for the land alone, the Cathedral Committee very naturally turned to the St. James's Mount site, which, though not possessing anything like so good an approach, will probably only cost about £50,000. Monument Place contains the chief public buildings in Liverpool—the municipal technical school, museum, library, the Walker Art Gallery, and the famous St. George's Hall. These buildings are of classic design, and any cathedral placed in proximity to them would need to be similarly treated. The St. James's Mount site has no such restrictions, for the surrounding buildings possess no architectural character—this by way of explanation only. The question which now presents itself is: "Should Mr. Emerson, whose *Gothic* design for the cathedral was chosen fifteen years ago, carry out his work?" This opens up a wide field of discussion, and we desire to deal only with the matter in its general and not in its personal aspect. As our readers are doubtless aware, the Committee intend to practically repeat what was done when the first competition was held—to invite architects (by advertisement) to submit portfolios of ecclesiastical buildings which they have erected, and from these architects to select a limited number to prepare designs. The Committee want the best possible work. If among the designs to be submitted any one excels Mr. Emerson's we consider that the Committee would be perfectly justified in adopting it in preference; but we may say that in our opinion Mr. Emerson's design is very satisfactory, exhibiting much freshness in treatment, and we doubt whether it would be surpassed. We consider, however, that the stipulation of Gothic as the only admissible "style" is both unjust and unwise, especially in view of the fact that the enthusiasm which gave life to a Revival is now long since dead, leaving the hearth cold. If the Committee were afraid of being inundated with "all sorts and conditions" of buildings which might be submitted in an open competition, the case would have been somewhat different, but in the circumstances it seems to us that no such restriction as to style should have been made. There is a good deal of talk nowadays about the reform which is urgently needed in our church-planning in order that it may be more suited to modern congregations. Certainly there is much truth in this, but great cathedrals are only filled on great occasions, and they are largely spectacular. Yet one is constantly hearing opinions which assume that such cathedrals are places always full of worshippers, whereas they are more commonly vast fabrics wherein tourists wander from wall to wall, making a great noise with their boots. Briefly, these are the pros and cons of the matter; but the Committee have decided the course they intend to adopt, and now we can but wait for the new designs. Then the discussion can be reopened with vigour.



THE MODEL-ROOM AT THE CLUB-HOUSE OF THE NEW YORK YACHT CLUB. WARREN AND WETMORE, ARCHITECTS.

THE NEW PLUMBING BY-LAWS OF THE LONDON COUNTY COUNCIL.

BY G. A. ALLAN, late Sanitary Inspector, St. Martin-in-the-Fields.

IN the United States of America the plumbing by-laws ("ordinances" they are there called) in the different cities and towns are administered by the building departments. The inspectors who are appointed to see that all plumbing work is done in accordance with the ordinances are plumbers, and their duties are restricted to the inspection of plumbing, water supply and drainage, and reporting thereon. The plumbing ordinances are periodically revised in the light of the experience gained in enforcing them.

In London the by-laws of the County Council with regard to plumbing are administered by the Public Health departments. The inspectors may or may not be plumbers. But as the supervision of plumbing and drainage is only a small part of a sanitary inspector's duties, it is less imperative that he should be a practical plumber: and in London when by-laws are passed it appears to be the intention that they shall remain unaltered *esto perpetua*.

However, in making drainage by-laws under the Metropolis Management Act of 1855 the County Council altered and amended the plumbing by-laws made under the Public Health (London) Act, 1891. The plumbing by-laws drawn up in 1893 are very incomplete, and are so loosely worded as to be capable of several interpretations. The same remarks apply to the drainage by-laws issued last June.

Under the plumbing by-laws it is not forbidden to connect the waste from a lavatory basin with the soil pipe, though bath and sink (other than slop-sink) wastes may not be so connected. Under the drainage by-laws the waste pipes from lavatories and sinks (other than slop-sinks) must be of lead, iron or stoneware, and be trapped with traps of lead, iron or stoneware. From baths, apparently, the waste pipes may be of zinc and untrapped. If, by the pedantic application of language, the word "lavatory" be used to include bath, then the use of the brass traps sent out with so many baths is prohibited.

Under the drainage by-laws the soil pipe may be fixed inside a new building, but if so fixed it must be of lead. The sizes of the sockets on cast-iron soil pipes are specified, but the amount of lead to be used in the joint is left to the judgment of the person fixing it.

The soil pipe must be circular. Provision is made for the jointing of flanged soil pipes: the joints are to be "securely bolted together with some suitable insertion," but it is not specified who is to decide whether the material inserted is or is not suitable.

Although it appears to be the intention of the County Council in issuing as a "drainage" by-law an amended form of their "plumbing" by-law as to soil pipes to supersede the latter, the statement is not directly made. Where they conflict the latter will prevail. Where they do not conflict both will presumably be in force. Both specify that "the soil pipe shall be continued upwards to such a height and in such a position as to afford by means of the open end of such soil pipes a safe outlet for foul air." It is further specified in the plumbing by-law that the above safe position "shall in all cases be above the highest part of the roof of the building to which the soil pipe is attached and, where practicable, be not less than 3ft. above any window within 20ft. measured in a straight line from the open end of such soil pipe." As this requirement is omitted from the later by-law it is presumably not now considered necessary.

A serious omission in the plumbing by-laws has been rectified. Until June last, while the soil pipes were well regulated, the ventilation pipes were not. Their size and connection to the soil pipe were defined. Now their material, weights, mode of jointing, and position are also specified. But here even the theoretical men have been at fault. Although there is no building in London needing a larger soil pipe than one having a diameter of 4in., regulations exist for soil pipes of 5in. and 6in. diameter; but ventilation pipes, which should be enlarged according to the number of closet traps ventilated and also according to the length of the pipes, need only be of 2in. diameter for any number of closets and any length of pipe, and when the ventilating pipe enters the soil pipe above the highest closet branch the soil pipe is not required to be enlarged. In St Paul, Minnesota, U.S.A., the trap ventilation pipe must extend as high as the soil pipe. It is not permitted to connect it to the soil pipe above the highest branch. It is only permitted to run the 2in. pipe for 40ft.; it must then be enlarged to 3in. for the next 30ft., and again enlarged to 4in. for the rest of its length. In the adjacent city of Minneapolis the ventilation pipe may be connected to the soil pipe above the highest branch, but the soil pipe must first be increased to 6in. diameter. To anyone knowing anything of the friction of air moving in pipes the anti-syphonage pipes seen so often in England are palpably ridiculous.

The new by-laws also regulate the size, weights, modes of jointing, materials, and position of the waste pipes from slop-sinks and urinals. Briefly, the pipes shall be of 3in. diameter, and shall be fixed very much as are soil pipes under the by-laws.

It is a pity that wash-out closet-pans were not specifically prohibited. It is also a pity that the County Council have wasted so much energy in specifying how lead pipe shall be joined to iron, stoneware to lead, stoneware to iron, lead to stoneware, and iron to stoneware, seeing that they have nullified all five clauses by allowing that "it shall be sufficient" if the work be done "in an equally suitable and efficient manner." The door is thus opened to any number of conflicting opinions. There are many ways of jointing these different pipes, none of which are any improvement on the ways specified by the London County Council.

THE GRILL-ROOM AT THE CLUB-HOUSE OF THE NEW YORK YACHT CLUB. WARREN AND WETMORE, ARCHITECTS.

WOODEN HOUSES IN FRANCE.—I.

BY JEAN SCHOPFER.

IN Switzerland the art of wooden house-building has been exemplified in one of its most picturesque forms, the principal causes which have made it so full of grace and animation being a right comprehension of the qualities and properties of wood and an application of building rules appropriate to the material employed. But the Swiss châlet does not exhaust the uses to which wood can be put. It serves other purposes, and not less interesting ones. The ancient and venerable art of carpentry has taken more than one architectural shape, and those who study its various developments are charmed by beauties which, while simple, evidence great skill.

We should like now to visit the old towns of France and seek out their wooden houses, those precious relics of the domestic architecture of the Middle Ages which reveal to those who know how to question them an abundance of curious things concerning the kind of life and the notions of art of the people of those distant times.

The wooden houses of France date from the end of the thirteenth century, from the fourteenth, fifteenth and (less frequently) sixteenth centuries, whereas the châlets belong—a few to the sixteenth century, but the majority to the seventeenth and eighteenth centuries. Thus the Swiss art would seem to be a continuation of the French, to which it is posterior. It is worth our while to stop to notice this apparent contradiction, for in explaining it we shall touch upon one of the essential points in wooden house-building and accentuate the differences of construction in the various countries.

In the Middle Ages the system of building followed in France was that called *pan de bois*. A glance at one of the photographs here reproduced will show what is meant by this term. It is a system of framework in which the resistance of the timber, serving in turn as brace or support or belting-course, is greatly increased by the multiple combinations of the joinery. The spaces left between the different pieces of the framework are pugged, that is to say, filled in with materials—old plasterwork, bricks, &c., which do not bear but simply stop up. The *pan de bois* constitutes the carcase of the house. It is, in fact, the present method of building in wood, the only one that French carpenters know; but the wooden framework is now exclusively employed for attics and upper storeys, stone or brick forming the bearing part, whereas in the edifices of the Middle Ages the *pan de bois* was systematic and general.

In Switzerland, on the contrary, we find in most cases beams piled one on another, crossed and let into each other at the angles. The timber is massive. All the beams bear equally; no combination of framework or any relieving arch or keyed-in support is needed. It is, in fact, the ancient blockbau, or log house, refined by decoration being added. The *pan de bois*, employed also in Switzerland, comes from Germany; what is peculiarly Swiss is the system of piling.

We have thus two distinctly opposite methods of construction; one consisting of clever combinations, and the other being a simple throwing together of materials. One is refined and the other primitive. Now, the stacking-up system is of ancient origin, although the examples we have are almost modern. It is even probable that it represents the earliest manner of building employed by the Indo-Germanic races. The Swiss châlets are thus connected with very ancient modes of construction, which they perpetuated at a time when for several centuries a more skilful manner of building had been developed in France and countries adjacent thereto.[*] Had we time to seek for the reasons for this we could find several. Among them would be the different species of timber. In Normandy, for instance, oak is used, a knotty wood hard to cut up and having irregular shoots. Hence the employment of frames, the pieces composing which never exceed a moderate size. In Switzerland the fir-tree abounds, with its slender stems. It has few gnarls, is easily cut, and furnishes without trouble the long regular beams required for the blockbau. We have to mention, too the geographical reasons. It is easy to see how, in the isolated Alpine valleys, unaffected by external influences, old traditions retained their sway—traditions which carry us back to primitive ages; whereas in Northern countries, near those seas on which Normans and Danes passed their adventurous existences, it is natural that the skill necessary for the building of ships should have had an influence on the development of the art of wooden house-building. These comparisons make clear the whole art of working in wood.

One general observation is called for before we proceed with our subject. The Swiss edifices are isolated. Even in the villages each châlet is an entity, with its four sides, and the great majority of the examples are country or mountain dwellings. In France, on the contrary, the wooden houses are in towns; we shall meet with scarcely a single country house. Most of them are urban habitations, and have only one face, except when they stand at a corner. The purposes to be served by these two kinds of houses are totally different, and this has given each kind a distinct aspect. In Switzerland the roof projects considerably and at the corners shelters the galleries and the staircase, which latter is nearly always outside the house. On the front, under the roof, one finds a balcony. In the town houses, however, the staircase is inside, while the sides of course could not have anything on them, being party walls. Besides, the parochial regulations prescribed a certain width of street, and this led the architects to put successive projections on every storey in order to gain room. Consequently, in narrow streets the upper parts of the houses almost touched each other, and there was no place for a balcony. Furthermore, a store usually had to be set up on the ground floor. At the top we find the gable sometimes in front and sometimes at one side. Finally, the necessity of utilising the ground to the fullest extent possible led to houses of several storeys being built. In Switzerland there are no châlets with more than two storeys above the ground floor, whereas in French towns there are many houses with five. (See the house at Angers shown in Fig. 1.)

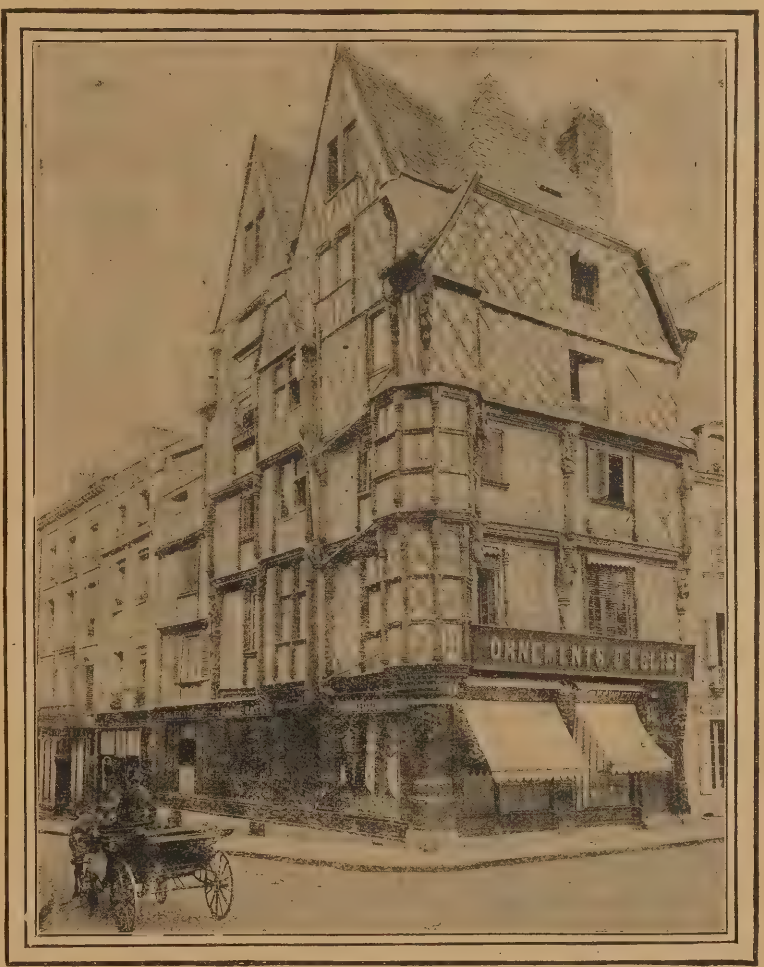


FIG. 1.—LE LOGIS ADAM, ANGERS.

We thus see that the conditions of existence were entirely opposite. In fact, no two things could differ more than the châlet and the French house differ from each other, both in arrangement and in decoration. Not only do they not serve the same requirements, but, their type once fixed, they develop under totally different conditions of living—here, in the calm and peace of a mountainous country, without excitements and unstirred by the shocks incidental to artistic progress; there, on the contrary, in commercial towns, where the increasing demands of luxury develop resources, where the political struggles of the *bourgeoisie* against the bishops and the feudal lords gave formidable strength to the middle class, in centres where arose the most admirable art movement ever witnessed since that of Greece, namely, that known as the Gothic movement, but which is French; in short, in a land which has restored monumental sculpture to the world. Here, therefore, we find a purely ornamental decoration and there a figurative one; in Switzerland, the continuation of neo-Latin tradition; in France, the influence of Gothic statuary.

* * * * *

The building of houses in wood dates back to remotest antiquity. The Romans introduced into Gaul the art of stone-working, but stone did not take the place of wood. It served other purposes—for big edifices such as temples, theatres, arenas; for bridges, aqueducts and other public works which the Romans executed in the lands colonised by them, and also, no doubt, for the villas in which the chief officers dwelt. But although the Gauls adopted stone as a building material, they continued to use wood as well, which they knew how to manipulate and turn to the best account. The woodworking tradition retained great vitality in Gaul, as is shown by the fact that when invasions destroyed Roman rule and covered the country with a new flood of barbarians, stone fell into disuse and was replaced almost everywhere by wood, even for important buildings. In the time of the Merovingians the churches, according to Gregory of Tours, were built of wood. They were ornate and for the period sumptuous edifices, covered with paintings. It was the same under the Carolingians. This explains the frequent fires which destroyed houses and churches. A large number of neo-Latin churches and Gothic cathedrals existed first in wood, and after having been burnt down were rebuilt in stone.* Nothing remains of the wooden constructions of those distant times. Besides, stone was never altogether discarded; it certainly was employed concurrently with wood for churches and cathedrals. Under the Carolingians, with the Renaissance of learning which was promoted by Charlemagne, stone played the leading part in public edifices, but wood held its own as a material for private houses.

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[*] "The construction of châlets (piling) is most interesting to study. It is one of the systems of building which approaches the nearest in Europe to the wooden structures of primitive times."—Viollet-le-Duc.

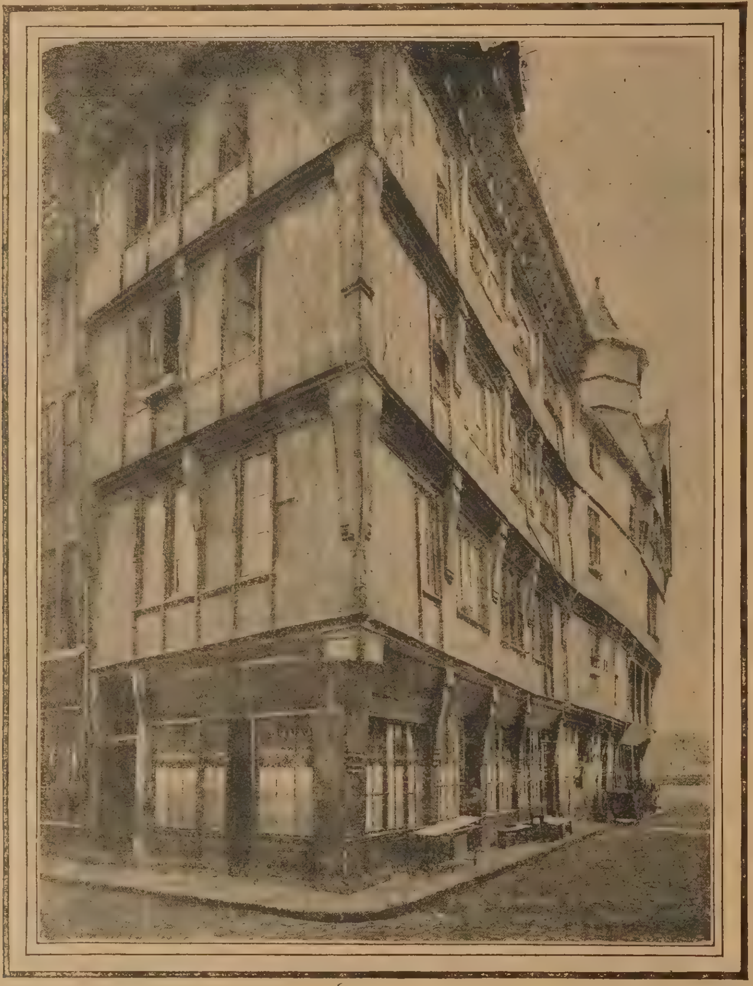

FIG. 4.—THE FORTIFIED HOUSE AT ROUEN.

In the twelfth century the influence of the great Cistercian and Cluniacensian Orders tended to the replacing of wood by stone nearly everywhere. This is the period when, in France, wood played the least important role in domestic architecture. Wherever the monks of Cluny or of Citeaux brought their influence to bear stone was first, even in the countries most deeply impregnated with Northern and barbarian elements. In Normandy stone appeared as a competitor of wood, the result being compromises of the kind shown in the Bayeux Tapestry, namely, a ground floor in masonry with an upper storey in wood. Viollet-le-Duc or M. Courajod would see in these buildings the affirmation of a Roman survival of that Northern and barbarian ideal which was designed to triumph on French soil with thirteenth-century art.

Wood had its revenge in the middle of the thirteenth century, the way having been prepared for it by political and social changes. This was the period when the *bourgeois* class prevailed in their struggle with the lay and ecclesiastical authorities. Using sometimes lord against bishop and sometimes the king against both, they extorted charters everywhere, and when their rights had been guaranteed they were able to work with a certainty of enjoying the fruits of their labours. It was a rich and hardworking class, attached by its condition and its wealth to the cities and towns. Stone, which had been used chiefly by the nobles for their castles and by the Church for its religious edifices, offered fewer advantages for the *bourgeoisie*. Wood could be worked far more rapidly and was much cheaper. Hence it was adopted by the middle class. From the end of the thirteenth century throughout the fourteenth and fifteenth, and even in the sixteenth before the neo-classic Renaissance had produced its full effects and become absolutely triumphant—a triumph destined to endure who shall say how many centuries?—wood was in general use for urban constructions.

Consequently, the buildings we have to examine are town houses, erected for merchants and people in easy circumstances. They are not distributed uniformly over France. The South, where Gallo-Roman culture flourished, and where also timber was scarce, retained the habit of using stone even for the humblest dwellings. We cannot offer a single example of a wooden house in Provence or Languedoc. As can easily be imagined, the bulk of the types are found in the West—Brittany, Vendée, Normandy—and in the North. There are a few in the centre and in the East. In Dauphiny and in the mountainous districts there are some châlets which closely approach the type most common in Switzerland—square beams piled one on top of another. Finally, in Normandy there still existed about fifty years ago some houses surmounted by a piece of wood in the shape of a crest, which connects the Norman edifices with the Norwegian and general Northern style.

At Angers there is a fine corner house (Fig. 1) which shows in a clear manner a few of the characteristics of urban wooden houses. It is called *Le Logis Adam*. The *pan de bois* is in lozenges, with the sablière beams strengthened, distinctly marking the division into storeys. The corbelling is not pronounced. The walls are divided into panels by vertical beams, which are ornamented and decorated. The house has a picturesque aspect; it is symmetrical and ingenious. At the corner is a *bretèche* with five faces, built corbelwise. Very often the *bretèche* served as a staircase which, as in most houses of the Middle Ages occupied by a single family, was inside and went directly from the hall to the floor above. Sometimes, however, the *bretèche* simply enlarged the hall and formed a pleasant corner nook, whence, through a couple of small windows, one could see far up the street. On one of the fronts is the main door (on the other was also a door, but it has now disappeared) surmounted by a projecting *pan de bois* reaching to the roof, which has two gables on one side, a piece of wall forming the coping on the other front. The roofs are covered with shingles. We see shingles again over the sablières of the second floor, to keep off the rain. We have met with the same method of protection, so necessary to wooden constructions, in more than one Swiss châlet, where it is carried out with a logic that goes to an extreme. The framework is in well-preserved oak. It is to be noted that timber keeps much better when exposed to the open air than when it is covered with a coating of plaster. The plaster, by preventing the action of the air, keeps the wood in a constant state of dampness which soon eats into and deteriorates it. The woodwork constructed by those excellent carpenters of the Middle Ages has lasted several centuries, and would endure still longer if it were not that these pacific and civilised times of ours are more destructive to the ancient beauties than the most troublous periods of the past. It is to be feared that the time is not far distant when there will not remain a single wooden house to tell us how those of bygone days loved to live, what a taste they had for art (although we often call them barbarians!), and how well they displayed this taste in matters of everyday-life. We have made art a thing for museums. Our houses are comfortable (not invariably, though), but by no means artistic, and soon there will be no place, even in the remotest corners of France, for the wooden walls so dear to her ancestors. More than sixty years ago Pugin drew some of the old timber houses of France, with details of their decoration.* After a series of fine old models comes the last plate, entitled "The Present." It pictures some intrepid workmen cutting up pieces of beautifully carved timber belonging to old houses. To finish as quickly as possible with the past, they are throwing the fragments into an immense fire.

The carved decoration of the house at Angers is thoroughly in keeping with the spirit of the Middle Ages. How well we realise that we are in a part of the world where wood-carving is of all arts the most living, the best known and the most familiar! On the ground floor, under the *bretèche*, the corner is occupied by a tree, and everywhere—on the columns, the beam, and window-frame supports—we see angels, old women squatting, grinning heads, beasts and battles, monsters, and, what is really exceptional, a centaur, the whole forming a series of subjects and figures which give an appearance of life and animation to the old house. We do not assert that these carvings are of great artistic merit, but they are in their place, they are not pretentious, they express what they are intended to say, and bear witness to an attention to art

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* There exists at Troyes, in the Cancleus quarter, a wooden church, called the Chapelle Saint-Gilles, which is the only specimen still standing of a kind of building very common in olden times.

* "Details of ancient timber houses, XVth and XVIth centuries, from those existing at Rouen, Caen, Beauvais, &c." By A. Welby Pugin. London, 1836.

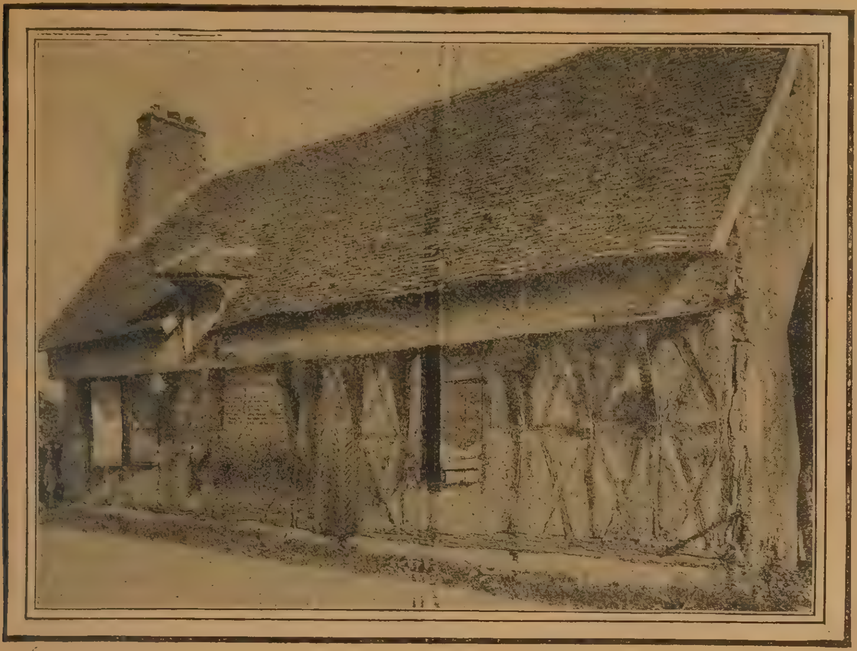


FIG. 2.—OLD "MAIRIE" AND SCHOOL-HOUSE AT FONTAINE-EN-SOLOGNE.

which was as common then as it is rare nowadays. Before leaving "*Le Logis Adam*" we must note the fine projections of the sablière beams and the strong accentuation of the window frames. These marked reliefs are quite in accordance with the best traditions of woodworking.

Fig. 2 is a rustic model, the only one we are able to offer. It is the old town hall of Fontaine-en-Sologne (Loir-et-Cher). The building is the simplest that could be, and the least ornamented, consisting of only one floor, on a level with the ground. The walls are schematic. Note how ingeniously the big beams of the roof are upheld by a piece of timber resting on a middle beam. It is impossible to fix the date of this house to a couple of centuries. When there are no carvings which will guide one it is often daring to speak positively, as the traditions of a trade remain fundamentally the same for ages. The primitive framework having once been found, it continued to subsist practically unchanged. The only guide to the date of an edifice are the additions made at later periods. In regard to the old town hall of Fontaine-en-Sologne, we would draw attention to the survival of an ornament of the highest antiquity—we mean the decoration in diagonal laths reproducing the decoration applied to stone or pottery by the Gauls many centuries before the Roman conquest. See as an example of this the celebrated Gallic warrior in the museum at Avignon, on whose shield there is the same kind of ornament. We are not aware that it has been remarked before on any building.

Reverting now to urban dwellings, we have in Fig. 3 the Château at Thiers, a fifteenth-century house with a *pan de bois* of regular arrangement, the traditional corbellings, a shop on the ground floor, and a handsome roof with a shapely gable whose projection is supported by a frame the lines of which are most harmonious. The proportions of this house are excellent, and the roof is exceptionally elegant.

The "Fortified House" at Rouen seen in Fig. 4 is much more massive. It has a rude aspect. The solid arris, the big horizontal beams of the first floor, protected by boards, the coping and the turret, speak of a troubled period and the need of being able to defend one's house in case of an outbreak. Rouen, which is so rich in art, will furnish us with other examples more ornate and delicate. Indeed, in Fig. 5 we have one of the most richly decorated wooden edifices that has come to our notice.

The method followed in this case differs from what we have seen in the preceding examples. The *pan de bois* is entirely covered with carved boards, and the house has the appearance of a richly-worked piece of wainscotting. It is the flaming Gothic style, and we can readily fix the fifteenth century as the one in which the house was built. The carvings are most ornamental; the frieze which crowns the first floor has a fine effect, but some people may think that this decoration, rich though it be, is not properly architectural, and that the house lacks the relief which wooden constructions often present.

The houses which follow are of quite another character. The first of them (Fig. 6) dates from the fifteenth century and is located at La Rochelle. It is distinguished by an arrangement of parallel vertical beams going from one storey to another and crossed by a single beam placed diagonally. The intervals are filled with white plaster, from which the dark lines of the beams stand out strongly. The general decorative effect is very curious. The arrangement has been largely copied in English for modern country houses, probably without any knowledge of its origin. The ground floor and the entresol of the house at La Rochelle are in stone; then, on a large corbel supported by stone consoles, comes the woodwork.

We have selected a specimen in Brittany which is to a great extent similar (Fig. 7). These houses are situated at Auray, the celebrated place of pilgrimage. There is the same kind of vertical arrangement of the beams, although the house is laid out in a totally different manner from the preceding one. Many other examples might be cited, but those given are sufficient to illustrate this manner of construction. We will add, however, on account of its elegant first floor and its fine crowning frieze, the "Hotel du Grand Cerf" at Andelys, whose walls are relieved by console beams which have a most happy effect (Fig. 8).

(*To be concluded.*)

The Hull Memorial to Queen Victoria.—The special committee for the Queen Victoria Memorial which is to be placed in the centre of the proposed City Square at Hull met last Friday to make a selection from the designs submitted. The cost of statue and pedestal is not to exceed £2,750. Drawings were exhibited from Prof. Edward Lanteri, Mr. Henry C. Fehr, Mr. P. McCrossan, Mr. Toft and Mr. F. W. Pomeroy. It was decided to invite Messrs. Pomeroy, McCrossan and Fehr to submit models of their designs, for which the committee agreed to pay £25. The committee includes the following architects: The Mayor (Alderman Gelder), Mr. F. S. Brodrick, Mr. J. Bilson and Mr. Jacobs.

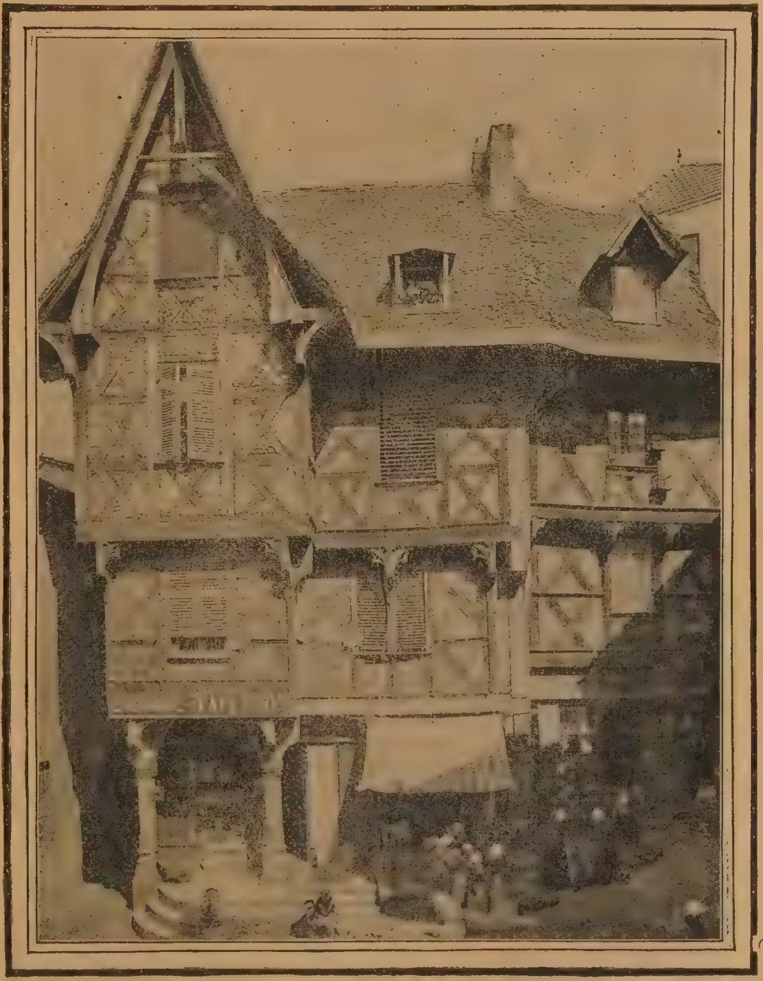


FIG. 3.—CHATEAU AT THIERS (A FIFTEENTH-CENTURY HOUSE).

Correspondence.

Barfreyston Church, Kent.

To the Editor of The Builders' Journal.

London, S.W.

Sir,—It is not generally known that this church (illustrated in your issue for September 18th), which dates from the year 1080 and is pure Norman without any subsequent additions, was taken down and rebuilt about sixty years ago.

The circumstances of the rebuilding are thus related in the history of the Gillman family by Mr. A. W. Gillman, the grandson of Coleridge's friend, Dr. James G. Gillman, of Highgate, in whose house (No. 4, The Grove, Highgate) Coleridge passed the last eighteen years of his life:—

"After acting for a short time as undermaster at the Highgate Grammar School, he (the Rev. James Gillman, son of Coleridge's friend) was presented by St. John's College, Oxford, to the living of Barfreyston, Kent, in October, 1836, a village situated about half way between Canterbury and Dover, celebrated for one of the most beautiful small Norman churches that exists in England. This church, which was probably designed by the architect and built by the masons employed at Canterbury Cathedral, is remarkable for its beautiful carved south door, circular Norman window and carved work outside the church.

"Owing to its age and the subsidence of the soil—the church standing on a knoll of ground which had been excavated for graves—the walls had become much cracked and out of the perpendicular, so that the stability of the whole structure had become endangered.

"The Rev. James Gillman soon after his presentation saw that the restoration or rebuilding of the church was inevitable. At that time but few old churches had been restored and the subject was but little understood. The popular idea on the subject was the old churchwardens' fashions of beautifying and adorning by plastering and whitewashing. The new rector superintended the work himself, with reverent care, under the direction of Mr. Twopenny, architect. It was necessary to take down all the principal walls down to the foundations. Every stone was carefully numbered and laid in its place on the grass of the surrounding churchyard, the greatest care being taken not to remove any of the lichen or moss that had grown on the outside stones, but only to clean and remove the churchwardens' whitewash where necessary. When the church was rebuilt, all the stones were placed back exactly in their original position, the only difference being that they were upright and exact in their fitting as the church has been 600 years before."—("The Gillman Family: The Gillmans of Highgate," pp. 159-60.)

The author of the above does not speak from actual observation, as he was not born until 1843, and the rebuilding appears to have taken place shortly after his father's induction to the living of Barfreyston in 1836, probably about 1840. When the walls were taken down the original roof was removed and was replaced by a deal king-post roof. A stone pulpit and font from the designs of Mr. J. P. Seddon were placed in the church a few years ago. The church was measured and drawn in 1888 by Mr. Detmar Blow, and the drawings were published in the Architectural Association Sketch Book, N.S., vol. 10 (Kent).—Yours truly,

JOHN HEBB.

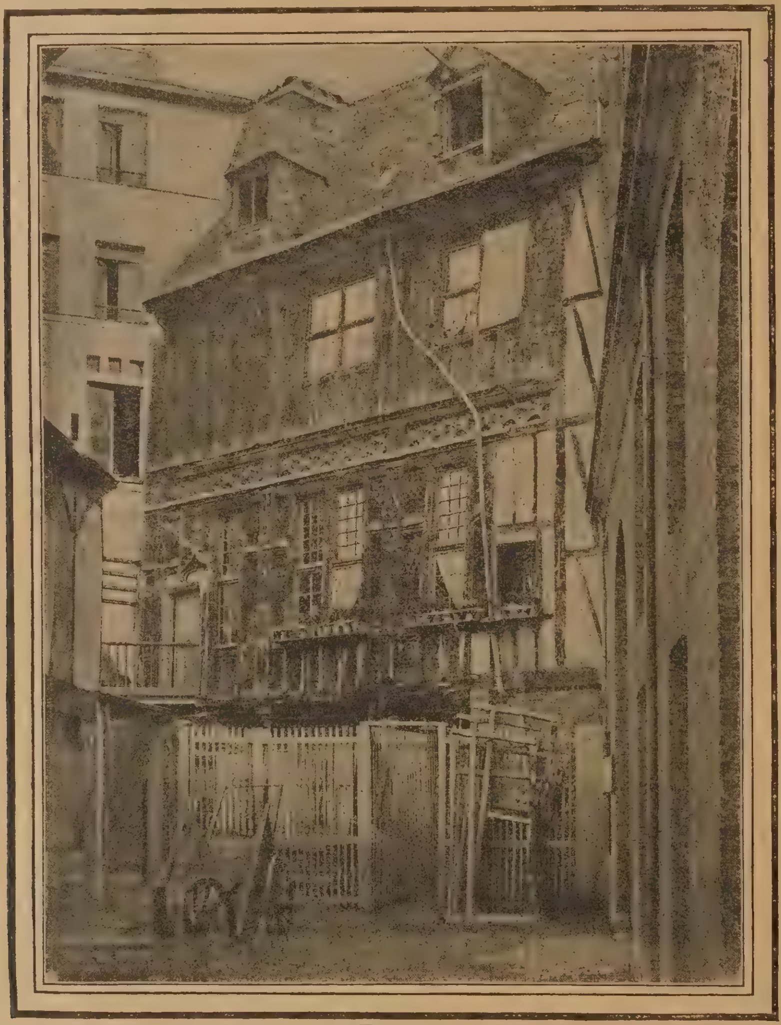


FIG. 5.—A GOTHIC HOUSE AT ROUEN.

The London Building Act, 1894.

To the Editor of The Builders' Journal.

London.

Sir,—Allow me to point out that the remarks published on p. 81 of your issue for September 18th relative to the above Act were misleading. The fourth section of the Act provides that the "Act shall, save so far as otherwise provided, extend to London and no further," and section 5 (40) defines the expression "London" as "the administrative county of London"; that is to say, the area constituted by the Local Government Act, 1888 (51 and 52 Vict., c. 41), which extends from Highgate on the north to Sydenham and Penge on the south, and from Kilburn on the west to the river Lea on the east, and includes the City of London. Part III. of the Act, which relates to lines of building frontage, does not apply within the City. There is a further exemption in favour of the City in section 9 (4, 5) as to wooden structures; in section 84 as to signs and lamps; in section 164 as to by-laws from which the City is exempted; as to obstructions in streets in section 199, and as to certain buildings, namely, the Mansion House, Guildhall, Royal Exchange and the Bank of England; but with these exceptions the London Building Act applies to the City of London, the Act being administered by four district surveyors.

The Corporation of London from an early period made ordinances embodying regulations with respect to building without the intervention of Parliament, the Lord Mayor being supreme within the City. The main object of these regulations was the prevention of the spread of fire. One of the earliest of these ordinances prohibited the use of thatch as a roof-covering and required roofs to be covered with incombustible materials.

The Great Fire of 1666 appears to have directed the attention of the Legislature to the necessity of further safeguarding the City, and in the following year, 1667, an Act was passed for rebuilding the City of London (19 Car. II., c. 3), consolidating the various enactments with regard to building. This was followed in 1670 by a further Act entitled "An additional Act for the rebuilding of the City of London, uniting of parishes and rebuilding of the cathedral and parochial churches within the said City" (22 Car. II., c. 11); and these statutes, together with an Act passed in 1707 to prevent the mischiefs that may happen by fire (6 Anne, c. 31), form the nucleus of the law with relation to Metropolitan buildings.

In 1724, in consequence of litigation arising out of party walls, a special Act (11 Geo. I., c. 28) was passed to provide for the apportionment of the costs of rebuilding these structures, the provisions of which were compulsory within the City and its liberties. These provisions did not apply to the City of Westminster and the outlying parishes, which were not included in the Building Act until some time after. Other Acts followed, but it was not until 1774 that an Act was passed (14 Geo. III., c. 78) which incorporated the leading principles of the law concerning these matters and embraced all the material provisions of the former statutes. In the words of Mr. Noel H. Paterson in his introduction to Woolrych's edition of the Metropolitan Building Act, 1855, "the safety of premises against fire, the architectural disposition of party walls, the compulsory process to make parties assent to such erections, the duties of district surveyors, the rewards given for activity in bringing up engines to a fire, and the general forms of procedure necessary towards carrying out the Act—all these were prominent features in this statute." Notwithstanding its defects, this Act remained in force until the passing of the Act 7 and 8 Vict., c. 84, which not being found satisfactory was for the most part repealed by the Act of 1855 (18 and 19 Vict., c. 122), by which London buildings were governed until the passing of the London Building Act, 1894.—Yours truly, J. H.

Masonry Classes at Battersea Polytechnic.

To the Editor of the The Builders' Journal.

London, S.W.

Sir,—In your issue for September 18th you state that the class in masonry at Battersea Polytechnic is a new departure. Allow me to point out that this is a mistake, as the masons' classes were started at Battersea when the Institution opened, and were conducted for about three years by Mr. Henry Flint, whom I succeeded. I am now just starting my fifth session as instructor of these classes. I may also state that five County Council evening exhibitions, value £10 each, and various certificates from the City and Guilds of London, have been awarded to Battersea mason students.

The only alterations in the syllabus for the present session are that the elementary class meets on Tuesday instead of Friday, and the advanced class on Thursday instead of Wednesday.—Yours truly.

JOHN WORNELL.

"The Magazine of Art."

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—If your simple-minded Welsh correspondent had enquired when the "Magazine of Art" was first published, he would have been asking a question difficult to answer. The first three volumes are bibliographical curios, for none of them possess either preface, date or any indication of the time of their issue. But I happen to be in a position to state that the first number appeared in January, 1878. Underneath an etching by Hubert Herkomer which forms the frontispiece to the next year's issue occur the words "Magazine of Art, Vol. II.," but there is absolutely no date given, Vol. III. being similarly dateless.

When the publishers' attention was drawn to these odd omissions some years ago Mr. M. H. Spielmann explained that the first three years' issues were never put into volumes by Messrs. Cassell & Co., as they did not feel at all sure until the fourth year that the magazine was going to live.—Yours truly,

HARRY HEMS.

WORKMEN'S DWELLINGS AT BRISTOL.

WORKMEN'S dwellings are being erected at Bristol, in accordance with the requirements of the Local Government Board, for the purpose of re-housing those persons whose dwellings have been pulled down under various schemes of street improvement. Four sites have been selected, all in densely-populated districts, and sixty dwellings are in course of erection. The dwellings are divided into two classes; a first-class house contains a living-room 14ft. by 13ft. 10in. by 8ft. 6in.; two bedrooms, average size respectively 14ft. by 8ft. by 8ft. 6in., and 9ft. 3in. by 9ft. by 8ft. 6in.; washhouse, 8ft. by 4ft. 6in. by 8ft. 6in. Maximum number of persons, five. The second-class houses contain living-rooms, 14ft. by 13ft. by 8ft. 6in.; bedrooms, 12ft. by 9ft. 6in. by 8ft. 6in.; washhouse, 8ft. by 4ft. 6in. by 8ft. 6in. Maximum number of persons, three. The following are the sites upon which the various dwellings are being erected: Chapel Street, St. Philip's, fourteen first class, ten second class; Bragg's Lane, St. Jude's, six first class, four second class; Millpond Street, Baptist Mills, sixteen first class, four second class; Mina Road, two first class, four second class. The buildings are of red bricks, and the roofs are covered with double Roman tiles. The tenements are built in pairs, one situated on the ground floor and the other on the first floor. Those on the ground floor are approached direct from the street, but those on the first floor from an iron verandah 3ft. wide, which runs the whole length of the building and is reached from the street by a wide open fireproof staircase. The living-rooms are well lighted and provided with an open kitchen grate with oven. Each bedroom has a fireplace fitted with a mantel register grate. In the washhouse is a boiler and small coal cupboard. The floors are of cement-concrete floated up to a smooth face. The dwellings on the ground floor have a back as well as a front entrance, but those above can only be approached from the verandah before referred to. At the back of each block of tenements is a spacious yard laid with tar paving and is available for the use of all persons occupying the dwellings. Galvanised iron ash-bins are provided for general use. The drainage of the buildings has received special attention, and each pair of tenements has an intercepting chamber between it and the main drain. The drains are ventilated throughout.

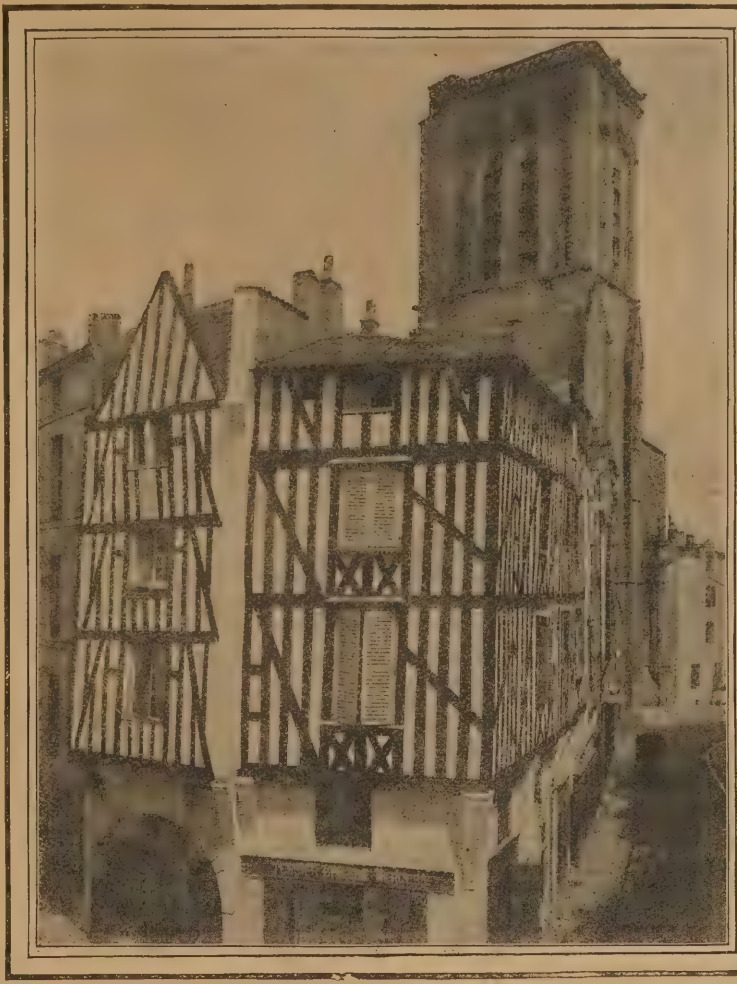


FIG. 6.—A FIFTEENTH-CENTURY HOUSE AT LA ROCHELLE.

Views & Reviews.

Oblique Bridges.

Oblique bridges are now of almost everyday occurrence in railway design, but they nevertheless still cause problems of considerable complexity and difficulty, for in no class of structure is accuracy of detail of greater importance; an error apparently insignificant at the commencement of the work increases as it progresses, until the stability of the arch is materially affected. The important feature in the construction of an oblique arch is the form of the beds which divide the courses of brick or stone of which it is built up. In an ordinary square arch the coursing beds are all plane surfaces, which have their sides parallel to the axis of the arch, but in an oblique arch the coursing beds are spiral surfaces, which wind around the axis of the arch, and the joints in the faces of the arch are not square to the coursing joints. Of course various parts of the arch can be determined geometrically by projections and developments from the plans and elevations, but as these are necessarily drawn to a comparatively small scale all the dimensions should be calculated from the ascertained properties of triangles and surfaces. Mr. Campin describes in a most lucid manner two methods of making these calculations: in one of them trigonometrical equations are employed, which is the more elegant, and in the other the result is obtained from the properties of right-angled triangles. Such scientific methods are now being increasingly employed in masonry; and if they are adopted, full working drawings being prepared, there is no reason why the voussoirs, coursing and other stones should not be wrought in the quarry ready for fixing as soon as they come on the job. The book should be read by anyone possessing a knowledge of mathematics as an example of modern methods of stone-cutting and the best methods of exact scientific engineering; it is, moreover, a good model of what a contribution to one branch of work should be—concise and free from extraneous matter.

"A theoretical and practical treatise on Oblique Bridges in Stone and Brick." By Francis Campin. London: The Publishers of the "Railway Engineer," 3, Ludgate Circus Buildings, E.C.

A Timber Ready-Reckoner.

Hall's Ready-Reckoner gives at a glance the superficial contents in feet, inches, and parts, of boards, deals, battens, &c., ranging from 1ft. by ½in. to 50ft. by 3ft. The calculations have been carefully made, and will no doubt be widely appreciated by all those engaged in timber transactions, such as the checking and making-out of invoices, &c. Tables like these, arranged to facilitate instant reference, are somewhat scarce in branches of trade particular to the building industry, and the compilers of these handy works deserve every support, as without such tables in an office constant repetition and mental labour of a wearisome and unedifying character are entailed, or else there is a needless waste of time incurred in preparing them.

"Hall's Superficial Ready Reckoner for Boards, Deals, Battens, &c." Compiled by Robert Hall, Builders' Surveyor, of Bury. Price 1s. nett. Bury: "Times" General Printing Works, 2, Cross Street; London: E. & F. N. Spon, Ltd., 125, Strand, W.C.; Manchester: John Heywood and A. Heywood & Son.

The New Loges in the Ecole des Beaux-Arts at Paris to be used by the competitors for the Prix de Rome are almost finished, and the walls are about to be whitewashed on which many interesting sketches are drawn, among them being a spirited cavalier by Regnault, the famous battle painter. The students wish these souvenirs to be preserved, and they have petitioned M. Dubois, director of the School of the Beaux-Arts, to command the workmen not to obliterate the precious *croquis*.

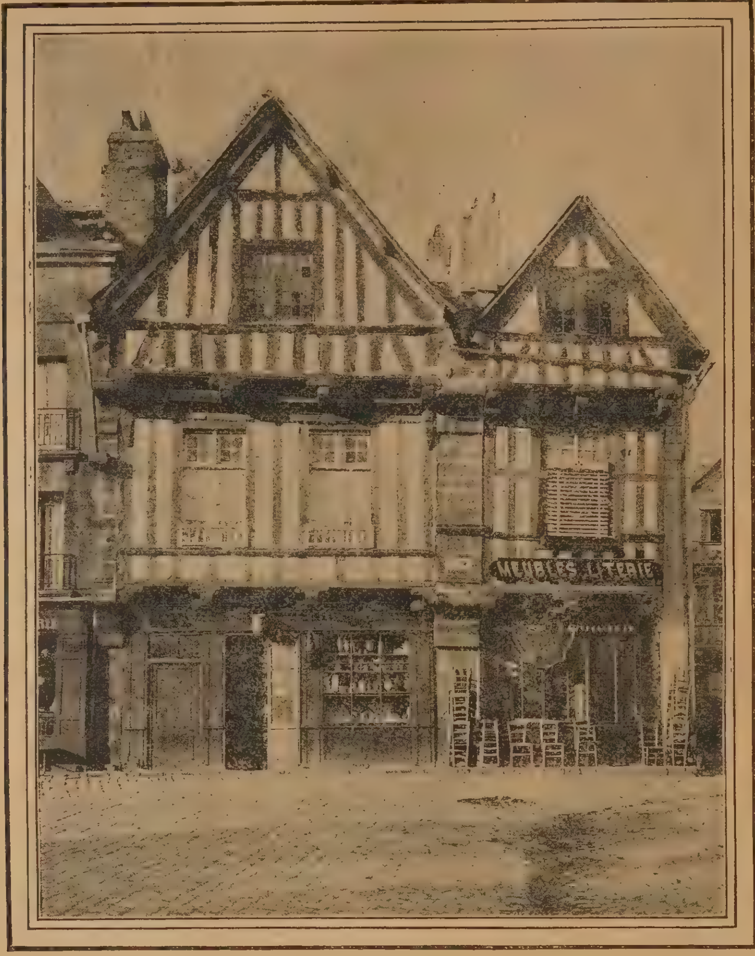


FIG. 7.—WOODEN HOUSES, PLACE DE LA MAIRIE, AURAY.

A NEW CHURCH IN LAMBETH.

THE United Methodist Free Church and Schools, &c., Fentiman Road, South Lambeth, S.W., were opened recently. The buildings are designed in Perpendicular Gothic, freely treated. The facings are of red bricks and the dressings of Bath stone. The roofs are covered with green slates. The church, school and church-parlour gables all face Fentiman Road; the school, however, is well set back to give prominence to the church. A bold square tower containing an angle entrance and staircase to a small end gallery stands at the corner, and is terminated by a small lead-dressed spirelet and vane. An octagonal narthex is a feature in front, and this contains the two main entrance doors to the church, which consists of nave, transepts and apse with side organ chamber, opening by arches into both apse and church. Accommodation for the choir is provided in the apse. A richly-traceried and carved stone-pulpit and dwarf screen on either side extend across the apse. A large platform, with oak Communion table and chairs, is placed in front of the pulpit and is surrounded by an oak handrail, supported by carved oak newels and wrought-iron and copper standards. The seating is circular on plan. The apse arch is in moulded Bath stone, supported by shafts with carved caps. The transept arches are carried on dwarf bellied Irish green marble columns with stone caps and corbel bases. The accommodation is for about 650 persons. A large schoolroom (which is arranged to be divided off into a number of classrooms) with gallery around with wrought-iron girdle front is provided, and also church parlour, vestry, ladies' working-room, library, infants'-room, kitchen, with commodious lavatories, &c. The door furniture is of hammered copper. The whole of the block is lighted by electricity, the fittings being of wrought-iron and copper work. A low-pressure hot-water heating system has been adopted. The entire block has cost about £7,000. Mr. J. O. Richardson, of Albert Works, Peckham, S.E., was the builder, and Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clement's Inn, Strand, W.C., were the architects.

THE CHANGE AT RICHMOND.

TIME was, not more than eleven years ago, when the river below Teddington and from Richmond down to Wandsworth was, at low water, a sight to be shunned. Seen from Richmond Hill the view was poetical enough, but those on the river-banks saw that what there was of the stream at low water barely trickled through mud banks to hang sluggishly in pools. Old Richmond Bridge, built in 1777, looked complacently on all this for a century and a quarter. But a new bridge was to come. Richmond Borough Council obtained powers and £40,000; the Thames Conservancy contributed £20,000 more; and the two bodies built a foot-bridge lower down the river, with the South-Western Railway Bridge between the two. Deftly inserted in slides of the foot-bridge were sluices, which would hold up the stream at low water far enough to ensure the beauty and the utility for pleasure purposes at least of this part of the Thames at Richmond.

Naturally enough, the communities lower down the stream opposed the Bill for the new sluices, not so much on the ground that Richmond would be made more beautiful as that their towns might suffer from drought. As a matter of fact, though Richmond has been brightened, the towns below are little, if any, worse off than before; save, possibly, Kew on the one side and Isleworth on the other. Nevertheless, they all gathered representatives together from Brentford to Wandsworth, on the initiation of Hammersmith, to plan a scheme for fixing another weir below Wandsworth Bridge, in the borough of Battersea. Mr. Pritchard, C.E., estimated the cost at £220,000. The London County Council was approached, but declined to receive a deputation, and since the death of Mr. Pritchard the project has hung fire. Wandsworth and one or two more boroughs were not exactly hostile, but were indisposed to enter on the scheme. Hammersmith has further mooted in committee of Council a suggestion for a towing-path or footpath in their district along the Middlesex bank of the Thames similar to that on the Surrey side, but there, again, the cost renders the scheme all but hopeless unless the London County Council steps in.

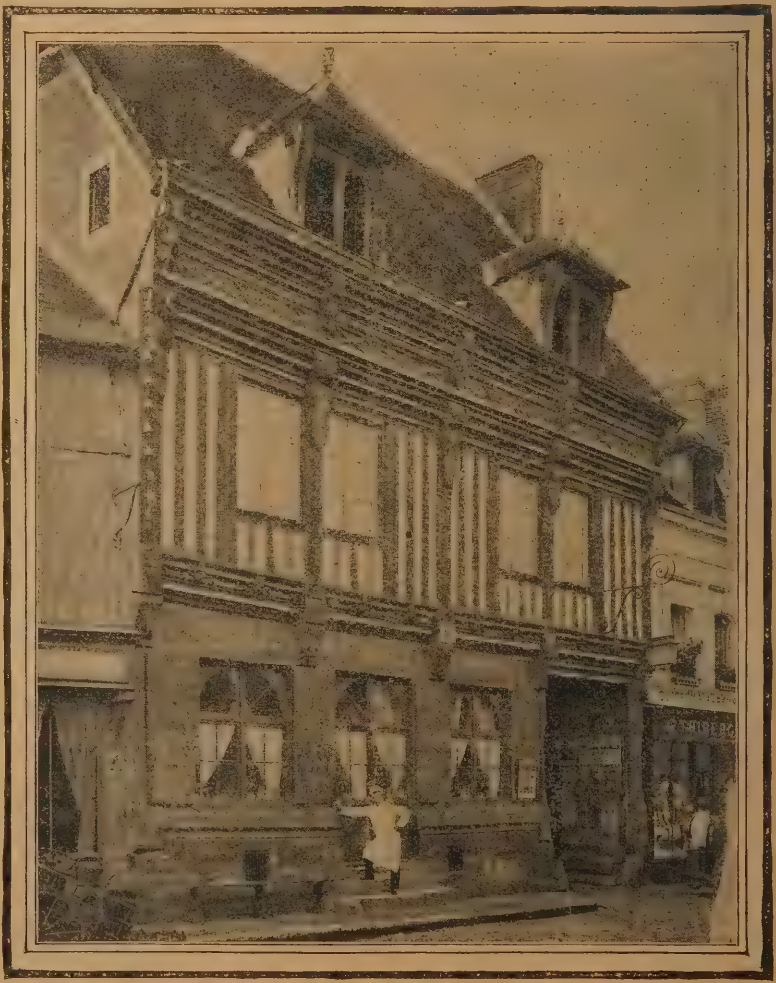


FIG. 8.—WOODEN HOUSES AT LES ANDELYS.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Lead Flat, Protection of Walls from Damp, and Hanging Sashes.

HARRINGAY.—W. A. B. writes: "(1) I have a flat to construct about 40ft. by 40ft., to be covered with lead, but I want the rooms under it to be cool. Which would be the best method of obtaining this? I thought of putting joists on and boarding, and then putting smaller joists on top leaving a 3in. cavity between, and then boarding again and covering with felt. (2) I am putting up a house in an exposed position and do not want to use hollow walls. Should I plug and batten the outer walls and then lath and plaster in the usual way? If so, what sizes should the timbers and the cavity be and what distance apart? (3) I have some sashes (double hung) 2ft. wide by 7ft. 6in. high (total from stone sill to soffit). Would sufficient room in the frames be obtained with stone mullions 5in. wide for both the lights to be hung if I used lead weights, or should I have to make them larger?"

(1) Your plan is a good one. The cavity should be ventilated and slag wool would be an effectual preventive of vermin. (2) Yes. The battens used are 2½in. by ¾in. or 2½in. by 1in. They should not be less in thickness, as a ⅜in. cavity at least should be left. The battens are nailed to the plugs and spaced a foot or less apart; a greater distance is not advisable on account of weakness. The laths are spaced about ⅜in. apart. Lath and half laths should be used for walls subject to rough usage, and single laths for ordinary walls. Battened walls harbour vermin, their woodwork is likely to decay, and they are in danger of fire. The bottom lath should be left off till the last and the wall plastered from the top downwards so as to allow the plaster that falls through the laths to have a free passage and not lodge on any of the protuberances inside the cavity from plaster below or at the bottom of the wall, as this will lead damp through. Metal lathing is now much used and has advantages. Vertical tiling is superior to plastering. (3) You do not assist us to give you a correct answer; the details you give are meagre and ambiguous, and the weights of the sashes, a most important consideration, are not stated. A space 5in. wide by about 5in. deep is exceedingly small for four weights to hang in, and therefore every fraction of an inch must be studied. You cannot have stiles less than ⅞in. thick, and the centre lining must be kept as thin as possible, say ⅛in. This will allow room for a square lead weight about 2in. by 1½in. and about 12in. long. In this we are working upon the assumption that the glass will not be heavier than 21oz. sheet. If plate glass is required, "patent" had better be used to reduce the weight. If this is done you will have sufficient room by using lead weights, as you can counterbalance a sash up to 30lbs. weight without having the weights too long to enable them to work. We assume that the sashes are about 3ft. 6in. by 2ft. each.

"New" Buildings and Rights of Lights.

DULVERSTON.—EXE writes: "Two houses have been purchased by private subscription and pulled down. That part of the site denoted by the dotted lines on the enclosed sketch (not reproduced) has been thrown into the street, and the part shown by the firm lines is now for sale. (1) Would a house erected on the site be a 'new domestic building' within the meaning of the by-laws, of which I send a copy; and (2) how long is a right of light retained after a building to which that right belonged is demolished?"

(1) Yes, it would be a new building within the meaning of the by-laws. (2) To maintain any "ancient lights" or rights of light which have been acquired by prescription, care should be taken before pulling down the building that detailed drawings, with full particulars relating to the size and exact situation of the "ancient lights," are properly prepared, signed and verified, or the old windows should be temporarily maintained in their original position. If the building has been pulled down and no duly authenticated records kept of any presciptive rights of light which were previously obtained, it would appear they have been voluntarily relinquished, so that any attempt now made to restore them more or less approximately might be successfully disputed.

T. E. C.

Rainwater Tanks.

NORWICH.—C. B. writes: "I have just completed a rainwater tank, of about 5,000 gallons capacity and 6ft. deep, in a boggy soil partly under water. The walls consist of Fletton bricks laid in Francis & Co.'s Portland cement and pugged round with 12in. of gault. The walls were then rendered, which rendering remained perfectly sound for about a month, since when it has left the walls in pieces varying in size from 1ft. to 6ft. super. Can you suggest a remedy?"

The chief reason is doubtless that the cement rendering had not a sufficient key to hold it on. Fletton bricks are comparatively smooth, and might with advantage have their faces scoured, but the most important consideration is that the joints should be raked out before rendering; the smooth flushed joints in cement gave no hold. The want of key would be aggravated by the bricks not being thoroughly wetted before rendering to prevent the water being abstracted from the cement.

Books on Repoussé Work.

INGATESTONE.—R. H. B. writes: "Where can I obtain a cheap book on the rudiments of repoussé work in copper or brass?"

Gawthorp's "Art of Brass Repoussé for Amateurs," price 1s. (B. T. Batsford), and "Repoussé and Metal Chasing," by C. G. Leland, 6d. (Dawbarn & Ward, 6, Farringdon Avenue, E.C.), are the only books we know of on this subject.

Discoloured Plastering on Walls.

NORWICH.—E. P. R. writes: "Which is the best way to treat a newly-plastered (internal) wall on which the plaster is much discoloured, apparently by the bricks? Neither paint nor ordinary colour will cover the defect."

The discoloration may be due to several causes, but we should hardly blame the bricks. It may be caused either by the composition of the backing or of the setting coat, by the floating having been brought up in one coat, or because there was insufficient thickness in the coats. Two or more of these may have united in discolouring the surface. The only remedy is to replaster, using good materials and in three coats—described as render, float and set.

Charges for Quantities and Supervision.

TODMORDEN.—NEMO writes: "I agreed with a working joiner to build four houses. He was to buy some plans (that had already been drawn) from an architect who is also the agent for the land. The joiner was also to get out the quantities for the materials required, which he could easily do by simply doubling the quantities of two houses he had previously built. He has added 1½ per cent. for the quantities on to the cost of the houses and charged me £10 per house for his superintendence. Is this fair? The houses have cost £222 each."

We do not think, considering the circumstances, that the contractor is entitled to more than £5 per house for superintendence and £10 for the preparation of quantities and obtaining estimates.

Changing a Private House into a Shop.

SANDWICH.—D. E. R. A. writes: "I have a private house which I want to alter into a shop. My next-door neighbour has a small cellar which is built out into my basement, the ceiling being formed by my ground-floor joists. The wall forming the cellar has a wooden shutter, also a bond timber. As I wish to make this fireproof, and also to lower the ground floor about 9in., can I remove my joists and floor and put in a fireproof floor over the cellar (the underside would come about 2in. lower than the present ceiling), and should I have to give notice of my intention of doing this? Also, can I take out the wood shutter, &c., and fill in with brickwork? I might add that my neighbour is not on good terms with me."

The floor is virtually a party wall, and you should certainly give notice, more especially as we cannot see how you can avoid entering your neighbour's cellar and causing a nuisance in the replacing of the floor. As you are not on good terms, we should advise you to adopt some method by which you would avoid any interference with your neighbour's headroom: 2in. is not a great matter, after all. You must certainly get permission to alter the wood shutter, &c. Your neighbour might legitimately object to the opening being blocked up with brickwork, for we presume the two premises were originally intended to form one, and he may be desirous at some time or other of acquiring yours; but if he is at all reasonable he could hardly object to an iron door being put in.

The Specific Objects of these "Enquiries Answered."

KING'S NORTON.—F. E. T. writes asking us to give answers to examination questions dealing respectively with the safe weight to put on timber struts; plans and sections of cast-iron columns; and stanchions to carry given weights.

In reply we have to say that these columns are not intended for the purpose of answering questions set as exercises in books or in examinations, nor to save correspondents any little trouble they may experience in endeavouring to solve problems with which they have very little acquaintance; our object is to aid readers in real problems which may occur in the course of practice. At the same time, we are always willing to help any student over a rough road. Our correspondent can find all he needs in Rivington's "Building Construction" and Prof. Henry Adams's "Structural Ironwork" (price 7s.). The formulæ for calculating the sizes, &c., of struts, beams, &c., are given shortly and clearly, with tables of the values of the constants, in Hurst's "Architectural Surveyors' Handbook" (price 4s.).

An Architect's Liabilities.

ENQUIRER writes: "I have been carrying out some alterations for a public body, at a cost of about £400. Early in July I sent certificates in final settlement. The clerk did not call a meeting of the governing body till September; and although I asked him to allow me to attend the meeting, he sent me no notice. Since then he has requested me to produce a statement of account, vouchers and bills, which I have done. I may add that the bill of extras amounts to less than £10. I have given orders personally for special things, and have therefore made myself personally liable for them, and am now being pressed for payment. I have informed the clerk that I shall give no further information unless I can meet the whole governing body."

It is difficult to understand how you can be personally liable. If you have been acting as architect you were, *ipso facto*, entitled to order reasonable extras and variations, and the body for which you acted is bound to pay on your certificate. The only likely complication is that the contract may not be under the seal of the public body, in which case it may repudiate liability entirely; but then the contractor and not the architect would be the loser, the architect being no party to the contract. The best course to adopt seems to be to take up this position, leaving the contractor if necessary to issue a writ against the governing body upon your certificate, while repudiating personal liability yourself. If there are any other material facts, a local solicitor should be consulted, to whom the matter could be explained personally.

G. A. T. M.

Vandalic Restoration at Heidelberg.—The appearance of the castle has been quite spoilt by "restoration." Before, it was of sandstone that had turned a deep rich red with age. Now the old front has been taken out and the former stones faithfully copied, but the effect is like a house in the Champs Elysées newly built for a stockbroker, and copied from an old Renaissance house. From the river it looks like a mammoth *hotel de luxe*, for a blue slate roof and gilded cupolas have been put on it.

THE HOUSING PROBLEM.

CONFERENCE IN GLASGOW.

A CONFERENCE under the auspices of the Improvements Department of the Glasgow Corporation was held last week at Glasgow. The Lord Provost (Mr. Samuel Chisholm, LL D.) presided.

Preceptor Gray (Glasgow) read a paper giving suggestions as to the means of acquiring at the lowest possible cost the land necessary for the erection of cheap dwellings and obtaining the capital required for the purchase of the land and the erection of the buildings. He argued that municipalities should have power to call upon owners of slum property to clear the land of what he would call diseased property. Local authorities, when securing land for parks and other public purposes, should see that it was secured untrammelled with restrictions against building. On the border of our large towns there were tracts of land held by hereditary and other landowners who were waiting until the trade of the city increased the value ten- or twenty-fold. It was high time powers were obtained to force the necessary ground into the market.

Councillor Burt (Glasgow) followed with a plea for the taxation of land values.

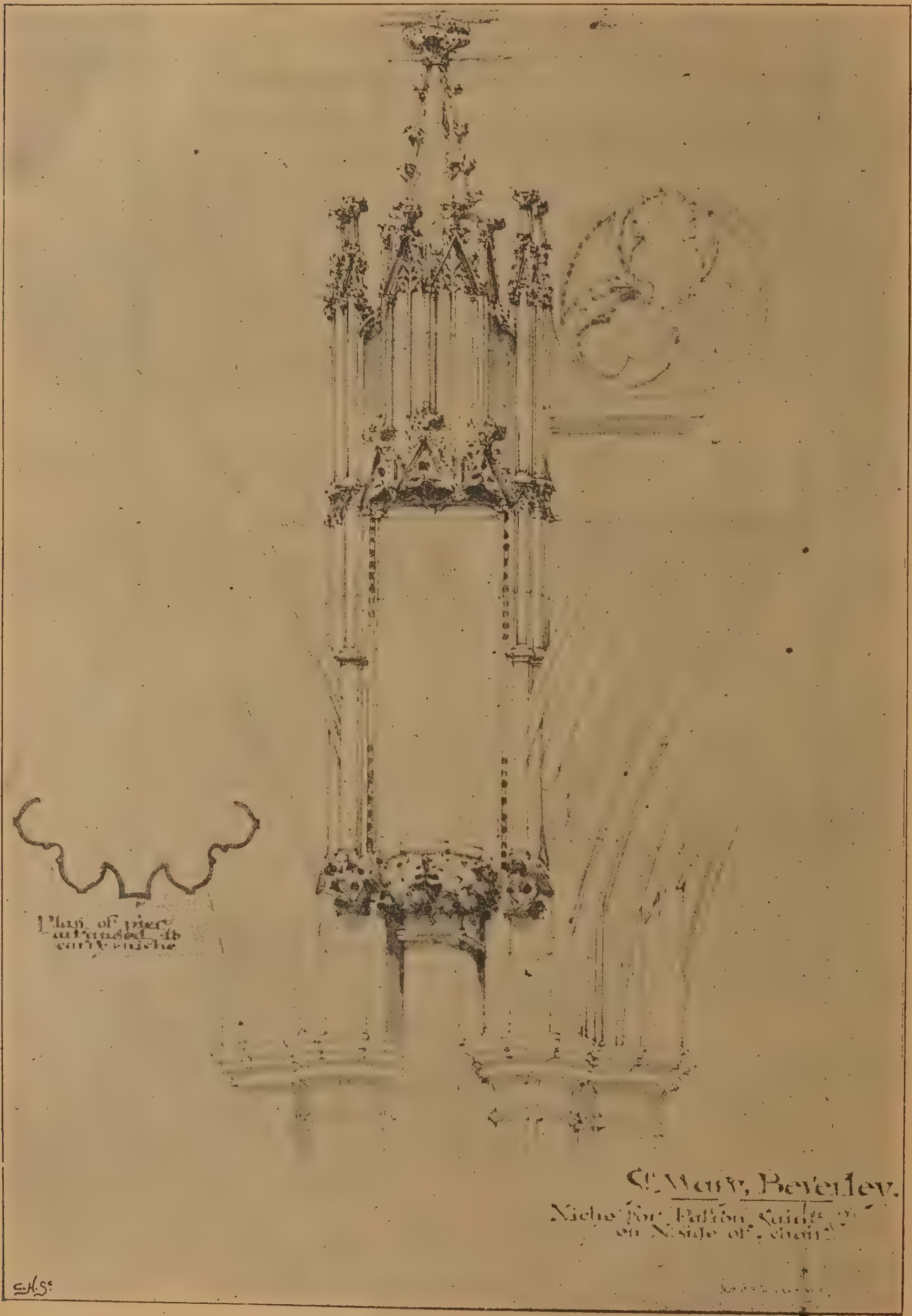
Mr. A. B. M'Donald, city engineer, Glasgow, read a paper on the materials usable for, and the various feasible modes of construction in, the erection of suitable dwellings, and sketched out a scheme for a tenement of houses 60ft. in length and three storeys in height at a cost of £1,100, thus allowing them to rent houses of one room at 1s. per week. That would yield £78 per annum. The extent of ground required would be 630 sq. yds., including proportion of street ground in front. Writing off the rentals 25 per cent., and charging 3½ per cent. on the cost of erection, would allow 10s. the sq. yd. for the site. He stated that there were localities in Glasgow not far removed from industrial centres where land could be obtained for less than 10s. per sq. yd.

Councillor Walker (Leeds) suggested that municipalities should be allowed to pay a ground rent for the land instead of repaying it over a term of years; that instead of attempting to build according to the regulations of the Local Government Board they should be allowed to put up inexpensive buildings; and that they should extend the term of repayment over fifty or sixty years.

The best possible way to deal with unhealthy and congested areas from the point of view of economy, expediency and sanitation was dealt with by Councillor Holder (Hull) and Councillor Innes (Derby). The former urged that the demolition of insanitary areas should be taken under the second part of Part 2 of the Housing of the Working Classes Act. He pointed out that Part 1, which dealt with large areas, was very costly; but Part 2, which dealt with one house at a time, entailed little expense, and the work could be carried out with expedition, advantage and economy. Mr. Holder, in reply to a question as to what Hull did for the people displaced by the operations of the Act, said a private company erected houses of four rooms, which they let for 3s. 9d. per week or offered for sale at £130 freehold. The price of the land was 10s. per sq. yd. The houses were in some cases less than a mile from the centre of the city. There was no ground rent, and being operated by a private company the scheme was not harassed by preliminary objections raised by the Local Government Board, as would be the case were it carried out by the Corporation. It had been found of great utility for the housing of those persons displaced by the operations of the Hull city improvement scheme.

Mr. Peter Fyfe, chief sanitary inspector of Glasgow, read a paper on "Farmed Outhouses: Should Municipal Authorities provide them?" and he took the view that municipalities should not supply furnished houses on the ground that only a limited number of the sub-tenants were victims of circumstances not of their own making. The remedy, he held, was the annihilation of the unrestricted use of public-houses and lower class pawnshops.

A resolution was adopted that further and immediate general or private Bill legislation was necessary and expedient in the directions following: (*a*) That simpler and less costly machinery should be devised and sanctioned by Parliament for enabling local authorities to put in force and carry out the provisions of the Housing of the Working Classes Acts; (*b*) that authority should be given to municipal corporations and other local authorities to acquire at its market value, by as simple and inexpensive a method as possible, and without any allowance for compulsory purchase, land for the present or prospective erection and maintenance of dwellings for the population to be displaced by the abolition of slum properties; (*c*) that any sinking fund required to be set apart for repayment of moneys borrowed for such purposes should apply to the cost of buildings only, and not to land, and should be extended over a period of not less than sixty years; and (*d*) that municipal corporations and other local authorities be empowered to build such buildings in accordance with their own by-laws and not be required to satisfy the requirements of the Local Government Board.


Plan of pier attached to carry niche
St Mary, Beverley.
Niche for Patron Saint on N side of chancel
C.H.S.

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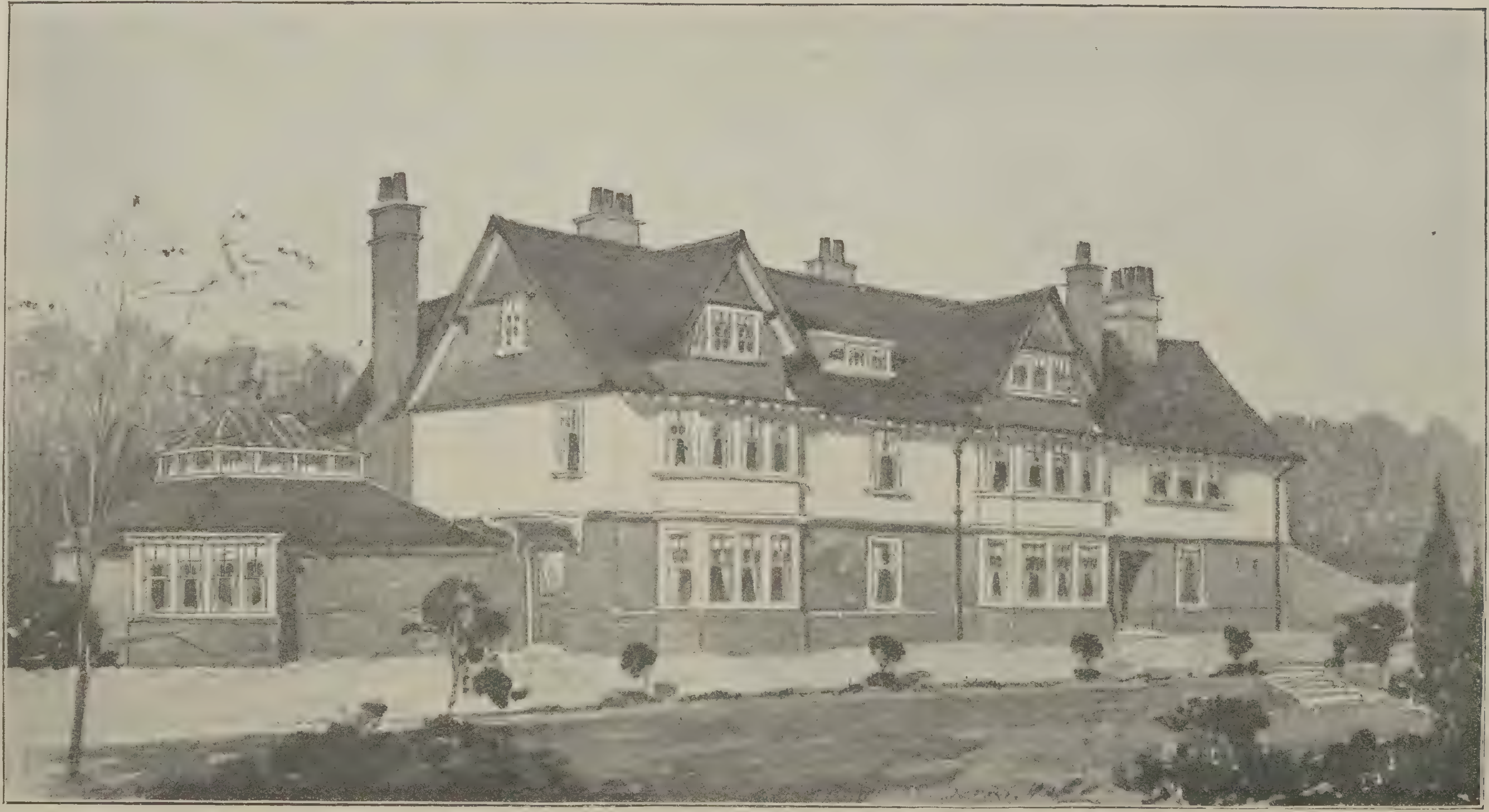
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, October 2nd, 1901.



HOUSE AT WARLINGHAM, SURREY. W. H. Atkin Berry, Architect.

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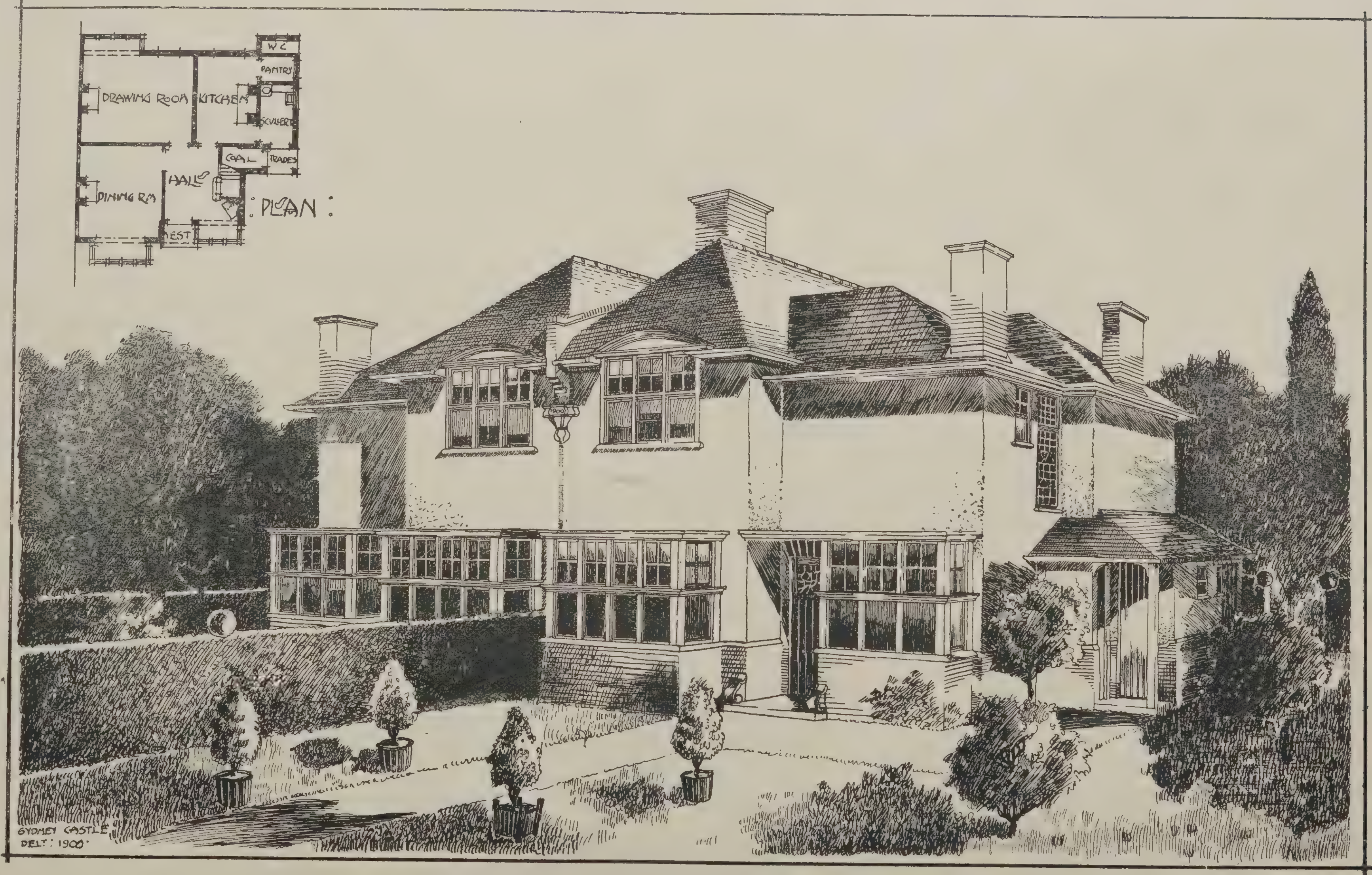

HOUSES, DITTON ROAD, SURBITON. A. J. HARDWICK, Architect.

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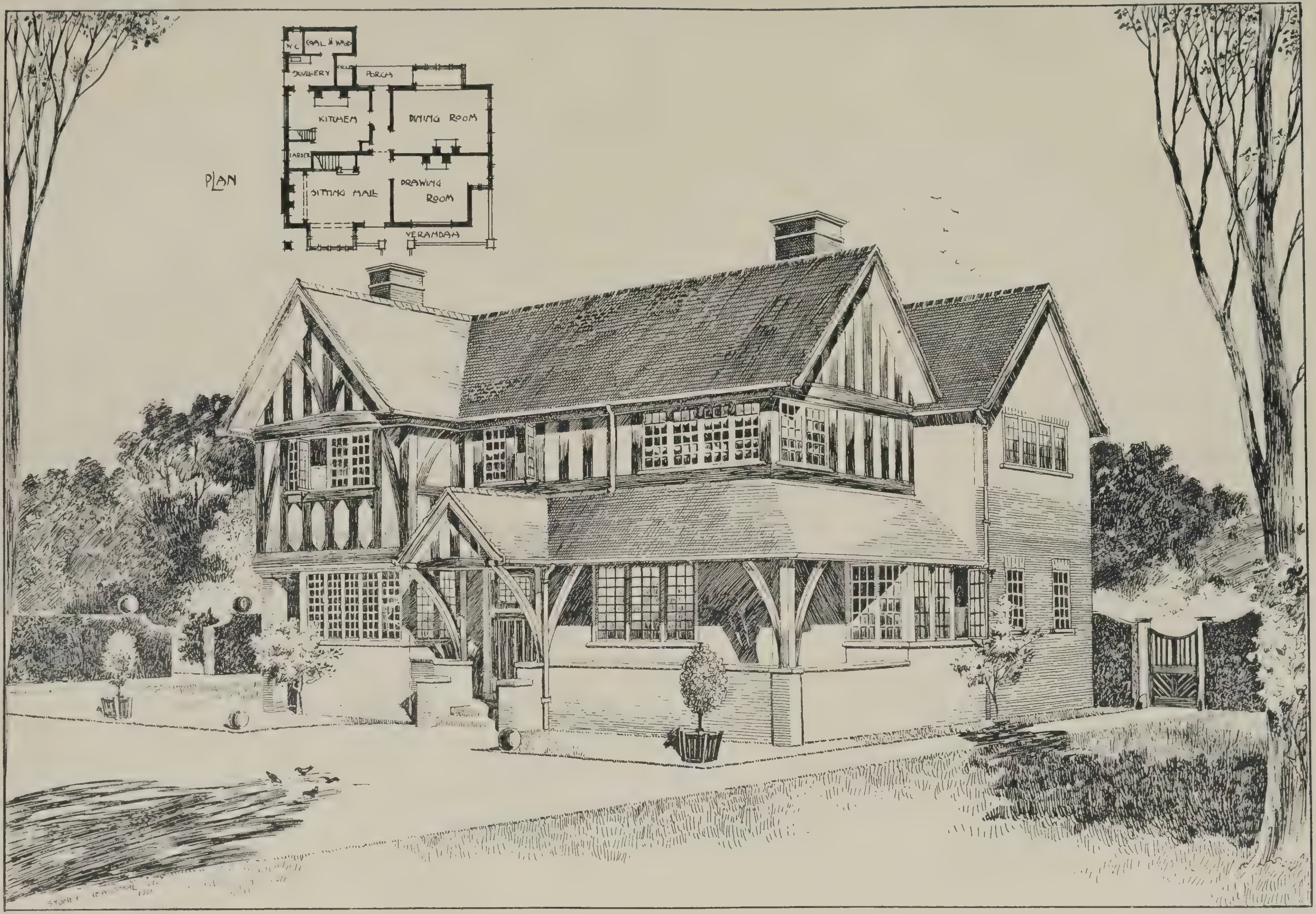

HOUSE AT ROEHAMPTON. A. J. HARDWICK, Architect.

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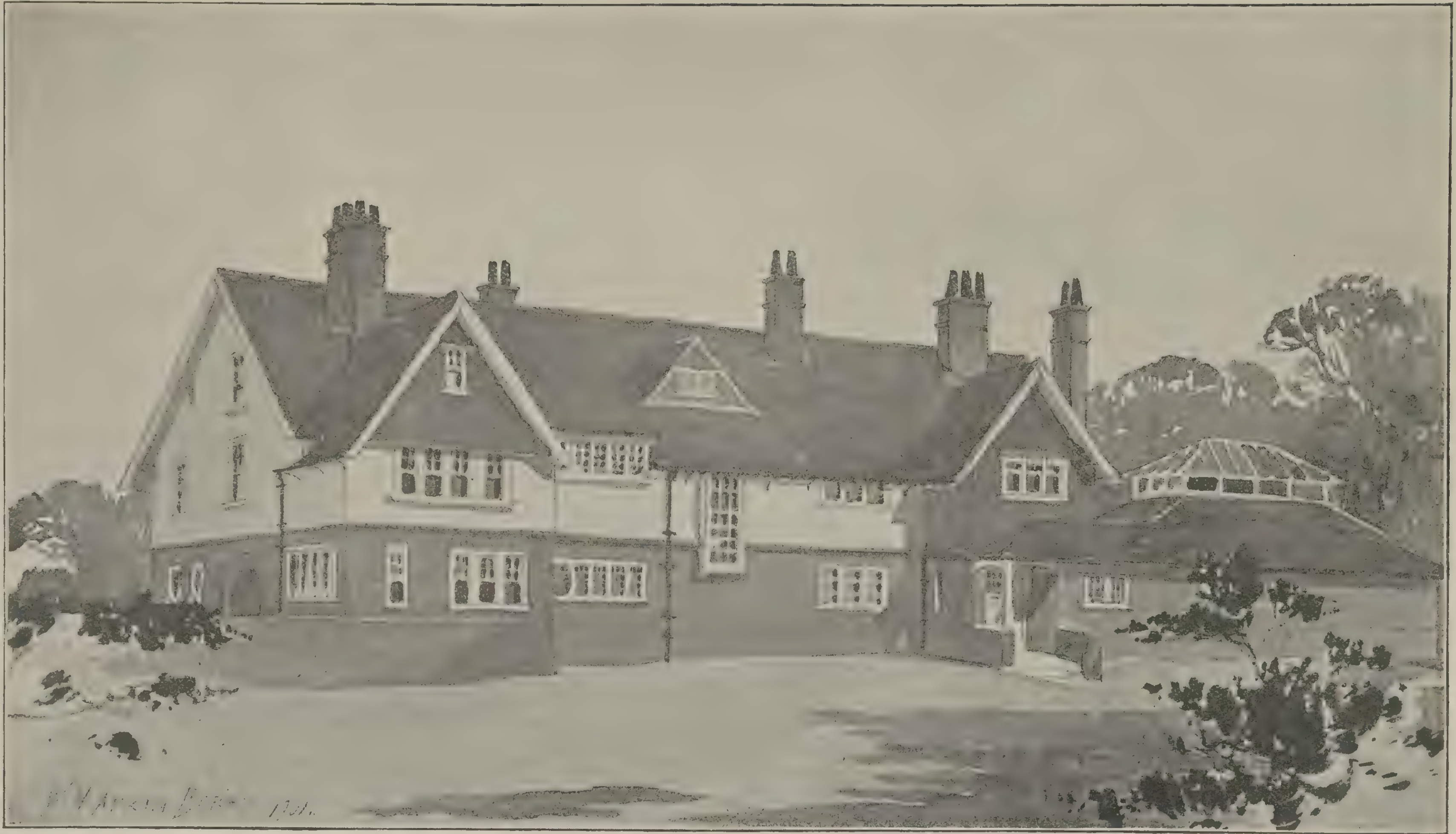

HOUSE AT WARLINGHAM, SURREY. W. H. Atkin Berry, Architect.

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Builders' Notes.

Disclosure of Tenders.—At the recent monthly meeting of the Norton (Malton) Urban District Council letters were read from Messrs. A. Lyons & T. Anderson, builders, of Norton, who complained of the Council's action in rejecting their tenders for the erection of the public swimming bath because they were higher than the surveyor's estimate. Mr. Lyons alleged that the committee or the officials had disclosed the details of his tender to other tradesmen, which was a scandalous thing.

Leeds Glazed Bricks.—The manufacture of glazed bricks, which already ranks as an important Leeds industry, is steadily growing in importance. High-class bricks are now turned out in immense quantity at the Farnley Ironworks and other local seats of manufacture. Owing to the excessively refractory character of the Leeds clay, the hard glaze can be put on at a temperature much above that which most clays can stand, and as a consequence the glaze is of an exceptionally durable character. The employment of glazed bricks is constantly on the increase. Numerous large buildings, public and private, are being erected in Leeds at the present moment, in the masonry of which they will form a conspicuous feature, but London is the best market. Leeds bricks are exported in considerable quantity to France, Germany and other Continental countries, but their great weight makes the question of carriage prohibitive to places such as the colonies. Were Leeds a seaport the difficulty would be greatly lessened.

The "Canadian Trade Index" is the title of a useful publication which has been prepared by the secretary of the Canadian Manufacturers' Association, Toronto, for the use of British, French and Spanish importers. The "Index" contains the names of some 800 leading manufacturers of Canada, who have formed themselves into a voluntary association for the purpose of advancing the trading interests of the country. It also contains a brief sketch of the leading export manufactures of Canada. Then follows an alphabetical list of the members of the association, together with a limited list of the articles made by them. The third part contains an alphabetical list of the articles produced by the various members, under which appear the names of the manufacturers of each. The names of the articles are given in English, French and Spanish. Mr. W. D. Scott, Commissioner of the Canadian section, Glasgow Exhibition, will be glad to furnish a copy of this book free of charge to merchants interested in Canadian manufactures, and also offers to answer any enquiries relative to goods that may not be specified in this publication.

Encroaching on Regent's Park.—Lord Howard de Walden has laid a proposal before the London County Council and the Marylebone Borough Council which, it is stated, if carried out will involve a serious diminution of the air and space on the north side of Regent's Park. His lordship is improving that portion of his estate called Portland Town, which abuts on the north-west side of Regent's Park. He asks to be allowed to advance the building line on the fore-courts in Albert Road from High Street (St. John's Wood) to Culworth Street to an extent varying from 10ft. to 26ft. on an average of 15ft., and it is understood that, should this be granted, a further demand will be made to continue the encroachment for a long distance further in the direction of Primrose Hill. The object in view is that there may be more room for the erection of blocks of residential flats in Albert Road overlooking Regent's Park. This scheme will take a large slice off the width of Albert Road, which, in its present state, is capable of being converted into a magnificent boulevard, and will cause a serious diminution of the amenities of the park. This proposal has unfortunately received the approval of the works committee of the Marylebone Borough Council. It is being vigorously opposed by a portion of the London County Council. It is a melancholy fact that notwithstanding the object-lesson we have had in the destruction of the beauty of Euston Road and Marylebone Road by encroachment on the forecourts, we should now have to defend another of our boulevards from the building speculator.

Masters and Men.

The Bricklayers and Labourers of Hinckley, Leicestershire, have asked their employers to be allowed to resume work on the old terms. On April 1st they came out for an advance in wages, and have remained on strike ever since.

The Strike of Painters in Salford, which took place in connection with the work at the Salford Car Shed recently, still continues. The contract for the painting of the shed was let to a couple of firms, one of whom, so the Union allege, employed unskilled workmen to do what might be termed rough work—work which the firm contend is not that which skilled men are called upon to perform. The Painters' Union, in the face of this, say that even if these men were receiving the standard rate of wages fixed by the union, this firm would still be breaking the fair contracts' clause, the contention being that whether the work be rough or smooth it should be done by skilled painters.

The Strike of Builders' Labourers at Swansea has for twenty-one weeks been carried on with good feeling on both sides, but there are now indications that feelings other than pleasant are becoming pronounced. A considerable number of labourers have been brought to the town, but strikers are said to have got at many of them, and the feeling of some of the employers is that this has been brought about by illegal methods. The employers declare that if the labourers who offer their services are much further interfered with they will bring to a close all work now going on in Swansea until next spring. This, of course, would mean the locking out of masons, carpenters, and practically all engaged in the Swansea building trade for the whole of the winter. They also have issued an intimation that if the builders' labourers persist in picketing they will apply for an injunction and also claim damages under the recent Taff Vale picketing case decision. The strike has cost the union £1,800, and the masters have lost over £3,000.

Hull Slaters' Strike.—The Yorkshire District Branch of the National Association of Slate Merchants and Slaters held a meeting last week at Leeds to consider the Hull slaters' dispute. The operative slaters of Hull, who are members of the Yorkshire Division of the Slaters' and Tilers' Amalgamation, have been on strike for five weeks against a code of working rules recently agreed to between the employers and the operatives in Yorkshire, and have defied the authority of their Executive Committee. In consequence of the interference by the Hull Operative Building Trades' Federation, the Hull employers, who so far have taken a neutral position in the struggle, appealed to the Yorkshire employers for advice. It appears that rule 8—the one with regard to labourers, and which the Hull men declared to be the bone of contention—was submitted by the operatives themselves and was struck out of the code by the masters at the first conference between the employers and the operatives. At the second conference the operatives insisted on the rule being reinstated, and after a discussion the masters gave way on the point. Thus it would be seen that the rule in question, and upon which the dispute now largely rested, was forced upon the employers against their desire. The meeting was unanimous in its determination to support the action of the Hull employers. Amongst the resolutions passed were the following: (*a*) That this meeting regrets and condemns the action of the Hull branch of the Yorkshire District of the Operatives' Amalgamation, and hereby pledges the Yorkshire employers to "back-up" and assist in every possible way—both morally and financially—the Hull members of the association in securing the due observance of the new code of working rules. (*b*) That a fund be raised for defraying the expenses that may be incurred in connection with the Hull slaters' strike, and that, as a first instalment to such fund, a levy be now made of 10s. per man for each operative slater employed by the slating and tiling contractors of Yorkshire; and that application be made to the National Association of Slate Merchants and Slaters for the interim grant of £260 from its "emergency" fund. (*c*) That the hon. secretary be instructed to advertise for unionist slaters at the standard wages of the city and that, in addition, the Hull employers be authorised to give approved workmen a substantial bonus until the termination of the dispute.

New Patents.

These patents are open to opposition until November 4th.

1900.—Sewage Wagons.—15,781. W. Defries, 147, Houndsditch, and V. I. Feeny, 60, Queen Victoria Street, London. This invention relates to sewage wagons which consist of wheeled tanks into which the sewage is lifted by means of a vacuum. Offence may be caused by such wagons becoming full without the operator being aware of the fact. To prevent this a floating indicator in a glass dome is provided, which shows when a given level has been reached.

Closing Apparatus for Lift Doors.—16,962. A. C. Moffatt, 32, Green Street, Blackfriars, London. In the well-hole at each floor-level there are two chain-wheels having projecting arms. These wheels are connected with a shaft from which the door (in two halves) is suspended. When the lift approaches the opening it rotates the chain-wheels and so closes the door.

Girders.—17,428. H. J. Armstrong, Markdale, Grey, Ontario, Canada. Each end of the beam (say of H-section) is strengthened by struts reaching from the web to the edge of the flange, while a tube (riveted on) curves from the bottom flange at one end to the top flange at the other end of the girder.

Cutting Glass.—18,183. S. Disselkoen, 78, Amsteldjik, Amsterdam. The glass is cut by means of a ribbon or wire driven like a band-saw, and fed with corundum powder mixed with oil.

Water-Closets.—19,420. N. E. Cooke, Swadlincote, Burton-on-Trent. With water-closets made in two parts there is a tendency for the basin to tip up from the syphon part below. To overcome this a flange or rib is provided on the basin and a corresponding hook-shaped projection on the syphon.

Wood-Block Floors.—20,130. H. P. Clemetson, 9, North Street, Ashford, Kent. The blocks are held down by wires which pass through them in rows, clenched at the ends.

1901.—Centering for Fireproof Floors.—14,498. P. A. Newton, 6, Bream's Buildings, Chancery Lane, W.C. (*The New Jersey Wire Cloth Co.*, Trenton, Mercer, New Jersey, U.S.A.). The centering is supported by hangers during the construction of the floor and the setting of the concrete. These hangers pass over the tops of the beams, and are cut when the floor is set, thus releasing the centering.

The following specifications were published on Saturday last, and are open to opposition until November 11th. A summary of the more important of them will be given next week.

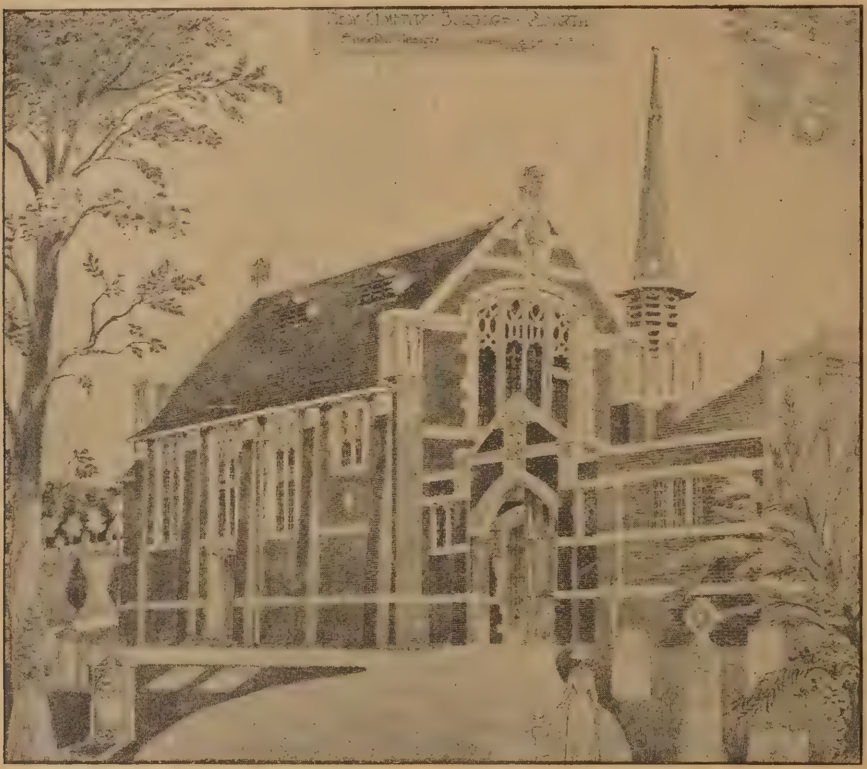
1900.—15,752, Hirst & Ide, electroliers and pendants. 16,004, Rawson & Littlefield, refractory bricks, furnace linings, &c. 16,019, Grimshaw, door-closing apparatus. 16,304, Roberts, kitchen ranges. 17,770, Forti, lighting and extinguishing distant gas burners. 18,583, Ridgway, apparatus for distributing sewage on to filter beds. 18,673, Welsh, measuring and registering taps. 18,693, Friswell, refractory materials for building. 18,849, Matthews, tiles, surfacing slabs and blocks. 18,937, Brown & Brown, extensible ladders. 19,198, Wesselmann, lifting blocks. 19,220, Hirst & Collings, connections for electric-light pendants and other fittings. 19,548, Johnson, stiff-plastic brick moulding and pressing machines. 19,710, Phillips, reversible windows. 19,881, Easily Cleaned Window Co., Ltd. & Grinnall, revolving sashes. 20,032, Scott, heating apparatus.

1901.—903, Adams, syphonic discharge apparatus. 8,129, Schill & Primrose, apparatus for the manufacture of gas. 14,309, Mallory, door-holders. 14,581, Harry & Harry, tanks in detachable parts. 14,683, Smith, strainers for paint. 14,831, Freckmann, cement slabs for ceilings. 15,008, Smith, door-hangers. 15,855, Hefrwagen, interior decorations.

Law Cases.

An Oldham Builder's Failure.—At the Oldham County Court last week the public examination in bankruptcy took place of William Wood, joiner and builder, of the Watersheddings Saw Mills, Oldham, who had been adjudicated bankrupt on a creditor's petition. The liabilities were £1,418 5s. 6d., and the assets £149 5s., leaving a deficiency of £1,269 0s. 6d. He attributed his failure to want of capital and losses on speculation. The examination was adjourned.

Unprofitable Hotel Building.—At the London Bankruptcy Court a receiving order was recently made against F. Dudley Hayward, contractor and engineer, of Gracechurch Street, E.C. It appears that the debtor, who started in business about four years ago, has been principally engaged in building hotels. Amongst others, he contracted to build the Oban Palace Hotel, over which he estimates he lost about £10,000. He also contracted to build the Metropole Hotel, Southend, under which contract he was financed to the extent of over £300,000. He mortgaged the building to the financiers, who eventually foreclosed, and he attributes his failure to the stoppage of financial supply and to heavy law costs. He returns his liabilities at £310,000.



An Appeal relative to New Streets.—At the Surveyors' Institution, Westminster, on Friday last, the Tribunal of Appeal heard an appeal of Mr. H. W. Forster, M.P., against the refusal of the London County Council to pass certain plans for the construction of four streets on the appellant's estate near Catford, in the Lewisham district. The alleged ground of refusal was that the roads proposed did not afford direct communication between two roads laid out for carriage traffic; but it was alleged that the real ground was that the roads proposed did not afford communication with the adjoining Corbett estate, which was also being laid out for building. The court decided to allow the plans subject to Road No. 4 being laid out and completed before the other three roads were constructed, and allowed twenty-five guineas costs to the appellant.

A Road Contractor's Affairs.—At Henley last week George Herbert Robinson, of Endon, engineer and surveyor (also trading as Horobin & Co., at Cobridge, road contractor), came up for examination. The statement showed gross liabilities £2,865 5s. 9d., and estimated deficiency £2,326 10s. 6d. The debtor stated that he bought the business of a road contractor in 1898. He gave £600 for it, and in addition agreed to discharge a liability of £140 on a bill of exchange. He attributed his losses to contracts: on one contract at Burslem he lost £700 through the rise in the price of materials. He had been living at the rate of £300 per year. The Official Receiver (Mr. Thomas Bullock): So far as I can see from these papers you have not made £50 for the last three years. The examination was adjourned.

A Building Speculation which Ended in Bankruptcy.—The first meeting of creditors under the failure of C. G. Crowdon was held last week. The debtor, described as a builder of Westbourne Grove Wharf, Paddington, which business he started in 1899 with a capital of £100, has for five years been managing director of the Worcester Fire Clay and Blue Brick Co. His building operations were carried on at Edgware Road, Kilburn, and elsewhere. Three months ago he purchased for £15,000 about 12 acres of building land at Maidenhead. The money was raised on mortgage, and he anticipated making a substantial profit out of it. The failure was attributed to inability to let properties when completed, to excessive law costs and interest on borrowed money. The debtor returns his unsecured debts at £1,500, and states that he has shares and debentures in the Worcester Fire Clay Company which are charged, the value of which he returns at £3,000 over and above the charges. Proofs to the amount of £8,577 having been dealt with, the meeting was adjourned for three weeks with a view to a proposal being made to the creditors.

NEW CEMETERY CHAPEL, PENARTH.

THIS design by Mr. William H. Ashford, A.R.I.B.A., of Cardiff, was recently selected by the assessor, Mr. G. H. Oatley, F.R.I.B.A., in a local competition. The site of the new cemetery consists of about five acres of considerably inclined land situated on the south-west of the town and adjacent to the Lavernock Road. The proposed buildings will consist of a chapel accommodating 100 persons, with a vestry attached, a small organ gallery at the west end, and a bell turret (which also contains the staircase to the gallery), a mortuary with viewing room, and entrance lodge and gates. The conditions required that a narthex or covered shelter should be provided to accommodate a second funereal party, and that direct exits should be arranged on both sides of the chapel. The walls will be of local brick faced with red-pressed bricks, the dressings being of Corsham Down stone. The roofs will be of open timberwork covered with Welsh slates. Internally the walls will be finished with plasterwork and red pressed bricks. Clear-glass leaded lights will be used in the window openings and steel casements. The estimated cost is £3,000.

Engineering Notes.

The New Reading-room, Baths and Club at Tankersley is having the entire warming, ventilating and hot-water supply systems carried out by Messrs. John King, Ltd., engineers, of Liverpool.

Lady Binnie, the wife of Sir Alexander Binnie, the distinguished engineer, died last week. The deceased, who was a daughter of the late Dr. W. J. Eames, of Londonderry, was married to Sir Alexander in 1865.

The Portsmouth Electric Tramways, which are upwards of fourteen miles in length, were formally inaugurated last week. The contracts for relaying the lines, overhead wires and power station represent upwards of £280,000, and with the amount to be paid for the acquisition of the old system the Corporation has incurred an outlay of £600,000.

Hampstead Heath and Electric Railways.—The National Trust for places of historic interest or natural beauty has sent an appeal to the promoters of the Charing Cross, Euston and Hampstead Electric Railway suggesting the desirability of their adopting an alternative route to that under Hampstead Heath, as now proposed, when the consideration of their Bill is resumed by Parliament next session.

Electric Light in Stepney.—The London County Council has sanctioned the borrowing by the Stepney Borough Council of £29,507 for the purpose of completing the electric-light installation. The rate collectors have been instructed to deliver with the next demand notes for rates a circular setting forth the prices charged for current, and the advantages to be derived therefrom.

Electric Tramways in Surrey.—The London United Electric Tramways, Ltd., have given notice to local authorities in Surrey of their intention to apply for further extensions of their system of electric tramways in the county as follows: (1) A line from Epsom to Wimbledon, along the main Epsom Road through Ewell, Morden and Merton; (2) a line from Surbiton to Croydon, through Ewell, Cuddington, Cheam, Sutton and Carshalton; (3) a line from Epsom to Ewell; (4) a line from Hook to Leatherhead, through Chessington. One of the company's proposals is to lay a line to Epsom racecourse, and they have asked the Epsom District Council to determine whether such a line would be advantageous or not. The company promise that the fares shall be less than a halfpenny per mile and less than a quarter of that sum for the industrial classes between certain hours.

The Nottingham Midland Railway Bridge in Carrington Street is being reconstructed. The work is to be accomplished in two portions, and that part adjoining the station has been undertaken first. In order to facilitate the work and at the same time continue the section of the tramways from Wheeler Gate to Trent Bridge, the rails have been deviated slightly to the Queen's Walk side of the roadway. The greater part of the stone wall which continues the bridge in the direction of Queen's Road is being demolished, and in a very short time excavations will be commenced in preparation for the foundations of the new bridge. According to the specifications, the iron portion of the bridge which serves for passenger traffic is not to be interfered with at all, but the eight stone arches in continuation of that are to be entirely removed and steel girders are to be substituted. This will necessitate the raising of the bridge considerably; and the whole of Arkwright Street to Crocus Street will have to be taken up and levelled to maintain the same gradient as prevails at the present time. The work has been entrusted to Messrs. Kirk, Knight & Co., of Sleaford, and the official estimate is that the work of reconstruction will occupy twelve months.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Exactly in the degree in which you require your decoration to be wrought by able men, you diminish the extent and number of architectural works. Your business as an architect is to calculate only on the co-operation of inferior men, to think for them, and to indicate for some of them at least such expressions of your thoughts as the weakest capacity can comprehend and the feeblest hand can execute.—RUSKIN ("Stones of Venice," Vol. I.).

Our Plates. THE house at Warlingham, Surrey, occupies an elevated site with fine prospects on the garden front over the surrounding country. Strict limitation of cost has necessitated simplicity in the treatment and construction of the building and the employment of plain and easily-obtainable materials. The lower portion is faced with red bricks, the upper with rough-cast and bright red weathertiling, and the roofs are covered with dark-brown tiles. The use of stone has of necessity been avoided. The work has been carried out by Messrs. J. T. Ward, of Warlingham, under the directions of the architect, Mr. W. H. Atkin Berry (Kidner & Berry), of 23, Old Broad Street, E.C.—The house at Roehampton, of which Mr. A. J. Hardwick is the architect, has lately been completed at Nepean Road for Mr. T. D. McMeekin. It is carried out in red brick with Leatherhead tiles. The half-timber work is in deal left rough from the saw and stained down to a vandyke brown, and the porch and verandah are carried out in oak. A feature is made of the hall, the constructional woodwork of the ceiling being left revealed and rough-cast in between the joists. The ingle-fireplace, with a raised hearth, is finished in dull red Ruabon bricks and contains a specially-designed hammered-iron dog grate. It is panelled above the line of the mantelshelf and is lighted by two small leaded windows on either side. A rough-cast and half-timber frieze is carried around the hall, and the treatment of the entire woodwork is that of a black-brown, as against a dull green wall-covering up to the bottom of the frieze. The doors throughout are fitted with crossed garnett hinges and thumb latches of quaint design. The perspective is by Mr. Sydney Newcombe.—The houses on the Ditton Road, Surbiton, for Mr. E. R. Babbs, are carried in white rough-cast with "Excelsior" green slating. The outside woodwork is painted white, the external ironwork black, and the doors are painted green. The hall is so arranged as to form a small sitting-room, which is an advantage in a small house. The stairs have long tapering newels and are painted white. Upstairs there are four bedrooms and a bathroom. Mr. A. J. Hardwick, of Kingston-on-Thames, is the architect. The perspective is by Mr. Sydney Castle. Messrs. Kelsey & Sons, of Chessington, Surrey, are the contractors for both houses.

Technical Education. LAST week Lord Avebury laid the memorial stone of the new technical schools which are in course of erection at Southend-on-Sea. The buildings occupy a central site at the junction of London Road and Victoria Avenue, and the accommodation will comprise a large lecture-hall capable of seating 400 persons, physics and chemical laboratories and demonstration-rooms, as well as ordinary classrooms and a very complete art school. The estimated cost of erecting, equipping and furnishing the new schools is £19,000, exclusive of the site, which forms part of the land belonging to the Corporation. Mr. Henry T. Hare, F.R.I.B.A., is the architect. After the ceremony Lord Avebury made a speech. He said that of all the great discoveries for which the last century was remarkable he should say that the most significant was as to the importance of education. If there was to be progress in the human race it must be by means of a sound and good education, not only of our children, but also of those who were grown up. It was only by observation and by experiment that they could determine facts. He confessed he was not satisfied that their system of education was as yet ideal. It was still, he thought, too narrow and too bookish. Education should be moral and religious, useful and practical, interesting and inspiring. Every child should have a good grounding in Nature knowledge, and specialising should not begin too early. The present education or rather half education was not the fault of the preparatory schools. Older universities and the great public schools must bear the responsibility. Out of 10,000 hours of study at the public schools only 300 were devoted to science. A great deal was heard about the loss of our commercial position, and especially about the great strides made by Germany. He saw no reason for discouragement, but was profoundly convinced that we could not expect to hold our own unless our system of education was greatly modified. What had technical instruction done for Germany? There were some interesting figures in the diplomatic and consular reports issued by the Foreign Office, especially in those of Consul General Oppenheimer, Consul-General Schwabach, and more particularly in that of Dr. Rose, of Stuttgart. Leibig's discovery, as it might fairly be called, of superphosphate of lime had created a great industry. In 1867 the production was 1,000 tons, while in 1899 it was no less than 750,000. The value of the organic dyes made in Germany in 1898 was no less than £6,000,000. The German dye-works employed about 20,000 men and over 500 academically-trained chemists, several millions of capital, and were very profitable. The cost of vaseline had been reduced from £350 per kilo to £6, and the export of essential oils amounted to over £100,000. Germany now exported of soluble glass 6,000 tons; of ultramarine, 3,000 tons; of oils, 70,000 tons; and of white lead, £218,000 worth. Taken altogether, the chemical industries, without sugar, reached a value of over £50,000,000. It was evident, then, that the technical instruction of Germany had been a very remunerative investment. In the first instance, no doubt, it was a great national advantage, but it was a boon also to the world as a whole.

Of Stonehenge. SOME rather hasty guesses have already been hazarded about Stonehenge, and a paragraph which can hardly be described as "inspired" mentions the famous stones in connection with the Stone Age. A book lately published, and written by Lady Antrobus, furnishes some very interesting particulars of the archæological history of Stonehenge. The first author who is considered to make unmistakable mention of Stonehenge is Henry of Huntington (twelfth century). He speaks of it as the second wonder in England and calls it Stanenges. Geoffrey of Monmouth and Giraldus Cambrensis wrote about it in the same century. But there is a supposititious mention of it more than 1700 years before these chroniclers. Hecatæus, the Milesian, who lived about 500 years B.C., mentions a great temple to Apollo, circular in form, which was built in the island of the Hyperboreans, "the fruitful island that stretches northwards of Gaul in the great ocean stream." Mr. E. S. Maskelyne inclines to the belief that the temple, a famous one, was built by the Phœnicians.

The Kaiser Objects. THE Kaiser has refused to sanction the erection of three ornamental fountains designed by Herr Hoffman, the Berlin city architect, for the Friedrichshain Park in the north-east of the city. The Kaiser has addressed a letter to the municipality explaining that he took the step on account of his artistic objection to the design. Models of the proposed fountains occupied a prominent place in the recent exhibition of Berlin modern architecture, and were there viewed by the Kaiser. The Jury of Arts had proposed a large gold medal for Herr Hoffman, but the Kaiser has only granted him a small one. In his Majesty's opinion the idea of the ornamentation of fountains illustrating well-known German fairy-tales is too garish and showy, and he proposes certain alterations which he desires to be carried out. The conflict between the Emperor and the city of Berlin over his Majesty's opposition to the construction of an electric railway over Unter den Linden is now about to enter upon another stage. Burgomaster Kirschner proposes to lay all the documents regarding the matter before the City Board of Aldermen. The "National Zeitung" states that his Majesty refuses to sanction the erection of several new city buildings, and a bridge

Surveying and Sanitary Notes.

Beckenham Street Improvements.—A Local Government Board enquiry was held recently into the application of the Beckenham Urban District Council for sanction to the raising of a loan of £5,740 for works of private street improvement. The four roads to be dealt with are Bromley Grove, Shortlands, Queen Anne Avenue, Warwick Road, and Church Road, Shortlands.

Open-Air Sanatoria, now becoming so generally popular in Europe, are said to owe their origin to Miss Florence, Nightingale. This notable woman first cured M. Benet, of Mentone, by advising him to pass the better part of his time out of doors, to reject medicines and to apply himself to a liberal diet. The first establishment devoted to the open-air cure was founded at Gœrbersdorff in 1859 by Hermann Brœhmer, though it was left to his disciple and pupil Dettweiler to perfect the theory in the course adopted in 1875 at the sanatorium of Falkenstein. There are now in the Valley of Davos about 3,000 patients and sixteen physicians.

The Westminster Paving Contracts.—At a meeting of the Westminster City Council held last week some discussion took place as to the recent contracts for paving certain thoroughfares in Westminster, notably Whitehall and Parliament Street, with American red-gum blocks. It arose on a notice of motion by Mr. Alderman Emden that the council of each Metropolitan borough, the Common Council of the City of London, and the London County Council should be invited to appoint one or two of their members and their engineer or surveyor to attend a conference, to be held at the Westminster Town Hall, for the purpose of considering the best materials and means of paving the streets of London. Eventually it was resolved to adjourn the consideration of the motion.

Do not Want Cheap Dwellings.—Residents of St. John's Wood have prepared a petition which is now being circulated for signature, and which will shortly be presented to the London County Council, to protest against the erection of workmen's dwellings in Grove-end Road. Briefly, the grounds for the objection are that it is opposed to every canon of decency to introduce into the heart of such a neighbourhood dwellings of so incongruous a character as those proposed to be erected; that the rental value of the properties will be greatly reduced and the sum total of the rates injuriously affected; and that workmen's dwellings mean overcrowding, the evils of which are obvious. It is also pointed out with emphasis that the proposed site is absolutely unsuitable for the housing of a dense population because it is a cul-de-sac, and that the danger at the time of a fire would be enormous. A public meeting of protest is to be held shortly.

Open Spaces in Fulham.—Another open space is about to be secured for the borough of Fulham, where building operations are in active progress, and as a result the population is rapidly increasing. The borough already contains three open spaces—Ellbrook Common, which is under the control of the County Council; Lillie Road recreation ground, and Bishop's Park. The recreation ground consists of 10 acres, and cost £20,000. Bishop's Park covers 15 acres and is well laid out. It has been determined to enlarge the park by acquiring 100 acres of meadow land which adjoins at a cost of about £16,000. A scheme has just been completed by the Fulham Borough Council to acquire a fourth open space which, unless seized at once, would soon have been in the hands of the builders. This site is in the Sands-end or eastern ward of the borough, near to Hurlingham Park. It consists of 22 acres, and has been purchased at a cost of £1,500 an acre from the owner, Miss Sullivan. At present it is under cultivation as market-gardens, and is known as the South Fields Estate. Including the laying-out, drainage, and other matters, the total cost will be £45,000, towards which the London County Council have agreed to contribute £30,000, leaving £15,000 to be borne by the local rates. It is expected that the new park will be thrown open to the public in about twelve months' time.

BUILDING CONSTRUCTION.

(Continued from p. 115 of No. 346.)

8. A STRAIGHT line can be used to represent a number; a line 6in. long will indicate the number 6 if we make 1in. our counter, or 48 if $\frac{1}{8}$in. is the counter, or 60 if $\frac{1}{10}$in. is the counter, or 96 if $\frac{1}{16}$in. is the counter, and so on. These numbers, like ordinary abstract numbers, may be used to indicate quantities of any kind, and arithmetical operations may be carried out on a drawing-board with sufficient accuracy for many purposes. (The student will find when he has made further progress that what are called graphic methods are of very great value in calculations far beyond the range of what we understand by "arithmetic"). By a "line" I mean a *straight* line. A line which represents a number may also define a direction, and if we mark it with an arrow head it may be made to show the course of motion or of a tendency, for some understood reason, to motion.

The line A B (Fig. 2) 2in. long may represent a force of 2lbs. pulling the point A in the direction A B, or, if we suppose the point at B to be the force, is pushing the point B.

If we put a knot on a string, and if two persons pull equally at the ends of the string, they apply equal and opposite forces to the knot. The student must be careful here to see that in this illustration no assumption is made as to the length of the string; we have not used the length of the string to indicate the amount of the force in lbs. If we make the force at one end of the string greater than at the other the knot will move in the direction or course of the greater force. If we tie a second string at the knot and pull at an angle to the first line of action, the knot will be pulled aside; and as long as the sum of any two of the three forces is greater than the third, the three lines of string will lie in one plane and they will settle in a definite position for each system of loading. It will be found that the forces are proportional to (may be represented by) the three sides of a triangle of which the angles are the supplements of the angles between the strings around the knot. If we know one of the forces, and if we have the angles between the strings, it is easy to find the other two forces.

For example, the point P (Fig. 3) is in equilibrium, and we know that one force is 14lbs. We draw the triangle 14, 12, 10, so that 14 is 14 units of some scale (say $\frac{1}{8}$in.), and having its sides parallel to the strings we can read the values 12 and 10 off the scale. It will be observed that the sense or *course* of the forces in the triangle is in sequence round the triangle.

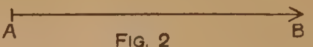


FIG. 2

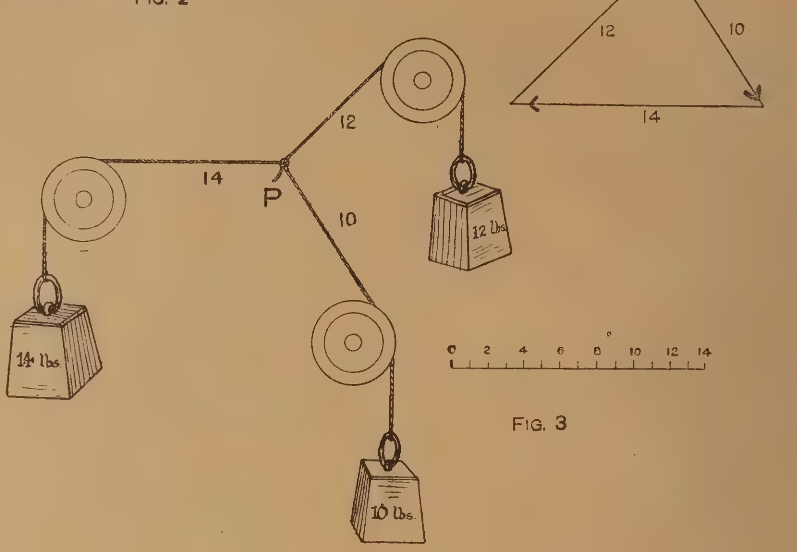


FIG. 3

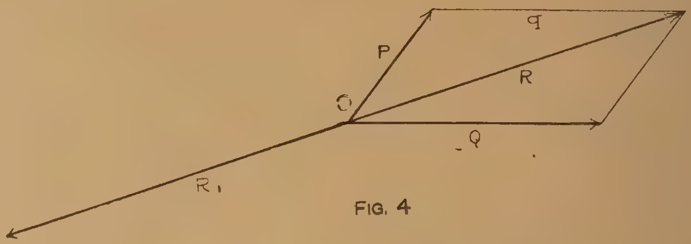


FIG. 4

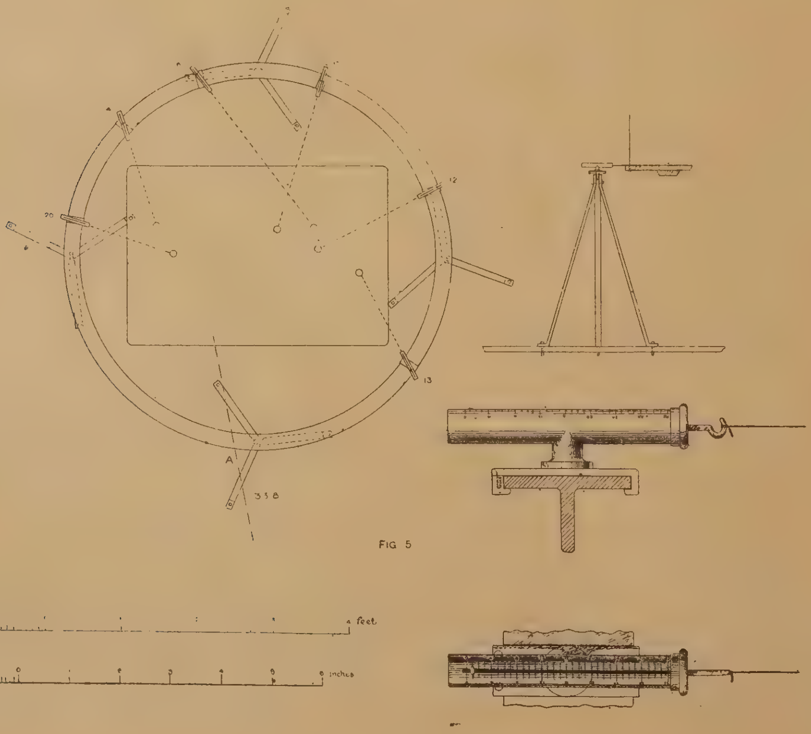


FIG 5

We have assumed the forces as pulling out from the knot or point. Our construction will also hold if the forces push in upon the point. This is known as the triangle of forces. It is practically the same thing as the parallelogram of forces. The apparatus which I describe further on will enable this and many other propositions of statics to be experimentally proved.

9. *The Parallelogram of Forces.*—If two forces are shown as P and Q (Fig. 4) acting at the point O, they may be replaced by a force R, represented in direction and magnitude by the diagonal of the parallelogram of which P and Q are conterminous sides. Suppose the three forces P, Q, R to be in equilibrium. A force equal and opposite to R may be put in place of P and Q, but the triangle P *q* R has its sides parallel and equal to P, Q and R; R and R′ are therefore equal and opposite forces. When two forces are replaced by the diagonal of the parallelogram formed upon them, they are said to be *compounded;* on the other hand, when a single force is replaced by two other forces (the sides of a parallelogram of which the first force is the diagonal) it is said to be *resolved.* We speak of the *composition* and the *resolution* of forces.

FORCES APPLIED TO STRUCTURES.

10. A piece of building material, as iron, wood, stone, &c., may be regarded as a rigid body when we are considering forces applied to it (which will not seriously destroy or break it) in reference to other bodies apart from it, and there will be no practical difficulty in regarding the same piece of material—or structure—as *not* a rigid body if our concern is with the stresses in its parts.

I have devised a piece of apparatus which may be used with advantage in experimentally proving much that it is necessary to know, and I hope to be able from its drawing and descriptions of its use to give clear ideas in regard to the application of forces in *one plane* to a rigid body.

The apparatus consists of an ordinary drawing-board suspended by four cords or fine wires from the ceiling, adjusted with reference to a horizontal ring on which spring balances of the kind shown may be adjusted at any part and at any angle to the centre line of the ring. The board may be subjected to slight displacement horizontally without appreciable effect from gravity, and it will behave as a rigid body acted upon by the forces shown on the spring balances. The balances may read ounces, and the connections to the board may be threads fastened with drawing pins; the amount of the force may be regulated when the thread is given a turn or two on the hook. The illustration (Fig. 5) shows forces of 20, 14, 6, 15, 12 and 13. It will be found that a force of 33·8 acting in the line A will balance these.

Fig. 6 shows how 33·8 may be arrived at by drawing. Making use of the parallelogram of forces: 20 and 14 are produced to meet and compounded, and they may be replaced by 31; 13 and 12 may be replaced by 18·5; 18·5 and 15 may be replaced by 26; 26 and 6 may be replaced by 22; and finally 22 and 31 may be replaced by 33·8; so that a force equal and opposite to 33·8 will balance all the forces acting on the drawing-board and will keep it at rest.

We know from Mechanics that if all the lines of direction of the forces met in a point, the polygon B would by its sides represent the forces. It will be found by experiment that, as shown by this drawing, the polygon B represents the balancing forces in amount and direction whether the lines of the forces intersect in a common point or not; but it does not show the line of the balancing force with reference to the drawing-board. It is manifest that we shall get the same polygon for any other set equal to these and having lines of action parallel to these lines.

The polygon method, then, will enable us to find the amount of the balancing force and its direction, but it will not enable us to determine its line on the drawing-board.

Our first construction determined 33·8 in amount, direction and position; and so far as this particular problem is concerned it is complete. It will, however, be found to be of advantage frequently for practical work to proceed by the polygon method.

The line 20 is drawn parallel to the force 20, and it is made of the length of 20 divisions of some scale; 14, 6, 15, 12 and 13 are drawn in the same way, and we find as the balancing force 33·8. It will be found if we apply this force by means of our apparatus at random we shall subject the drawing-board to a twist: we have what is called a "couple." The resultant of all the forces pulling in one direction and the equal balancing force pulling in the opposite direction, but not in the same line, will twist the drawing-board till these equal and opposite forces are in one line and balance.

Fig. 7 shows one way of locating 33·8. We begin with 20 and balance it with two forces 1 and 2, and we draw the triangle of these three forces as 1, 20, 2 (remember that the lengths of 1 and 2 as drawn on the rigid body bear no relation to the amounts of these forces). In like manner we draw 2, 14, 3 and 3, 6, 4, &c. Proceeding in this way we get 7, which must intersect 1 in the line of 33·8, and now we have a point on a line and the direction of the line, so that the line 33·8 is determined.

It may be observed that, owing to each pair of triangles having a common side, the lines 1, 2, 3, &c., in connection with the polygon B have a common point, and from this circumstance it has been called "a polar" or "the polar." This name may be of use in marking a step in a common operation where one is following a card without quite knowing why. Name or no name, I think it well for the student to see how the peculiarity naturally occurs. If he does he will not require a special name for it, and this will give, as far as he is concerned, some respite to a much-put-upon word.

If we turn again to the figure inside the ring shown by the dotted lines 1, 2, 3, &c., we may suppose it to be formed of a piece of string (or rope) having a knot at each angle, to which the several forces are attached. The drawing-board is now relieved from all stress, and the forces are all employed in stressing the string; from this idea of a string this dotted polygon is called "the funicular." Again, I think the student should, whether he uses the name or not, be independent of it. 1, 2, 3, &c., will answer if they are rods rather better than as strings, because rods will not give any suggestion of sag; indeed, in the usual cases which occur in practice the sides of the funicular which answer to 1 and 7 are not in tension, and string will not serve for these sides. Further, if we reverse the *courses* of the forces, rods will bear compression stresses.

11. *Couples.*—If the board is subjected to two equal and opposite forces which are not in the same line it is said to be subjected to a *couple*, or twist. The couple 15 (Fig. 8) gives a twist in the direction of the hands of a watch about a centre A. Now it is not obvious from mere inspection that an equal and opposite twist given by 10·125 about B will balance the couple 15, but the apparatus will at once show that this is so. Moreover, it will be seen that the forces 15, 10·125, 15 and 10·125 may be dealt with as forces acting on the drawing-board without any question of couples, and they will be found to exactly balance.

12. *Parallel Forces.*—When it is said that the point of application of a force may be transferred to any point in its line of action it is assumed that the force is applied to a rigid body and that the line of action lies on or through

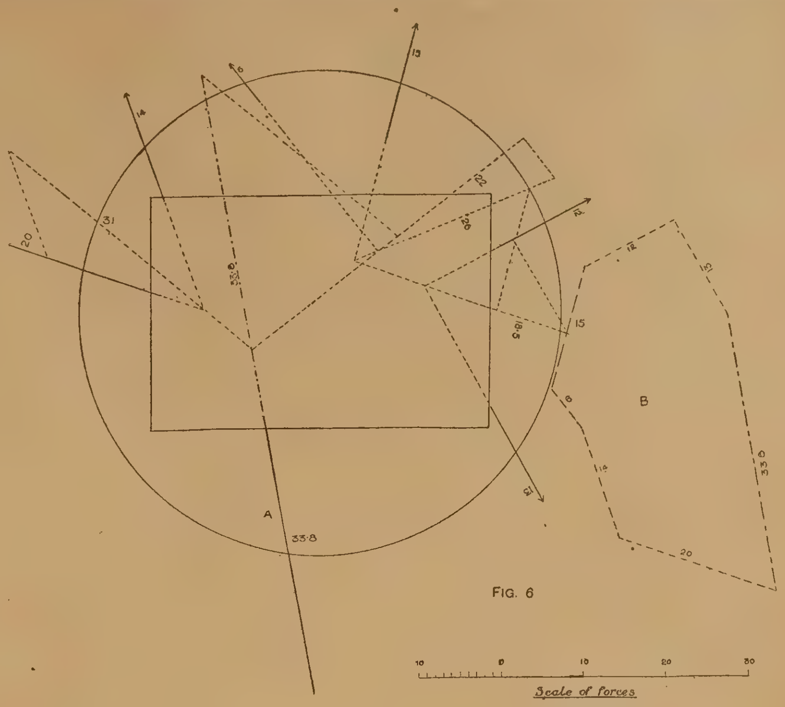


FIG. 6

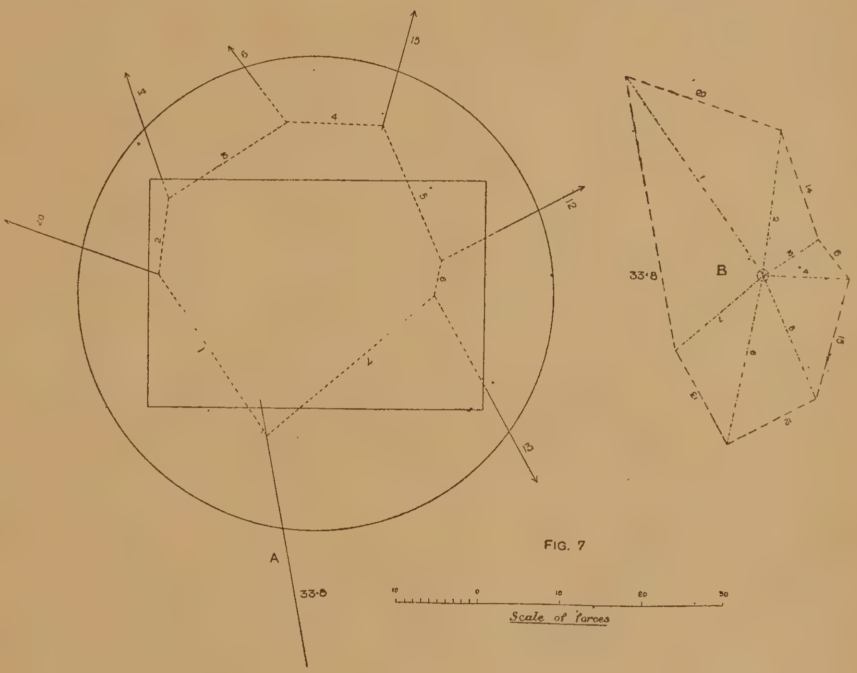


FIG. 7

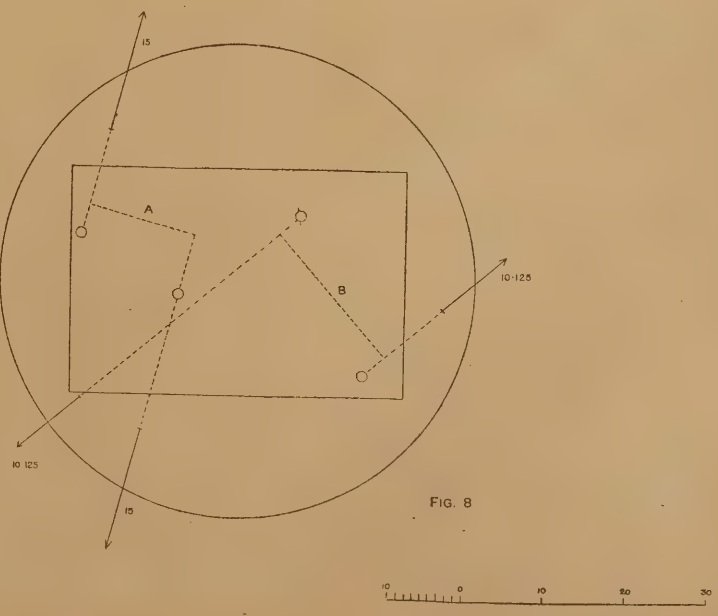


FIG. 8

the body. Two forces in the same plane inclined to one another may be connected to the point where their lines of action intersect by strings or rods, and they may be supposed to act at this point, where they may be balanced by a force equal and opposite to their resultant, as shown in Fig. 4.

Parallel forces can only be made the subject of investigation when we consider them as applied to a rigid body of sensible dimensions, and their relations can be shown by the apparatus.

If we have a piece of wood A B (Fig. 9) pulled west by parallel forces 4 and 6, a force of 10 pulling east will balance 4 and 6 (*i.e.*, keep A B at rest) if A X = 6 and B X = 4, or any multiples of these numbers. It will be seen on inspection that the above example of parallel forces may be also looked upon as a case of the balance of two equal and opposite couples 4 and 4, and 6 and 6.

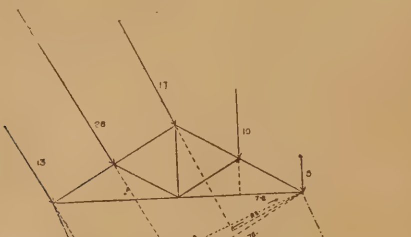


FIG. 12

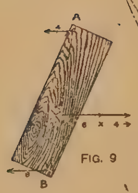


FIG. 9

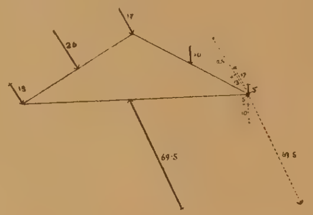


FIG. 10

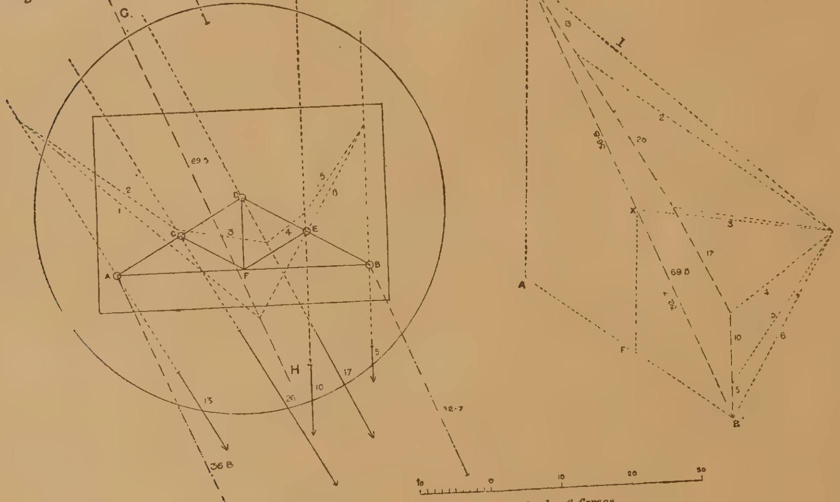


FIG. 11

Every case of parallel forces may be dealt with as an example of couples.

13. *Taking Moments.*—What is called taking moments about a point, where several forces are applied to a rigid body, is of frequent use in calculations, and it is well to have clear ideas of what is assumed. A rigid body at rest under any combination of applied forces may be conceived to be at rest under a combination of couples, of which one set of forces are the forces applied to the body and the other set of equal forces are applied to the body at any point whatever (see Fig. 10).

14. *Centre of Parallel Forces.*—From Fig. 9 it will be seen that in whatever direction 4 and 6 are turned the point X is invariable. If there be any number of parallel forces applied at definite points of a rigid body, they may be compounded, taking two at a time, and we shall obtain half the number of new definite points. This being repeated a sufficient number of times, we ultimately come to one definite point which is invariable whatever may be the direction of the parallel forces. This point is the centre of the particular system of parallel forces.

Centre of Gravity.—A body may be supposed to consist of a great number of particles held together in some way. The weight of each particle may be considered as a force applied to the body. The direction of all these forces is the same, and they have an invariable centre in whatever way the body may be turned. This point is the centre of gravity of the body. The centre of gravity of a body is not necessarily a point attached to the material of the body. When we speak of the centre of gravity of a line we mean that of a fine piece of wire of the shape of the line—curved or straight. The centre of gravity of a surface is the centre of gravity of a very thin plate or shell of the shape of the surface. When a body is suspended from a point by a string, the suspending string produced passes through its centre of gravity; if again suspended from a different point where this second line intersects, the first line is the centre of gravity of the body.

The centre of gravity of a triangle is the point where the medians intersect; of a sphere, in the centre; of the surface of a sphere, in the centre of the sphere; of a cone or pyramid, in the line joining the vertix to the *c* of *g* of surface of base, one-fourth of its length up from the base; of a hemisphere, $\frac{5}{8}$ of the radius of the sphere measured from the centre (at right angles to the great circle).

The student will require to know the centres of gravity of many surfaces, lines and solids for calculations of various kinds as we proceed.

15. Fig. 11 shows a centre-line drawing of a model king-post roof-truss. The truss is loaded at A, C, D, E and B with loads of 13, 26, 17, 10 and 5 cwt. Find the reactions at the abutments A and B.

(*a*) We may proceed as in Fig. 6, and find the resultant of the forces applied to the truss considered as a rigid body; and if we determine that the reactions shall be parallel forces, we shall make them parallel to this force and resolve this force into parallel components at the points A and B.

(*b*) Fig. 11 shows the usual mode of working this problem. The polygon 13, 26, 17, 10, 5, 69·5 is drawn; the triangles 13, 1, 2; 26, 2, 3; 17, 3, 4; 10, 4, 5; 5, 5, 6 are drawn, and the forces are transferred from the truss to what is called the funicular 1, 2, 3, 4, 5, 6. The resultant, which has been found to be 69·5 cwt., is found to lie in the direction G H, cutting A B at F. If Y B' is cut at X so that $\frac{YX}{XB'} = \frac{F'B'}{F'A}$ the reaction at A is represented in amount by Y X and that at B by X B'.

(*c*) The polygon 13, 26, 17, 10, 5, 69·5 gives the direction. We may obtain the amount of the reaction by taking moments about the point B. Draw perpendiculars to the directions of loads from B, measure the length of these, multiply these lengths by the loads, and divide the sum of the products by the length of the perpendicular from B or A (drawn parallel to Y B'). The quotient should be Y X (Fig. 12).

I have assumed that the reactions at A and B shall be parallel forces, but this is not a necessary assumption. Having got the resultant of the loads on the truss, it may be resolved into two forces whose lines of direction pass through A and B in an infinite number of ways. If either side wall provides in a special way for resistance to what is called the horizontal component of 69·5, it may be all put on this wall, and we may assume that the other wall bears only a vertical load.

(*Note.*—When a force is resolved into two other forces at right angles to one another, in whose plane the original force lies, each of these new forces is *the* resolved part of the original force in that direction.)

Of the three ways above described I may remark:—

(*a*) In practical work the applied forces usually do not intersect within reasonable limits, and compounding in this way under such conditions is tedious.

(*b*) This is the usual method. It is a continuously graphic method.

(*c*) Is probably the best general-purposes practical method. Graphics are good, and all kinds of graphical exercises are useful to the student, but in practical work it is not advisable to take a roundabout graphic way to avoid the ordinary multiplication and division of small numbers. Fig. 12 shows the problem worked by the third method.

[Note to section 5 (p. 115 of our last issue): $v = 2\frac{s}{t}$. (*a*) If a body falls from rest for *one* second the distance through which it falls is 16ft., and its velocity is 32ft. per second: its *average* velocity V in this case is $\frac{v}{2} = 16$. (*b*) If the time is *two* seconds the distance is 64ft. and the velocity is 64ft. per second. V is 32ft. per second. (*c*) If the time is *three* seconds the distance is 144ft., and V is 96, and so on. The equation $s = vt$ should be $s = Vt$. The word "often" should be "after."]

(*To be continued.*)

ST. SWITHUN'S, SOUTHSEA.

THE new Roman Catholic Church of St. Mary and St. Swithun, Saxe-Weimar Road, Southsea, was opened yesterday. The building is in Early English style, from the designs of Canon Scales, of Basingstoke. The length, exclusive of chancel, is 90ft. by 49ft. wide, and the chancel is 35ft. by 28ft. There are two side chapels, one 11ft. by 16ft. and the other 11ft. by 14ft. One only of these is completed, and that has a carved altar, while stained-glass windows have also been given for it. The present altar in the chancel is only temporary, but a suitable one for the position would cost a considerable sum, and the other fittings are complete. The flooring is of Goddard's patent blocks. Another novelty is that the porch is of the Narthex type, the door opening direct into the church. Above this is a gallery for the choir, and the whole building will be fitted entirely with the electric light. Over the further door, adjoining the Chapel of the Sacred Heart, is carved the Sacred Heart, surrounded by a crown of thorns. There is seating accommodation for about 680, and the cost of the church when finished will have cost about £7,000. The builders are Goddard & Son, of Dorking, who have constructed over 100 churches and chapels in various parts of the country.

Keystones.

The Temple Church is under repair.

A New Church at Gosberton, Clough, Spalding, is proposed to be erected at a cost of £1,000.

Municipal Slaughter-houses at St. Ives formed the subject of a Local Government Board enquiry into the application of the Town Council to borrow £1,000.

The Repainting of the Tower Bridge, even under the most favourable circumstances, will not be finished before Christmas. Mr. A. H. Hinns is the contractor. Three coats are being applied, the final one representing two shades of green. The bascules are to be painted terra-cotta colour.

The Charles II. Memorial Stone at the entrance to Lee Lane, Bradpole, near Bridport, was unveiled last week on the 250th anniversary of the fugitive king's escape from Cromwell's troops by turning down the lane on the afternoon of September 23rd, 1651.

A Victoria Memorial at Chobham has been erected on Ship Hill in the shape of a Runic cross of unpolished Aberdeen granite on an ironstone base. The cross stands in a most prominent position, close to the highway, and from its site a magnificent view can be obtained. It has been placed on the bank of the old redoubt erected by the troops in 1853.

A Stained-Glass Window has been erected in Prittlewell Church, Essex, consisting of three lights. The subject is the Crucifixion, and the manner is fifteenth century, freely treated. The scene is viewed through an architectural screenwork of brilliant and silver white glass. The window was drawn by Mr. Percy Bacon, and executed in the studios of Messrs. Percy Bacon & Brothers, of Newman Street, London, who carved and painted the reredos.

A New Mission Church at Blackham, a hamlet in the parish of Withyham, in North-east Sussex, is being erected at a total cost—including the site, building and some of the fittings—of £1,256. The church will be dedicated to All Saints', and will consist of a nave and chancel with a stone bell turret. It is being built of stone from the Hackenden quarry at East Grinstead, with Bathstone dressings, prepared by Messrs. Jenner & Grynyer, of East Grinstead. The bricks used inside have all been made at Blackham. Mr. Charles Day, of Cowden, is the builder; and Mr. Lacy Ridge, F.R.I.B.A., the architect. The accommodation to be provided is for 156 persons.

A New United Methodist Free Church at Westcliff-on-Sea is being erected. It is designed in Late Perpendicular Gothic, freely treated, and is faced with red bricks externally, the dressings and tracery being of white Costessey work. The roof is covered with green slates. The main gable is flanked on the one side by a dwarf octagonal turret, and on the other by a bold square tower, the latter terminating in a spirelet of quaint design. The church is designed for future deep double-transepts, but these are at present only to be erected to a depth of a few feet. A large school and classrooms are provided for in the future. The present portion is being erected by Messrs. Battley, Sons & Holness, of 21, Old Kent Road, S.E., whose tender is for £2,124. The architects, whose designs were accepted in a recent competition, are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clement's Inn, Strand, W.C.

A German Queen's Memorial.—The Kaiser intends to honour the memory of his mother, the late Empress Frederick, by erecting a monument to her in the most conspicuous place in Berlin, namely, at the entrance to Unter de Linden. His Majesty has also drafted a plan for laying-out a large open space just outside the Brandenburger Thor, where this monument will be raised, and beautifying it with fountains and garden plots at a total cost of some £16,000. This is part of the Kaiser's plan to increase the imposing effect of this quarter of the capital, which contains also the Reichstag buildings, the huge column perpetuating German victories over Danes, Austrians and French, and the celebrated Avenue of Victory, which his Majesty has adorned with the statues of his ancestors. Like these monuments, the new one to the Empress Frederick will be in white marble, and on either side of it will be the bust of a noted contemporary of her Majesty.

The Edinburgh Architectural Association has acquired new rooms, and the address in future will be 117, George Street, Edinburgh.

Mr. D. J. Roberts, who was for some years with Messrs. Grierson & Bellis, architects, Bangor, has just been appointed principal assistant architect to the Birmingham Tame and Rea Drainage Board.

A Grammar School for Girls at Framlingham is now being erected. In June of 1892 the committee obtained designs and plans for school buildings, together with a mistress's house; and the plans of Mr. Frank Brown, architect, of Ipswich, which were selected out of the sixteen different sets submitted, are those now being built from.

Hospital Extension at Salford.—The Salford Corporation have just added two new pavilions to the Ladywell Sanatorium at a cost of £20,000. The new structures are designed to accommodate eighty beds, and the rooms are in keeping with those in the old building, being spacious, airy and well appointed in every respect.

A New Church at Newton, Oystermouth, Mumbles, to be dedicated to St. Peter, is being erected. It is proposed to eventually seat 600 persons, but provision is now only being made for 400. The total cost will be about £6,000. The edifice will be situated in a growing district above Langland Bay. Mr. Bruce-Vaughan is the architect, and Mr. Howells (Cardiff) the contractor.

Visit of the Russian Theatre Safety Commission to London.—Count Suzer, the president of the Russian Theatre Safety Commission, is now on a visit to London enquiring into the effect of our regulations. He has inspected the new testing station of the British Fire-Prevention Committee, with a view of providing similar facilities for research at St. Petersburg under a scheme mooted in connection with the terrible fire losses which have occurred in Russia during recent years.

Another Vicar builds his School.—The Vicar-designate of St. Margaret's, Leeds (the Rev. A. H. Kelk) has, with the aid of shop assistants, clerks, joiners, bricklayers and general labourers, all members of his congregation, begun to build a school. More than a month ago they commenced to dig the foundations, involving the removal of about 100 tons of soil. Nearly every evening during August after the day's work was over a band of from ten to twenty or more were at work with pick, shovel and barrow, and they have now completed the necessary excavation, thus saving about £15. The plans, bricks and a four-light leaded window were all given free.

A New Infirmary at Retford has been opened in connection with the workhouse. The architect is Mr. W. Southall and the contractor Mr. C. Jones. The building, which was started sixteen months ago, has been erected at a cost of £4,000; it is built on the north side of the workhouse premises and extends for nearly 200ft. The whole of the buildings are of ordinary red wire-cut bricks and the roofs are of Bangor slates. There are three entrances—the main, and one for males and another for females. The old infirmary will be pulled down and the spaces laid out as gardens. A covered way will lead from the centre of the new building to the kitchens. The whole of the gas- and water-pipes are exposed to view, and made easily accessible in case of repairs.

The Shoreditch Technical Institute, under the management of the Technical Educational Board, commenced its third annual session last Monday evening. The special feature of the work is the practical instruction given in the cabinet-making, woodworking and building trades. There are practical classes for cabinet-makers, carvers, carpenters and joiners, upholsterers, plumbers, electrical fitters and instrument makers, electrical wiremen, plasterers, polishers, as well as classes for the study of the scientific principles which underlie the various trades and the practical drawing and mensuration needed in the workshop every day. A new departure has been made by the Technical Education Board in the establishment of a technical day school for boys who intend to become cabinet-makers, carpenters, joiners, shop-fitters, pattern-makers, turners, carvers or draughtsmen. The boys undergo a thorough training in the nature and use of tools, workshop drawing, arithmetic and mensuration, and in the usual English subjects.

New Premises in Connection with the Rhyl Intermediate (County) School have been opened.

The Worthing Corporation Electric Lighting Works, erected on the site of the old waterworks, were opened recently.

Another Queen Victoria Memorial.—Lord Ashton has given a cheque for £10,000, the estimated cost of the Queen Victoria memorial statue at Lancaster.

"Inglenook," Purley, Surrey.—We learn that the architect of this house, illustrated on page 101 of our last issue, is Mr. Hubert E. Gilford, A.R.I.B.A., of Purley.

"The Law relating to Factories and Workshops."—Messrs. Eyre & Spottiswoode announce that the fourth edition of this book, by May E. Abraham (Mrs. H. J. Tennant) and Arthur Llewelyn Davies, will be ready early in November, price 5s.

The R.I.B.A. and President McKinley's Death.—On the occasion of the death of President McKinley a cablegram was sent by the President of the Royal Institute of British Architects to Mr. Peabody, president of the American Institute of Architects, expressing sympathy.

The Lincoln Diocesan Training College has had a new wing added to it, over £7,000 having been expended upon this and some improvements to the old buildings. The accommodation is increased from 56 students to 104, of whom 83 reside on the premises.

The Royal Albert Asylum, Lancaster, has been extended at a cost of £15,000. Special provision is made by the new wing for epileptics, cripples and feeble patients, whose removal from the main block will enable the number of patients to be increased to about 800.

A Statue of Oliver Cromwell will be unveiled on October 23rd at St. Ives, Hunts. The statue in bronze, which has been on view at the Royal Academy, is by Mr. F. W. Pomeroy. It will be placed on a pedestal of York stone, in the centre of a base consisting of two broad steps of Aberdeen granite, with ornamental lamps on granite monoliths at each corner.

Baths for Old Trafford.—The Stretford District Council have approved plans for the erection of public baths on land situate at the corner of Northumberland Road and Crook Street, Old Trafford, and application will be made to the Local Government Board for sanction to borrow the sum of £14,000 to defray the cost of the proposed building. It is intended to provide two plunge baths, one for males 75ft. by 30ft. and the other for females 60ft. by 26ft., and twenty-one vapour baths.

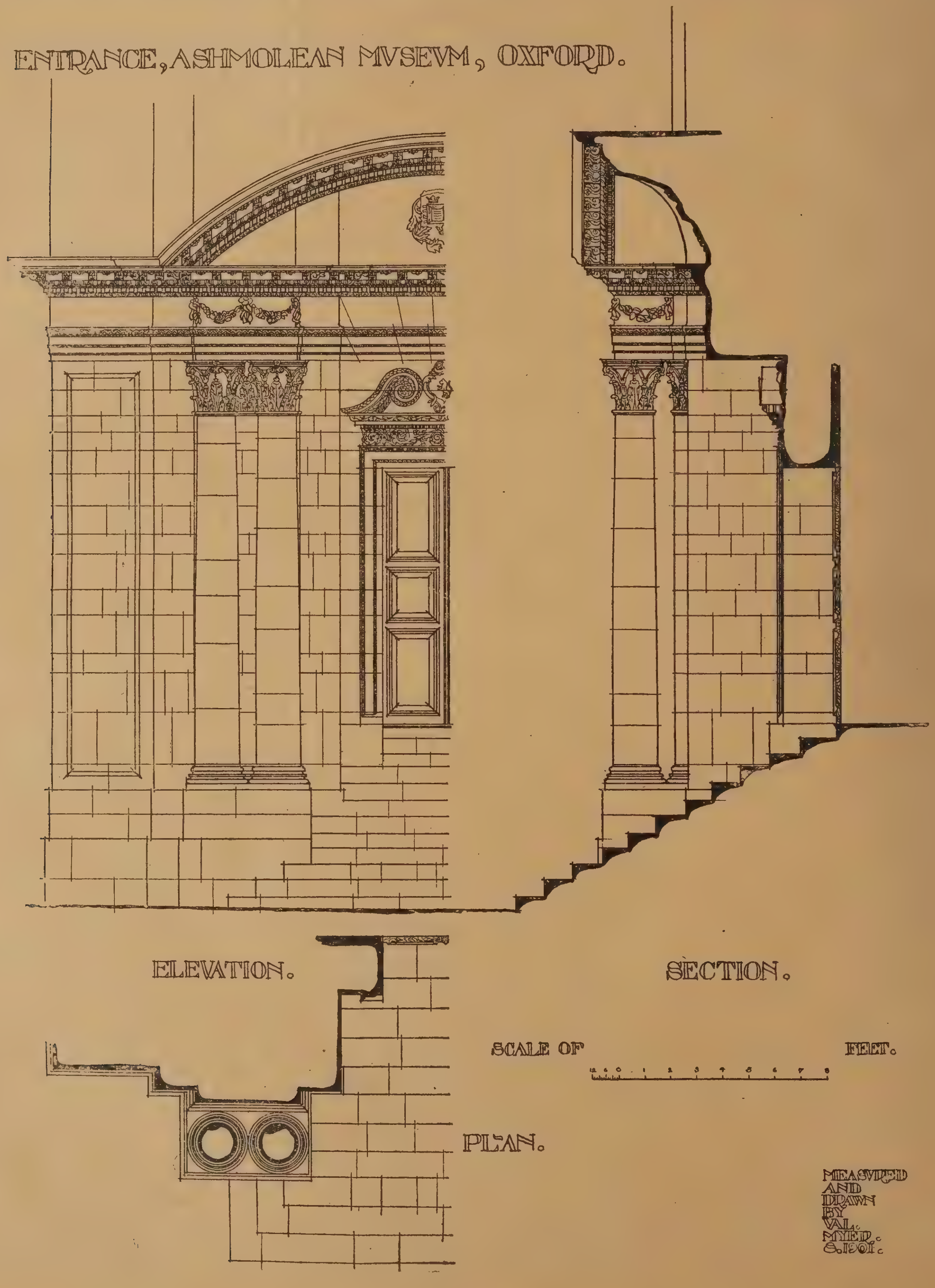
The R.I.B.A. Autumn Examinations will be held as follows: Preliminary on November 5th and 6th; Intermediate on November 5th, 6th, 7th and 8th; Final and Special from November 15th to 21st. Applications for the Preliminary and Intermediate must be sent in on or before October 12th, and for the Final and Special examinations on or before October 26th. Examinations qualifying for the office of District Surveyor in London (pursuant to the provisions of the London Building Act, 57 & 58 Vict. c. ccxiii. s. 140), and of Building Surveyor under Local Authorities will be held by the Royal Institute on October 24th and 25th, 1901. Applications must be sent to The Secretary R.I.B.A. on or before Thursday, October 10th.

Royal Academy Competitions.—This year the Royal Academy biennial gold medals are awarded in painting, sculpture, and architecture, and each carries with it a travelling studentship of £200. The medal for historical painting, generally regarded as the chief of the biennial prizes, is given for the best illustration of the subject, "Saul and the Witch of Endor," 1 Sam. xxvii., 7–14) on a canvas measuring 40in. by 50in. Sculptors have to submit a model (the principal figure 3ft. in height) representing "Boadicea urging the Britons to avenge her outraged daughters," while architects have "A Town Hall for one of the London Borough Councils." The Turner gold medal and scholarship of £50 is also awarded biennially, and the subject for the present year is "One of the Bridges over the Thames in London." The subject for the Creswick landscape prize is "Cumulus Clouds over a Fen Country." All the paintings and models have to be sent in early in December, and on the 10th of that month the medals and prizes will be awarded by Sir Edward Poynter.

New Cottage Hospital at Ebbw Vale has been erected at a cost of £3,000 from plans by Messrs. Lansdowne & Greggs, architects of Newport, Messrs. S. T. Davies & Sons, Ebbw Vale, being the contractors. The building is situated near Hillside House. The ground floor contains the matron's suite of rooms, entrance hall, receiving room and operating theatre. The floor is mosaic, and the walls of adamant cement. The second floor contains a main ward with five beds and a cot; ward with four beds for more serious cases, and a special ward with one bed. There is also a dayroom for convalescents, opening out by means of French windows to a large verandah. The second floor also contains a bathroom, kitchen, lavatories, &c. The whole is heated by high-pressure steam pipes.

THE ASHMOLEAN MUSEUM, OXFORD.

THE Ashmolean Museum at Oxford, the doorway of which is illustrated on this page from measured drawings by Mr. Valentine Myer, was the first public museum of curiosities in the kingdom, having been founded by Elias Ashmole and opened in 1683. The nucleus was formed by the collections of John Tradescant, and not until recently has the museum been made to serve a scientific purpose. It contains models, ethnographical collections, English and Egyptian antiquities, and miscellaneous curiosities. The doorway, which is considered to be one of the finest specimens of this style of work, is said to be the work of Sir Christopher Wren, but the rest of the edifice is generally attributed to another architect. The doorway is now unfortunately in a very decayed state, having been built in friable local stone. Any record of it is therefore the more valuable, and unless steps are taken to preserve it much of the beautiful detail will soon be indistinguishable.


ENTRANCE, ASHMOLEAN MVSEVM, OXFORD.
ELEVATION.
SECTION.
SCALE OF FEET.
12 6 0 1 2 3 4 5 6 7 8
PLAN.
MEASVRED AND DRAWN BY VAL. MYER. 8.1901.

New Companies.

Mills & Guilford, Ltd.

Registered for the purpose of carrying on the business of cement merchant and paving contractor and general agent, now carried on at 15, Talbot Place, Dublin, and elsewhere, under the style of A. E Mills. Capital £2,000 in £1 shares. Messrs. A. E. Mills & Sidney H. Guilford, C.E., are to be the first governing directors of the company, the first-named being the managing director. Registered office : 15, Talbot Place, Dublin.

The Dalmuir Feuing Co., Ltd.

Registered to acquire land at Dalmuir, Dumbartonshire, and to erect dwelling-houses or other buildings. Capital £10,000 in £1 shares. Registered office: 116, Hope Street, Glasgow. No initial public issue.

Smith Slater, Ltd.

Registered to acquire the business now carried on by S. Slater at Greaves Street, Oldham, as Slater & Co., and to carry on the business of manufacturers of draught excluders and door and window fittings, smiths, builders, contractors, iron and brass founders, metal and wood workers, timber merchants, toolmakers, &c. Capital £3,000 in £1 shares. Registered office : 34, Greaves Street, Oldham, Lancashire.

New Street, Birmingham, Ltd.

Registered to acquire an underlease of certain land, messuages, and shops in New Street, Birmingham, and to carry on the business of builders, contractors, decorators, dealers in stone, sand, lime, bricks, timber, hardware, and other building requisites, &c. Capital £15,000 in £100 shares. The first directors are G. J. Eveson, C. Rose and F. Taylor. Registered office : 56, Newhall Street, Birmingham.

Barnett Wood Brickworks, Ltd.

Registered to purchase the rights of F. W. Sedgwick, under an agreement made September 3rd, 1901, for the acquisition of 10 acres, or thereabouts, of brickfields, situate at Leatherhead, and to carry on the business of brick, tile and cement makers, builders, lead merchants, builders' merchants, cartage contractors, &c. Capital £9,000 in £1 shares. The first directors are F. W. Sedgwick (chairman), S. S. Sedgwick (as managing director) and W. H. M. Smith.

Tirbach Brick Co., Ltd.

Registered to carry on the business of clay workers, potters, firebrick, fireclay and general clay merchants, brick and tile merchants, builders' merchants, &c. Capital £6,000 in £25 shares (120 preference). Registered office : 12, Wind Street, Swansea.

British Estates Co., Ltd.

Registered to acquire estates to be divided into plots, and generally to carry on the business of contractors, builders, decorators, auctioneers, surveyors, house and estate agents, &c. Capital £10,000 in £1 shares. The first directors are T. N. Slack, W. Stewart and A. H. Shipherd. Registered office : 7, Union Court, Old Broad Street, E.C.

Pwllheli Granite Co., Ltd.

Registered to take over the business of quarry proprietors and stone merchants carried on by James and John Littler, at Pwllheli and Mingford, North Wales and at Runcorn, Cheshire. Capital £6,000 in £10 shares. The first directors are J. Littler and J. Bebbington, the former being permanent director and chairman.

Craven Coal Co., Ltd.

Registered to carry on the business of coal, coke and lime merchants, ironmasters, quarrymen, stone and slate merchants, brick, tile and pipe makers and merchants, &c. Capital £5,000 in £1 shares. The first directors are G. H. Walton, O. Bagley and C. H. Appleyard.

Martin Wells & Co., Ltd.

Registered to carry on the business of general and Government contractors and engineers, builders, house decorators, furnishers, house and estate agents, brick and tile makers, timber merchants, ironfounders, ironmongers, &c. Capital £50,000 in £10 shares. The first directors are H. Wells, J. H. Wells, P. H. E. Wells, A. Vint, R. H. Lloyd and J. Wells. Registered office : 133, Victoria Road, Aldershot, Hants.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	9	$10\frac{1}{2}$		—	
Clover, best	per load	4	5	0	5	10	0
Hay, best	do.	5	0	0	5	10	0
Sainfoin mixture ..	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	8	0	1	9	2
Colza Oil, English ..	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	11	0		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	$4\frac{1}{2}$		—	
Linseed Oil, barrels ..	do.	1	11	6		—	
Petroleum, American ..	per gal.	0	0	$6\frac{1}{4}$	0	0	$6\frac{3}{8}$
Do. Russian ..	do.	0	0	$5\frac{3}{4}$	0	0	$5\frac{1}{8}$
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	4	3	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	8	6		—	
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	6	6	1	6	9

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	80	0	0		—	
Iron, Staffs., bar ..	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	15	0	12	0	0
Lead, pig, Spanish ..	do.	12	1	3		—	
Do. do. English common brands	do.	12	8	9		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	6	10	0	7	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	113	2	6	113	12	6
Do. English ingots ..	do.	116	10	0	117	0	0
Zinc, sheets, Silesian ..	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	15	0	17	3	9

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	$10\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P.Std.	9	10	0	10	15	0
Do. do. 4th & 3rd	do.	7	5	0	10	15	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	11	0	0		—	
Do. do. 2nd "	do.	10	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	13	0	0		—	
Do. White Sea ..	do.	8	5	0	13	15	0
Do. Quebec Pine, 1st ..	do.	13	15	0		—	
Do. do. 2nd ..	do.	11	5	0		—	
Do. do. 3rd &c.	do.	9	15	0		—	
Do. Canadian Spruce, 1st	do.	17	0	0		—	
Do. do. 3rd & 2nd	do.	8	0	0	10	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	5	5	0	8	5	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	10	3		—	
Do. 2nd ..	do.	0	9	3		—	
Do. 3rd &c. ..	do.	0	7	3		—	

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	
Cedar, 1in., Cuba ..	per ft. sup.	0	0	$4\frac{5}{32}$		—	
Do. Honduras ..	do.	0	0	$4\frac{3}{32}$		—	
Do. Tobasco	do.	0	0	$3\frac{3}{4}$		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	$4\frac{1}{32}$		—	
Do. African ..	do.	0	0	3		—	
Do. St. Domingo	do.	0	0	$6\frac{3}{8}$		—	
Do. Tobasco ..	do.	0	0	$3\frac{29}{32}$		—	
Do. Cuba ..	do.	0	0	$5\frac{13}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ..	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1		—	

QUERIES ANSWERED

RESPECTING

Our Insurance Schemes.

From time to time we have queries addressed to us by readers on points affecting our Accident Insurance Schemes. The greater number of the queries relate to the conditions of payment, and to enlighten those who may still be in doubt we think it desirable to state

(1.) That it is not necessary to subscribe direct to the office in order to secure the benefits.

(2.) That even if ordered through a newsagent the subscription need not be prepaid for a year. It is sufficient to order it and pay as may be arranged with the newsagent.

(3.) It is sufficient to have an intimation from the newsagent that he supplies copies regularly.

(4.) That policies can be issued either direct to the subscriber or through the newsagent, whichever may be preferred.

(5.) In applying it is not necessary to write a long letter—a postcard will do, giving the full name and address of the newsagent from whom the copy is obtained.

There are **Three Schemes** of Insurance connected with our Papers, guaranteed by the OCEAN ACCIDENT AND GUARANTEE CORPORATION, LTD.

Scheme No. 1 is a free Accident Insurance of **£500.**

FREE.

(*Every regular reader of the Builders' Journal is entitled to this without any payment.*)

Scheme No. 2 is an Accident Insurance of **£500,** giving the following additional advantages :

Premium, 1/-

£250 for Permanent Total Disablement.

£2 10s. 0d. per week for Temporary Total Disablement.

(*For the conditions under which policies Nos. 1 and 2 are issued readers should refer to our pamphlet, sent on application.*)

Scheme No. 3 is an Accident Insurance of **£1,000,** with these additional advantages :

Ordinary Risks, Premium, £3/-/-

Hazardous Risks, Premium, £3/10/-

£500 for Permanent Total Disablement.

£6 per week for Temporary Total Disablement.

£1 10s. per week for Temporary Partial Disablement.

£30 Annuity.

£3 per week during confinement from such illnesses as Diabetes, Scarlet Fever, Carbuncle, &c., &c.

(*This is a most valuable policy, with advantages not to be had from any other insurance company.*)

If these schemes interest you, write for full particulars to

THE MANAGER OF THE
BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Oct. 4	Bexhill—Coastguard Buildings	—	Coastguard Station, Bexhill.
„ 4	Sheffield—Sandhouse, &c.	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
„ 5	Thornaby, Yorks—Additions, &c.	Police Station	County Surveyor's Office, Northallerton.
„ 5	Carrickfergus—Wall, &c.	Urban District Council	W. D. R. Taggart, 17A Donegall Street, Belfast.
„ 5	Hillsborough—Manse	Committee of Presbyterian Church	S. Stevenson, 83 Royal Avenue, Belfast.
„ 5	Hessle, near Hull—Pumping Station	North-Eastern Railway Co.	Stationmaster, Paragon Station, Hull.
„ 5	Spennymoor—Alterations to Market	—	R. F. Gowland, High Street, Spennymoor.
„ 7	Cheadle, Cheshire—Mortuary Buildings	Urban District Council	G. H. Brady, 18 Little Underbank, Stockport.
„ 7	Belfast—Two Semi-detached Villas	—	T. Houston, Architect, King's Court, Wellington Place, Belfast.
„ 7	Manchester—Cement, Bricks, &c.	Lancashire and Yorkshire Railway Co.	Stores Department, Osborne Street, Manchester.
„ 7	Woodside, near Croydon—School Buildings	St. Olave's Union Guardians	A. H. Newman, 31 Tooley Street, London Bridge, S.E.
„ 7	Erith—Iron Building	Urban District Council	Surveyor of the Council, Erith.
„ 7	Ilford—Wall, &c.	Urban District Council	H. Shaw, 7 Cranbrook Road, Ilford.
„ 7	Leeds—Extension of Shed	—	City Engineer's Office, Leeds.
„ 7	Aberdeen—Slates, Bricks, &c.	Harbour Trustees	Harbour Engineer's Office, Aberdeen.
„ 7	Camberwell—Stables	Borough Council	Borough Engineer's Office, Town Hall, Camberwell.
„ 7	Brading, I.W.—Public Hall	Town Trust	J. Newman, Thornton, Sandown.
„ 7	London, S.W.—Pulling Down and Removing Buildings	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
„ 8	London, S.W.—Dwellings	London County Council	Architect's Department, 18 Pall Mall East, S.W.
„ 8	Oldham—Generating Station	Electricity Committee	A. Andrew, Gas and Water Offices, Oldham.
„ 8	Selly Oak, near Birmingham—Wards, &c.	Guardians of Union	Mansell & Mansell, Quantity Surveyors, Colmore Row, Birmingham.
„ 8	Bridlington—Central Schools & Caretaker's Residence	United District School Board	J. Earnshaw, Architect, Bridlington.
„ 8	Sheffield—Public Baths and Library	Corporation	C. F. White, City Surveyor, Town Hall, Sheffield.
„ 8	Tooting, S.W.—276 Cottage Dwellings	London County Council	Housing Branch of Architect's Department, 18 Pall Mall East, S.W.
„ 8	King's Norton—Wards, Lodge, Pavilion, &c.	Union Guardians	Mansell & Mansell, Quantity Surveyors, Colmore Row, Birmingham.
„ 8	St. Annes-on-the-Sea—Warehouse, Offices, &c.	Directors of Railways	Engineer's Office, Hunt's Bank, Manchester.
„ 9	Barking, Essex—Lodge, &c.	Urban District Council	C. F. Dawson, Council's Surveyor, Public Offices, Barking.
„ 9	Belfast—Villa	—	Blackwood & Jury, 41 Donegal Place, Belfast.
„ 10	Arclid—Alterations to Workhouse	Congleton Union Guardians	A. Price, Architect, Elworth.
„ 10	Pontypool—Hospital	—	R. Williams, 10 Clifford Inn, Fleet Street, E.C.
„ 10	Winlaton—Houses and Boundary Wall	School Board	Liddle & Browne, Prudential Bdgs., Mosley St., Newcastle-on-Tyne.
„ 10	Halifax—Stabling	T. Ramsden & Son, Ltd.	W. H. D. Horsfall, Tower Chambers, Halifax.
„ 12	Devizes, Wilts—Visiting-room at Asylum	County Council	C. S. Adye, County Surveyor, County Offices, Trowbridge.
„ 12	Cheltenham—Town Hall	Corporation	E. T. Brydges, Town Clerk, Municipal Offices, Cheltenham.
„ 12	Farningham—School	School Board	J. H. Tait, Architect, Dartford, Kent.
„ 14	Belfast—Slates, Firebricks, &c.	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
„ 14	Beckenham—Two Cottages	Urban District Council	J. A. Angell, Surveyor, Beckenham.
„ 15	London, S.E.—Receiving Ward at Workhouse	Lambeth Parish Guardians	Fowler & Hugman, 9 Craig's Court, Charing Cross, S.W.
„ 15	Braintree—Cattle Market	Urban District Council	F. Whitmore, Architect, Chelmsford.
„ 15	Slough—Gasworks	Gas and Coke Co.	T. Webb, Engineer and Manager, Gas and Coke Co., Slough.
„ 15	Sligo—New Chapel	District Lunatic Asylum	Sir Thomas N. Deane & Son, 15 Ely Place, Dublin.
„ 16	Manchester—Police and Fire Station	Watch Committee	City Surveyor's Office, Town Hall, Manchester.
„ 16	Witham—Infants' School	School Board	W. P. Perkins, Surveyor to the Urban District Council, Witham.
„ 19	Sheffield—Baths and Library	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
	ENGINEERING:		
Oct. 5	Monaghan—Waterworks	Urban District Council	J. L. Devenish-Meares, Town Hall, Newry.
„ 5	Bideford—Sewers, Water Main, &c.	Corporation	B. Lasham, Parliament Mansions, Victoria Street, Westminster.
„ 7	Londonderry—Waterworks	Council	J. J. S. Barnhill, 1A Strand, Londonderry.
„ 7	Rawmarsh, Yorks—Repairs to Mains	Urban District Council	Surveyor, Council Offices, Rawmarsh.
„ 7	Stirling—Waterworks	Central District Committee	County Sanitary Inspector's Office, 48 Barnton Street, Stirling.
„ 8	Bridlington—Heating, &c.	School Board	J. Earnshaw, Architect and Surveyor, Bridlington.
„ 8	Leeds—Switchboard	Lighting Committee	H. Dickinson, 1 Whitehall Road, Leeds.
„ 8	London, S.W.—Electric Lifts, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 8	London, S.W.—Tramways	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 8	London, S.W.—Continuous Current Plant	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 9	Manchester—Cables	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
„ 9	Newhaven, Sussex—Penstock, &c.	Urban District Council	F. J. Rayner, Town Surveyor's Office, Newhaven.
„ 10	Halfway Street, near Sidcup, Kent—Electric Lighting	Guardians of Union	T. Dinwiddy, 12 Croom's Hill, Greenwich, S.E.
„ 10	Greenwich—Engineering Works	Guardians	T. Dinwiddy, 12 Croom's Hill, Greenwich, S.E.
„ 11	Welburn—Water Supply	Rural District Council	R. Richardson, EngineerCouncil, Town Hall, Malton.
„ 11	Malton, Yorks—Waterworks	Rural District Council	R. Richardson, Engineer, Town Hall, Malton.
„ 12	Aspatria, Cumberland—Waterworks	Joint Water Board	Pickering & Crompton, 11 Lowther Street, Whitehaven.
„ 12	East Donyland, Essex—Borehole	Rural District Council	Sands & Walker, Angel Row, Nottingham.
„ 14	Kirkcaldy—Switchboard	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 14	Colchester—Hot-water Apparatus	Guardians	Master at the Workhouse, Colchester.
„ 15	Leeds—Motor Cars	Corporation	T. Hewson, City Engineer, Municipal Buildings, Leeds.
„ 15	Buckfastleigh, Devon—Waterworks	Urban District Council	T. W. Stainthorpe, Gate House, Totnes, Devon.
„ 15	Rochdale—Gravitation Main	Corporation	J. Mansergh, 5 Victoria Street, Westminster.
„ 15	Fishguard, Pembrokeshire—Extension of Pier	Railways and Harbours Company	Secretary, Paddington Station, London.
„ 19	Annalong, co Down, Ireland—Harbour Improvements	Down County Council	County Surveyor, Court House, Downpatrick.
„ 21	Youghal—Ventilating Apparatus	District Lunatic Asylum	H. A. Cutler, Municipal Buildings, Cork.
„ 21	Newport, Mon—Winches, &c.	Corporation	H. F. Parshall, 8 Princes Street, Bank, London, E.C.
Nov. 26	East London, South Africa—Electric Plant	—	Dyer & Dyer, 17 Aldermanbury, E.C.
Dec. 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works, Sydney.
	IRON AND STEEL:		
Oct. 4	Ashton-in-Makerfield—Fencing	Urban District Council	J. W. Liversedge, Surveyor, Public Offices, Ashton-in-Makerfield.
„ 7	Ilford—Gas Fittings	School Board	C. J. Dawson, 7 Bank Buildings, Ilford.
„ 7	Leeds—Ironwork	—	City Engineer's Office, Leeds.
„ 7	Aberdeen—Ironmongery	Harbour Trustees	Harbour Engineer's Office, Aberdeen.
„ 7	Manchester—Iron Castings, &c.	Lancs and Yorks Railway Company	Stores Department, Osborne Street, Manchester.
„ 14	Dublin—Rails, &c.	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
„ 14	Belfast—Iron and Steel Castings	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
Nov. 11	London, S.W.—Rails, &c.	—	Agent-General for Victoria, 15 Victoria Street, London.
	PAINTING AND PLUMBING:		
Oct. 5	Cockermouth—Water Main, &c.	—	I. Irving, Master at Flimby Lodge, Cockermouth.
„ 7	Aberdeen—Plumbers' Work	Harbour Trustees	Harbour Engineer's Office, Aberdeen.
„ 12	Bradford—Painting, &c.	School Board	Architect, School Board Office, Bradford.
„ 14	Belfast—Paints, &c.	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
„ 14	Knutsford—Painting and Limewashing	Bucklow Union Guardians	R. J. McBeatt, Architect, Birnam House, Sale.
	ROADS AND CARTAGE:		
Oct. 4	Horbury, Yorks—Levelling, &c.	Urban District Council	C. R. Spencer, Engineer and Surveyor, Council Offices, High Street, Horbury.
„ 7	Jarrow—Asphalt Footpaths	Urban Sanitary Authority	Borough Surveyor, Jarrow.
„ 7	Teddington—Road Works	Urban District Council	M. Hainsworth, Surveyor, Teddington.
„ 7	Aberdeen—Stones and Road Metal	Harbour Trustees	Harbour Engineer's Office, Aberdeen.
„ 7	Cradley Heath, Staffs—Granite	Urban District Council	A. Homfray, Clerk, Cradley Heath.
„ 8	London, N.—Granite Sets	Edmonton Urban District Council	J. E. Eachus, Engineer to the Council, Town Hall, Lower Edmonton.
„ 8	Willesden—Roadmaking and Paving	District Council	C. C. Robson, Engineer to the Council, Public Offices, Dyne Road, Kilburn, N.W.
„ 9	Old Hill, Staffs—Reinstating Roadways	Royley Regis Urban District Council	Council Offices, Lawrence Lane, Old Hill.
„ 9	London, S.W.—Tar-Paving Materials	London County Council	Parks Department, 11 Regent Street, S.W.
„ 12	Cockermouth—Widening	Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
„ 14	Hanwell—Broken Granite	Urban District Council	P. J. Dennis, Clerk, Urban District Council Offices, Hanwell, W.
Nov. 30	Johannesburg—Pavements	—	"The Times," London, E.C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY;		
Oct. 7	Woodford, Essex—Sewer	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 7	Surbiton—Drains	Urban District Council	Council Offices, Ewell Road, Surbiton.
" 7	Hale, Cheshire—Drains	Urban District Council	F. J. Lobley, Ashley Road, Hale, Cheshire.
" 8	Bradford—Scavenging	Cleansing Committee	J. McTaggart, Destructor Works, Hammerton Street, Bradford.
" 8	Erith—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
" 10	Salford—Sewers, &c.	——	Borough Engineer's Office, Town Hall, Salford.
" 11	Malton, Yorks—Drainage Works	Rural District Council	R. Richardson, Engineer, Town Hall, Malton.
" 12	Dovenby, nr. Cockermouth—Sewerage Works	Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
" 14	Hastings—Sewer, &c.	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
	TIMBER:		
Oct. 7	Aberdeen—Timber	Harbour Trustees	Harbour Engineer's Office, Aberdeen.
" 14	Belfast—Logs, Deals, &c.	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 21	Leeds—Public Baths at Junction of Calveley and Broad Lanes, at cost not exceeding £8,000.	£30, £20, £10 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
" 21	Leeds—Public Baths and Branch Free Library in York Road, at cost of £15,000.	£50, £30, £15 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
" 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
" 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
1902. Sept. 1–14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ALDERSHOT.—For the erection of five houses, Aldershot, for Mr. W. Warren. Messrs. Friend & Lloyd, architects and surveyors, Aldershot, Hants:—

Drowley & Co., Woking	£2,920
J. W. Gunstone, Aldershot	2,299
Batemans & Sons, Ash	2,075
C. Liley,* Aldershot	1,656

* Accepted.

BARNSLEY.—Accepted for the following works, for the Barnsley Town Council:—(Section 1) erection of an entrance lodge: (2) a new main ward block to contain 28 beds, with duty room, heating chamber, heating apparatus, &c.; (3) additions to administrative block: (4) additions to laundry; (5) fence walls, &c. Mr. J. Henry Taylor, M.I.C.E., borough surveyor, Manor House, Barnsley:—

Section 1.		
G. Mellor, brickwork	£336	0
J. Smith, carpenter, &c.	195	0
Fleming, plasterer	54	10
Fleming, slater	36	10
J. Snowden, smith and founder and plumber and glazier	112	0
Section 2.		
G. Mellor, brickwork	1,012	0
A. Owram, carpenter, &c.	555	0
T. Lindley, plasterer	178	5
Fleming, slater	120	0
B. Dennison, smith and founder and plumber and glazier	205	9
Section 3.		
G. Mellor, brickwork, &c.	881	0
A. Owram, carpenter, &c.	725	0
Fleming, slater	194	10
Fleming, plasterer	177	0
B. Dennison, smith and founder and plumber and glazier	200	12
J. Snowden, hot-water engineer	215	0
Section 4.		
G. Mellor, brickwork, &c.	159	0
A. Owram, carpenter, &c.	75	0
T. Lindley, plasterer	10	8
Fleming, slater	38	0
B. Dennison, plumber and glazier	27	6
Section 5.		
G. Mellor, brickwork	325	0

NOTE.—The above tenders do not include the supply of machinery and apparatus for the laundry, the making of roads, terraces, and sewers, painting, or the supply of furniture and fittings for light.

BRIGHTON.—For the erection of 30 four-roomed artisans' dwellings in Dewe Road, Lewes Road, Brighton, for the Town Council. Mr. Francis J. C. May, M.I.C.E., F.S.I., borough engineer:—

Sattin & Evershed, Freshfield Road, Brighton	£6,990
W. Turnbull & Co., Lumley Road, Horley	6,577
F. Clarke, 92 North End, Croydon	6,412
Norman, French & Co., 42 Thorne Street, Barnes	6,090
R. Mitchell & Co., 8 Bates Road, Brighton	6,075
S. & W. Simmonds,* Hythe Road, Brighton	5,990
J. A. Mordecai, White Hart Lane, Tottenham	5,700

* Accepted.

CAMBRIDGE.—Accepted for the erection of cemetery buildings for Cambridge Corporation. Mr. A. Paul Macalister, A.R.I.B.A., architects, 3 St. Andrew's Street, Cambridge:—

Oak Building Co., Hills Road, Cambridge	£1,585

COTGRAVE (NOTTS.).—For the erection of new Wesleyan Church, Cotgrave, Notts. Mr. A. E. Lambert, architect, 32 Park Row, Nottingham:—

A. E. Smith, Nottingham	£1,375	0	0
H. Green & Sons, Nottingham	1,368	10	0
T. Cuthbert, Nottingham	1,330	0	0
J. Walker, Bingham	1,324	0	0
W. Mawle, Nottingham	1,205	0	0
J. Lewin, Netherfield, Notts	1,166	0	0
G. T. Tegerdine, Carlton, Notts	1,149	0	0
J. Musson, Nottingham	1,133	7	6
T. Barlow,* Nottingham	1,090	0	0

* Accepted.

ENFIELD.—For the erection of a junior mixed school at Chesterfield Road, Enfield Lock, for the Enfield School Board. Mr. G. E. T. Laurence, architect, 22 Buckingham Street, Adelphi, W.C.:—

For buildings complete for 540 children.

J. & M. Patrick, Wandsworth, S.W.	£10,050	0
P. Banyard, Cambridge	9,937	10
C. G. Hill, Coventry	9,535	0
C. H. Hunt, High Wycombe	9,391	0
Treasure & Son, Holloway	9,231	0
Martin, Wells & Co., Vauxhall, S.E.	9,054	0
A. Porter, High Road, Tottenham	9,002	0
A. & B. Hanson, Southall, Middlesex	8,892	0
A. F. Almond, Enfield Highway	8,761	0
A. Monk, Lower Edmonton	8,599	0
H. Knight & Son, Tottenham	8,521	0
T. Almond & Son, Ponder's End	8,409	0
J. Chessum & Sons, Bow, E.	8,375	0
R. L. Tonge, Watford	8,181	0
W. Lawrence & Son, Waltham Abbey	8,149	0
A. Fairhead & Son,* Enfield	8,093	0

For buildings complete for 420 children.

J. & M. Patrick	9,431	0
P. Banyard	9,421	0
C. G. Hill	9,020	0
C. H. Hunt	8,798	0
Treasure & Son	8,650	0
Martin, Wells & Co.	8,493	0
A. Porter	8,440	0
A. & B. Hanson	8,310	0
A. F. Almond	8,190	0
A. Monk	8,069	0
H. Knight & Son	7,996	0
T. Almond & Son	7,891	0
J. Chessum & Sons	7,837	0
R. L. Tonge	7,650	0
W. Lawrence & Son	7,640	0
A. Fairhead & Son	7,568	0

* Accepted subject to the approval of the Board of Education.

LONDON, S.E.—For work to be done in connection with the extension of the kitchen accommodation at Prince's Road Workhouse for the Guardians of Lambeth:—

Castle Bros., Newcomen Street, Borough	£1,177
J. Parsons, 190 Waterloo Road, S.E.	1,075
H. Kent, 17 Albion Road Lewisham	1,069
J. Westbrook, Water Lane, Thornton Heath	1,050
W. Pearce, Whitehall Road, Thornton Heath	1,025
H. Bragg & Sons,* 66 Robsart Street, Brixton, S.W.	960

* Accepted.

LONDON, W.—For sewering, levelling, paving, metalling, flagging, channelling, providing means of lighting, and making up the following streets for the Hanwell Urban District Council, viz.: (1) Elthorne Avenue; (2) Elthorne Park Road; (3) Holly Park Road. Mr. S. W. Barnes, surveyor:—

Elthorne Road.

A. Green	£1,377	0	0
Mowlem & Co.	1,171	12	8
R. Ballard	1,166	8	0
Nowell & Co.	1,146	14	4
G. Wimpey & Co.	1,092	4	3
W. H. Wheeler	1,075	19	10
Felkin & Watson	1,074	0	0
J. Ball	1,034	12	5
J. Macklin	1,011	16	9
W. Neave & Son*	968	0	0

[Surveyor's estimate, £1,080 19s. 2d.]

Elthorne Park Road.

A. Green	£1,143	3	0
R. Ballard	967	8	0
Mowlem & Co.	965	0	10
Nowell & Co.	943	0	0
G. Wimpey & Co.	924	16	3
Felkin & Watson	887	10	0
W. H. Wheeler	882	4	7
J. Ball	872	8	8
J. Macklin	850	5	0
W. Neave & Son*	806	0	0

[Surveyor's estimate, £907 1s. 6d.]

Holly Park Road.

A. Green	£715	14	0
Nowell & Co.	598	12	6
R. Ballard	594	2	0
Mowlem & Co.	588	3	3
G. Wimpey & Co.	584	0	0
W. H. Wheeler	579	4	9
J. Macklin	551	4	6
J. Ball	548	17	8
Felkin & Watson	545	0	0
W. Neave & Son*	502	0	0

* Accepted. [Surveyor's estimate, £594 19s. 5d.]

LONDON, W.C.—For the erection of casual wards in Little Gray's Inn Lane, Gray's Inn Road, W.C., for the Guardians of Holborn Union. Messrs. Smith & Coggin, architects, York Buildings, Adelphi, W.C.:—

J. Smith & Sons, Junction Works, South Norwood	£11,343	0	0
Staines & Son, 61 Great Eastern Street, E.C.	11,300	0	0
C. G. Hill, 90 & 91 Queen Street, Cheapside	11,146	0	0
Johnson & Son, Leicester	11,030	7	6
A. Bush, 6A, Ridgmount Street, W.C.	11,009	0	0
B. E. Nightingale, Albert Works, Albert Embankment	10,788	0	0
W. Smith and Sons, 202 London Road, Croydon	10,740	4	6
W. Wallis, 23 Ramsden Road, Balham	10,595	0	0
Patman & Fotheringham, 100 Theobald's Road, W.C.	10,593	0	0
H. Wall & Co., Carlton Works, Kentish Town, N.	10,491	0	0
F. & F. H. Higgs, Station Works, Loughborough Junction	10,382	0	0
H. L. Holloway, Union Works, Church Street, Deptford	10,358	0	
Prestige & Co., Cambridge Wharf, Grosvenor Road	10,353	0	0
F. G. Minter, Ferry Works, Page Street, Westminster	10,163	0	0
Foster Bros, 148 Birchanger, Norwood Junction	10,161	0	0
Martin, Wells & Co., Auckland Street, Vauxhall, S.E.	10,134	0	0
Davis & Leaney, Southend-on-Sea	9,921	15	0
J. Richardson, 41 Albert Road, Peckham	9,783	0	0
W. Reason, 47 Rosebery Avenue, W.C.	9,615	0	0
W. Lawrence & Son,* Canal Works, Waltham Abbey, N.	9,372	0	0

* Accepted.

PEMBURY (KENT).—For main drainage works at Pembury for the Tonbridge Rural District Council:—

Peerless & Dennis, Eastbourne	£14,429
Strange & Sons, Tunbridge Wells	13,735
Johnson & Langley, Leicester	13,118
Lowes Syndicate, Ltd., London	12,217
S. Kavanagh, Surbiton	11,895
W. Jones & Sons, Poole	11,562
C. W. Killingback & Co., Camden Town	11,371
Brisby & Co., Dover	10,787
Punnett & Son, Tonbridge	10,720
J. & T. Benns, Croydon	10,634
J. Jarvis, Tunbridge Wells	10,490
E. Osenton, Westerham	9,810
T. Denne, Walmer*	9,750
L. Beale & Son,* Tunbridge Wells	9,341
Streeter & Todhunter,† Godalming	8,567

* Not including making-up roads. † Accepted.

ROYSTON (HERTS.).—For the erection of a new isolation hospital. Mr. A. Paul Macalister, A.R.I.B.A., architect, 3 St. Andrews Street, Cambridge. Quantities by Mr. E. D. Nixon, surveyor, 9 Gray's Inn Square:—

Bell & Sons, Cambridge	£4,270
Oak Building Co.	4,096
F. T. Bailey	3,930
Coulson & Lofts, Cambridge	3,823
Thackray & Co., Huntingdon	3,745
Th. Coleman, Bradford	3,663
Gimson & Co., Royston	3,577
Hinkins, Royston	3,518
Stones & Skelton, Biggleswade	3,489
Jacklin, Royston	3,371
Ward & Sons, Melbourn	3,314

[Architect's estimate, £3,255.]

SHANKLIN (ISLE OF WIGHT).—For building two groynes for the Urban District Council:—

Case Sea-Defence Syndicate	£5,530	9	1
H. M. Patrick, Wandsworth	2,219	0	0
B. Cooke & Co., Westminster	2,200	0	0
F. Hayden & Son,* Sandown	1,950	0	0

* Accepted.

WOLVERHAMPTON.—For the erection of Industrial Hall at the forthcoming exhibition:—

J. Bowen & Sons, Birmingham	£13,960
J. Barnsley & Sons, Birmingham	13,680
H. Lovatt	12,700
H. Willcock & Co.	12,158
E. J. Charles, Birmingham	11,920
H. Gough	11,900
F. Lindsay Jones* (exclusive of dome)	10,575

[Rest of Wolverhampton.]

* Accepted at £9,850 after revision of the design by omission of the proposed dome over industrial hall.

WOLVERHAMPTON.—For the erection of Machinery Hall at the forthcoming exhibition:—

T. Skett	£8,795	E. C. Charles, Birmingham	£7,460
J. Bowen & Sons, Birmingham	8,593	H. Willcock & Co.	7,351
F. Lindsay Jones	7,998	H. Gough	7,350
H. Lovatt	7,981	J. Herbert*	7,297
G. Cave	7,732		

* Accepted. [Rest of Wolverhampton.]

COMING EVENTS.

Wednesday, October 2.

National Association of Master House Painters and Decorators.—Convention at Leicester (Second day). Mr. Walter Crane on "Some Thoughts on House Decoration," at 10 a.m Mr. Fletcher on "The Value of Design and Reticence in Decoration," at 3 p.m.

City of London College Science Society.—Presidential Address by Prof. G. S. Boulger, F.L.S. 7.30 p.m.

Thursday, October 3.

National Association of Master House Painters and Decorators.—Convention at Leicester (Third and last day). Annual Excursion to Belvoir Castle, and Annual Dinner at King's Hall, Grand Hotel, Leicester, at 7 p.m.

Royal Institute of British Architects.—Meeting at Glasgow (First day). Annual Dinner at the Windsor Hotel, at 6.30 p.m.

Friday, October 4.

Royal Institute of British Architects.—Meeting at Glasgow (Second day). Informal visit to the Exhibition and Visit to the University. Conversazione at City Chambers in evening.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Wright Clarke on "Details of Plumbers' Work," 7 p.m.

Saturday, October 5.

British Institute of Certified Carpenters (Carpenters' Hall, London Wall, E.C.).—Mr. W. T. Sweett on "Modern Joinery," 6 p.m.

Monday, October 7.

Society of Engineers.—Mr. Sydney A. Hollis on "Preliminary Investigations for Water Supply," 7.30 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. R. Elsey Smith, A.R.I.B.A., on "Building Materials," 7 p.m.

Liverpool Architectural Society.—Opening Address by the President, Prof. F. M. Simpson, 6 p.m.

Tuesday, October 8.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. R. Elsey Smith, A.R.I.B.A., on "Sanitary Building Construction and Planning: Soil, and Local Physical Conditions," 7 p.m.

Thursday, October 10.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Ventilating, Warming and Lighting," 7 p.m.

Friday, October 11.

Architectural Association.—Annual General Meeting. Presidential Address and Annual Distribution of Prizes by Mr. W. Howard Seth-Smith, F.R.I.B.A., 7.30 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Calculations, Measurements, and Plans and Sections," 7 p.m.

Saturday, October 12.

Northern Architectural Association.—Visit to New Castle Breweries Premises, Haymarket, and Electric Power Station, Newcastle.

A New Mission Church at West Bromwich, to be dedicated to the Good Shepherd, is being erected in Spon Lane. It will consist of an exterior porch and mission hall 51ft. by 27ft., and there will also be a large chancel, organ chamber and vestry. The building is being erected on the site in such a position as to allow of a permanent church being built on the land adjoining, which will be commenced as soon as funds will permit, after which the mission church will be used for Sunday school and parochial purposes. The church will provide accommodation for 304 persons, including the choir. The builder is Mr. T. Hardy, of West Bromwich, and the architects are Messrs. Wood & Kendrick.

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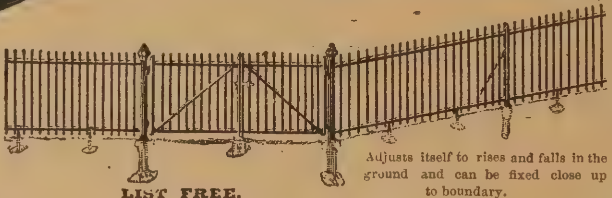
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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

OCT. 9, 1901.
NO. 348.

EFFINGHAM HOUSE,
ARUNDEL STREET,
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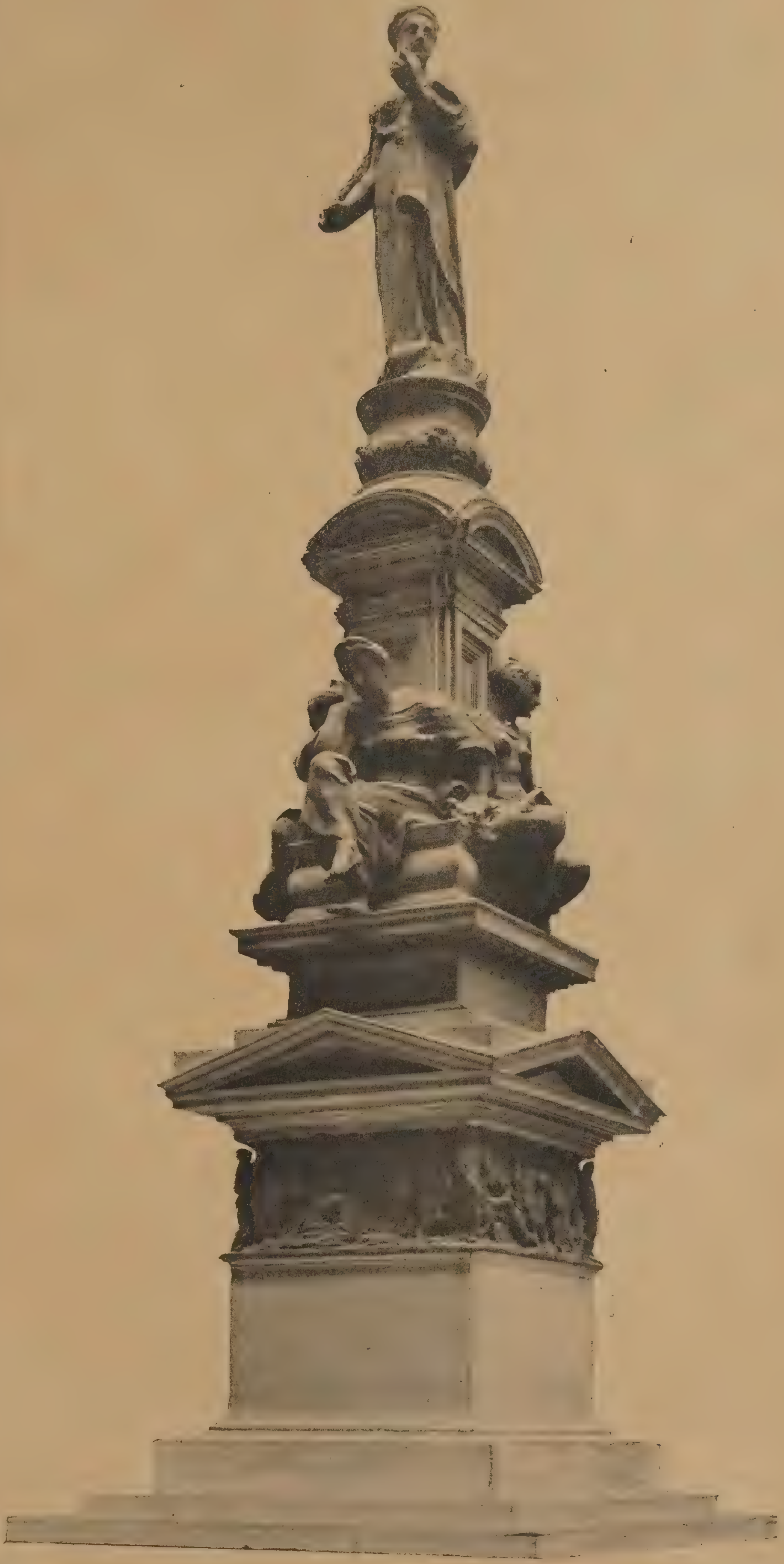
An Architectural Causerie.

The Queen Victoria Memorial. FOR the moment the interest in the Queen Victoria Memorial lies fallow, but it will be re-awakened this month by the public exhibition of the designs made by Mr. Aston Webb, Mr. T. G. Jackson, Mr. Ernest George, Dr. Rowand Anderson and Sir Thomas Drew. As everyone knows, the work is to be carried out by Mr. Brock and Mr. Aston Webb, but it will be interesting to compare the selected design with those of the other four architects; and it will also be of service to extend the comparison to Alfred Stevens's memorial of the Exhibition of 1851, the small model of which in South Kensington Museum is here illustrated.

Emperor William and the Fountains. WE believe that the members of that august body the Royal Academy were not particularly pleased when our own King claimed the whole of one of their walls for M. Constant's picture of Queen Victoria, but the regal authority in matters of art is much more extensively and vigorously exercised by Emperor William, of whom we once heard it said that "it would be a good thing for Germany when he was ten years older." As our readers are doubtless aware, the city architect of Berlin, Herr Hoffman, has designed three fountains for the Friedrichshain Park in the north-east of the city, but the Kaiser has refused to sanction their erection because he considers that their ornamentation, which illustrates well-known German fairy-tales, is too garish and showy. At last Wednesday's meeting of the Permanent Art Committee of the Berlin City Council the matter was discussed, every effort being made to avoid reference to the political side of the question and to treat it simply from an artistic standpoint. An examination of the previous designs for the fountains showed that while the various artists differed in detail they were almost unanimous in giving to subjects from fairy-tales a bold effect which the Kaiser condemns. Although no resolutions were taken, it was evident from the tone of the meeting that the Committee desire to harmonize the artistic views of the Kaiser with those of the city architect. What will ultimately be done remains to be seen. We may say, however, that if these designs savour at all of that altogether objectionable novelty which characterises modern German art and architecture—and we suspect as much—the Kaiser's objections would have our hearty support. This, however, is not the prevailing feeling about the matter in Berlin; it certainly was not that of the artist Dietz who caricatured his Emperor in "Simplicissimus"—a disgusting publication—for which little matter he will be confined in a fortress during the next eight months.



MODEL OF THE MEMORIAL OF THE GREAT EXHIBITION OF 1851. BY ALFRED STEVENS.

Boot-blacking at Chichester. MR. EDWARD S. PRIOR has made known in a letter to the "Times" the boot-blacking operations which have been carried out at Chichester Cathedral in order to "smarten it up" for the visit of the Church Congress on Saturday last. These are the facts: The Purbeck columns have had the patina of age smoothed away and varnished into blackness. While this lasts it will be to most eyes a blot on the texture of the marble, but, as at Lincoln and Salisbury, a scaling and sweating will follow on the re-polishing of the Purbeck, and afterwards the shafts will regain their surfaces. But this is not all, for the carved capitals have been polished too; and since their intricacies yielded reluctantly to the processes of the upholsterer, they needed to be "gritted and snaked" to make a Congress spectacle. At every touch of the polisher they lost that clean arris and delicate surfacing which was given them 700 years ago by the Purbeck sculptor and had lasted till to-day. The recent sculptors' work of the cathedral has been smartened also. Just as the nineteenth-century sculptor eighty years ago pared down the fourteenth-century effigies to make them tidy, so now the turn has come for him. This completes the catalogue. The facts need no comment, but they would form an inspiring addition to "Highways and Byways in Restoration." There seems to be an opportunity for a modernised edition of Dante, considered architecturally.

To kill the Jerry-Builder. ALL October is being allowed to the 68,000 members of the Amalgamated Society of Carpenters and Joiners to ballot on the scheme for starting co-operative building and joinery works in various parts of the country; the first one to be in the Midlands. The benefits to accrue are understood to be the raising of the members' status by establishing a standard wage in all districts where the works are in operation, and the settlement of disputes by the society offering to complete the jobs themselves; and indirectly it is thought that the scheme will kill the jerry-builder. Mr. Walter Crane spoke last week of those "small brick boxes with slate lids" with which everyone is familiar. Well, provided the boxes are soundly built and the lids fastened on tightly, there is not much harm done. It is when the wind blows in around the window-frames and the water comes trickling down the walls that we need to damn the jerry-builder and his methods. His is always a money speculation, and his idea is not to build houses for people to live in but houses to sell profitably. His doom would therefore come as a welcome; and if the carpenters and joiners can do this while carrying out their calling honourably they will confer a great benefit on the community.

JOHN JAMES BURNET, A.R.S.A.

MEN WHO BUILD.

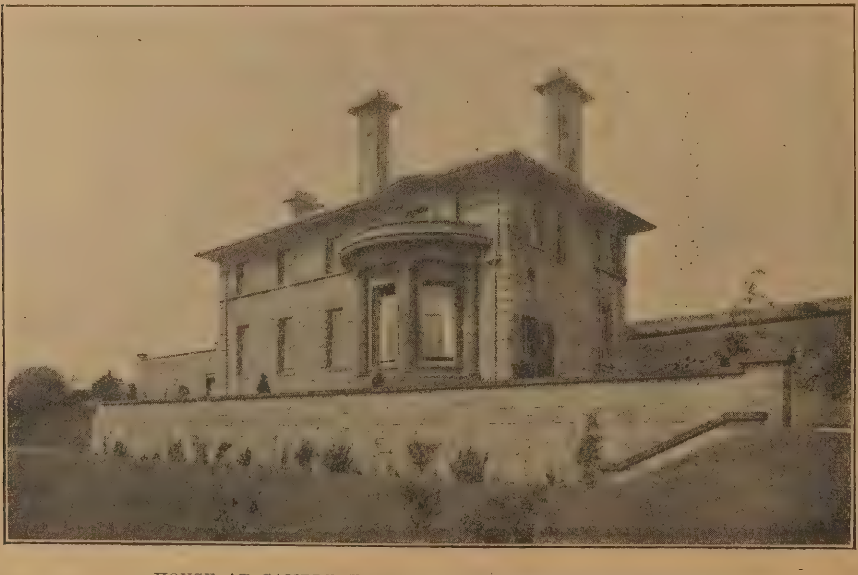
No. 65.—JOHN JAMES BURNET, A.R.S.A.

IT is remarkable that Glasgow—that ugly dirty city of commerce—should possess so many capable artists and be concerning itself so much about Art. This is undoubtedly due in a large measure to a natural reaction from the commercialism, but it would be as nothing were it not for the fact that the public taste of the city has been educated by a few artists, and architects have naturally exerted the most pronounced influence by reason of the insistence of their buildings. Glasgow, though the second city in the Empire, is not unwieldy, and being a new one the taste of its citizens has not been made bizarre by intercourse with many fashions; moreover, because of its comparatively small area, the surrounding country is easily accessible and not relegated to an unimpressive distance. The old buildings of Glasgow are few and insignificant, the Cathedral (which does not dominate the town, as generally happens) being an inferior specimen of the period. Then, again, the city having at first sought only one object—that of commerce—has a fine substratum of the imaginative to act as a background for the placing of grandiloquent buildings. The public taste of Glasgow had, in fact, been deadened by the commercialism, and it only needed to be quickened into real life in order that it might advance the more rapidly in art. That the reaction would go too far in the opposite direction might be expected, and we see all the ultra-emotional "swirl and blob" trash of the "L'Art Nouveau" class proceeding from Glasgow's art schools; and also from several firms of artists whose advertising methods are somewhat amusing, as they show the absurdity of art as a commercial trade-system by carrying it to its logical extreme. It is to be hoped that this tendency—very harmful, if continued—may be checked by the sobriety of the Scotch character; but one of the most distressing facts is that the rubbish should even contaminate architecture, it unfortunately affording an easy method for the ignorant to make a show.

Among the foremost of the educators of public taste in Glasgow must be reckoned the Burnets, father and son. The latter, Mr. John James Burnet, possesses a temperament peculiarly suited to such a work—masterful, self-reliant, energetic and impulsive, a character that is easily read in the portrait at the head of this a ticle. His personality is marked, yet he is withal free of those attributes of extremes and impracticabilities which so often characterise such men. The thorough knowledge of architectural subjects which he possesses was gained from the manner of his training abroad and under his father.

Mr. Burnet's particular notion in regard to what architecture should consist in is that the architect should be a poet as it were, phrasing the parts of a building into one harmonious whole expressive of the subject, the time and the public; this he illustrates by citing Rudyard Kipling. The theory is undoubtedly true of the architect, but doubtful in its application to architecture, which is a co-operative product and only reaches its highest levels when all the units in its development coalesce. Mr. Burnet's notion, however, gives us a clue to his work. We find his personality expressed throughout all his designs, which we esteem correspondingly. His position is the same as that of every self-respecting architect, from the Renaissance (and presumably before—at least in Greece and Egypt) to the present day. That poets should express the ideals of their country and their time unerringly would never be expected by anyone competent to speak; and it is equally absurd to expect architects (using the word in its present-day sense) to do the same—they are themselves first and other people afterwards. According as their view, so is the pleasure which they give to those who are intellectually or artistically of a similar bent. Now Mr. Burnet's personality, as we have already said, is marked, and his work must pre-eminently be measured by it, in the same way as the works of Robert Adam, Butterfield, Pugin, Street and Barry, to mention a few names, are measured by theirs. Incidentally of course these men made discoveries and solved problems of scientific fact-interest to us, but their chief claim to anything more than ephemeral notoriety is their personality.

Mr. Burnet's work is very distinctive, having a virile strength characteristic of the man, and to understand it properly we need to know something of his career. He was born in 1859. He was educated during 1874-77 at L'Ecole des Beaux-Arts, where he was trained as an engineer as well as an architect. This step was then an uncommon one with English architects, but the efficiency of the school and the advantages of its methods have now been generally recognised; its benefit to Mr. Burnet is apparent. American architects have largely availed themselves of this school and have been soundly rated for adopting French detail, but any little trace which Mr. Burnet retained has worn off in the course of time, though the neo-Grec, then in full swing, can be seen comparatively strong in his first works—the Royal Institute of Fine Arts in 1881 and the offices of the Clyde Navigation Trust in 1886. But this influence gradually weakened, until in the front of the Glasgow Athenæum to St. George's Place, erected in 1889, his early academical manner ended. This latter building is most admirable for its free and yet

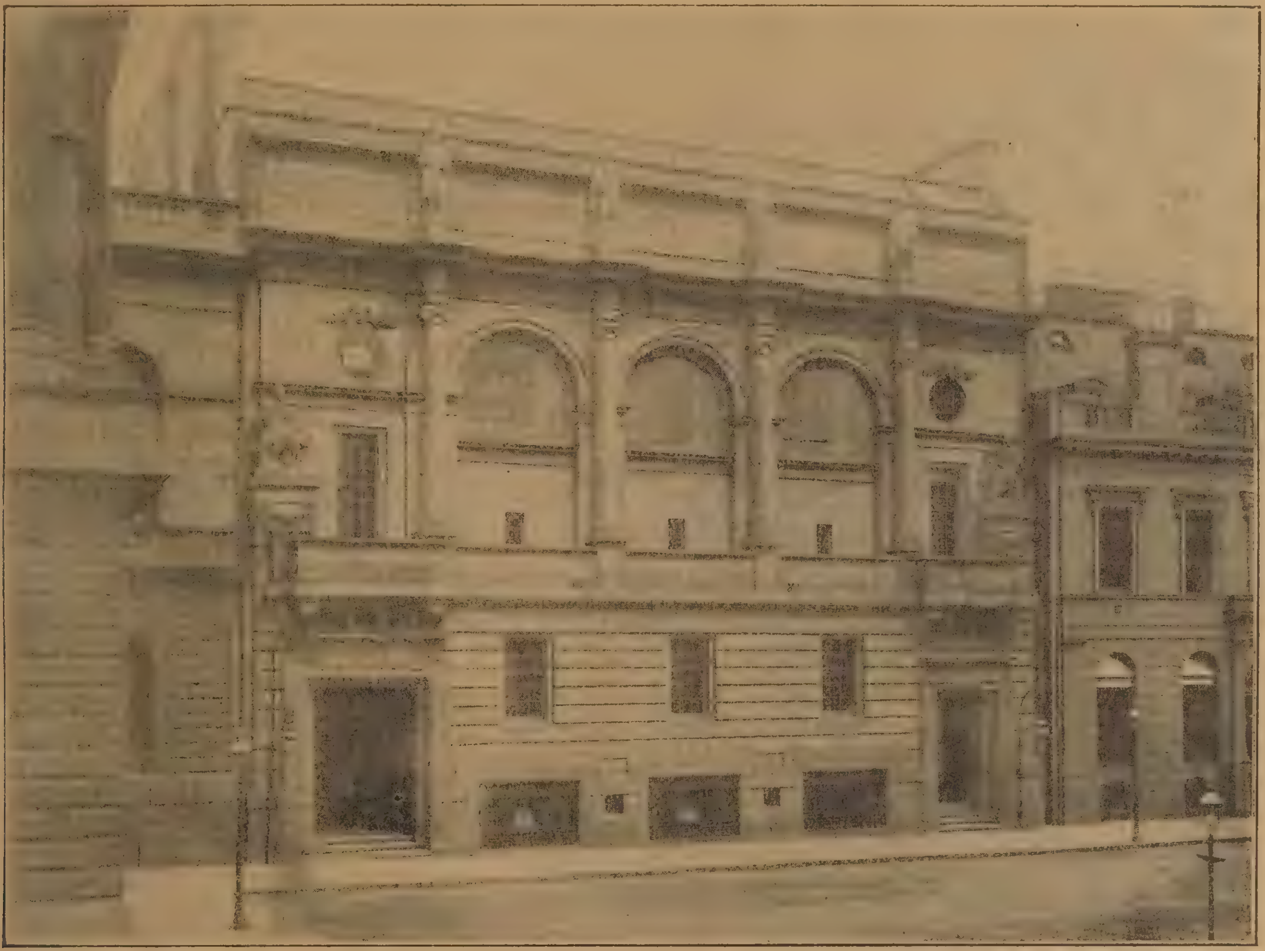


HOUSE AT CAMPBELTOWN. JOHN J. BURNET, ARCHITECT.

most reserved treatment, and is entitled to rank with any Classic building in Glasgow. The interior is surprisingly well carried out for one so young as Mr. Burnet was at that time.

He travelled and studied in Italy and France in 1878, and on his return became associated with his father, the late Mr. John Burnet, and the firm is still carried on under the style of John Burnet & Son. We may mention here that Mr. Burnet is a man of catholic education and tastes, and travelled and studied in Germany and Italy in 1895 and in America in 1896.

In addition to the above-mentioned buildings, while nominally associated with his father he was solely responsible for Deanston House, Doune, built in 1883, and the Edinburgh Exhibition buildings. From this time the following must be ranked as Mr. Burnet's most important works: The Barony Church, Glasgow (1890); Glasgow Western Infirmary Extension (1892-98); Parish Church, Arbroath (1897); Gardner Memorial Church, Brechin (1898); McLaren Memorial Church, Larbert (1900); Atlantic and Waterloo Chambers, Glasgow (1900); and Parish Church, Rutherglen (1901). The Atlantic and Waterloo Chambers show a novel treatment of the street-shop problem, and its effect can be gauged by the amount of copying already done or being done, particularly by those of the modern Glasgow Arts and Crafts school, who pride themselves upon their originality. The Waterloo Chambers would undoubtedly gain much by having the two extra storeys which it was originally designed to have. The new front of the Athenæum, illustrated on page 140 of this issue, exhibits another treatment of a narrow street-frontage in which the vertical is emphasised instead of the horizontal. The former is appropriate where there are sufficient supports on the ground floor; the horizontal trabeated treatment, on the other hand, is suggestive of the beams hidden behind the face.



THE ATHENÆUM, GLASGOW: FRONT TO ST. GEORGE'S PLACE. JOHN J. BURNET, ARCHITECT.

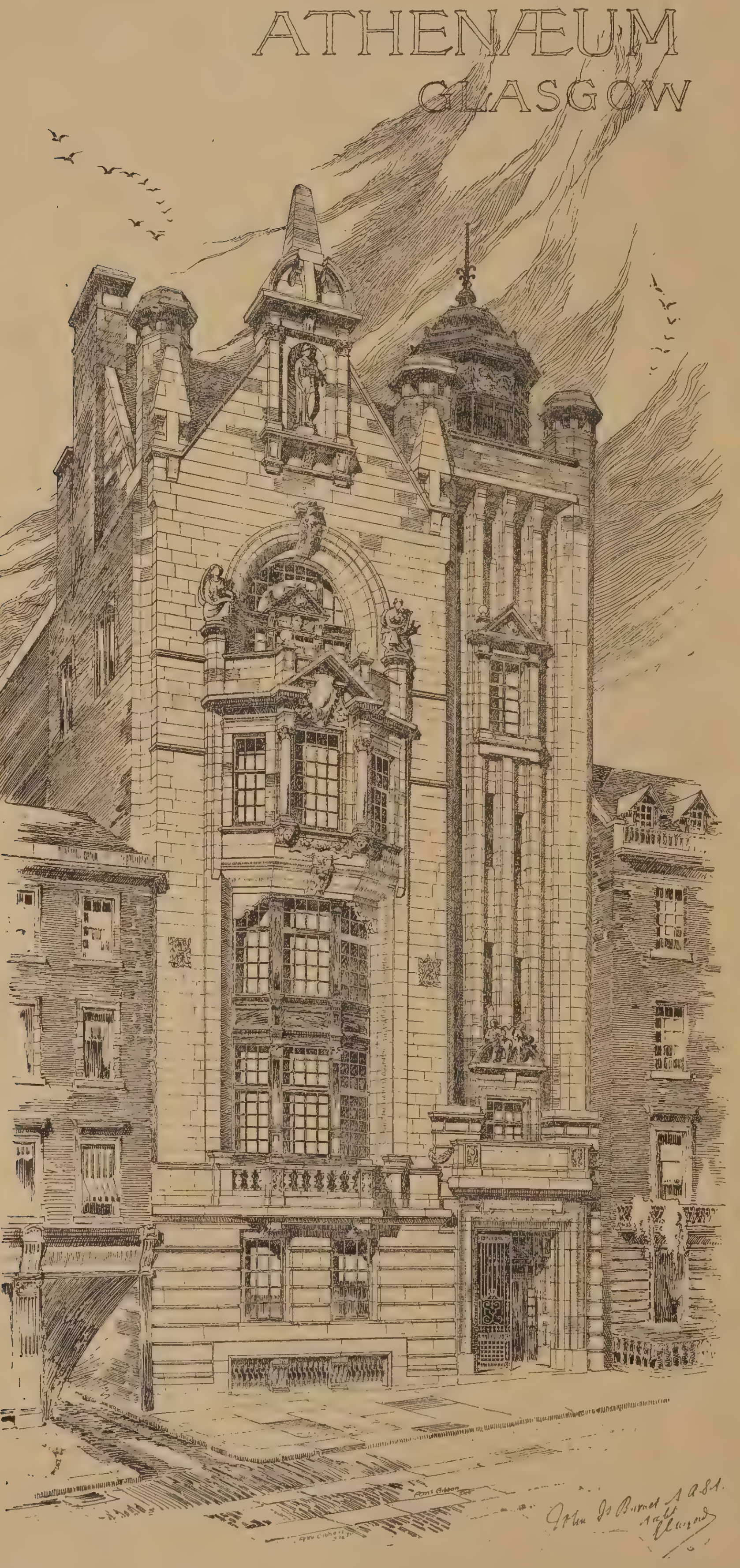
From the Classic feeling engendered by his training in France Mr. Burnet has never got free, though of course he is not now bound by its traditional forms. All his work has that solid, calm and direct-bearing feeling, and not that counterpoise of thrust-against-thrust, ever active, Gothic feeling. Classic in fact is his treatment of traditional Gothic forms, as in the Barony Church and in the Gardner and McLaren memorial churches at Brechin and Larbert, here illustrated. The former, the largest church in Glasgow, opposite the Cathedral, was the first work he did in the Gothic style. But in our opinion it is unsatisfactory, though full of interest, for it has no particular order in its arrangement, the roofs massing awkwardly—the result of an only partially-solved problem; moreover, it shows too much straining after effect with features of constructive significance, the essential quality in Classic which has been generally condemned. It is obvious that this method of "classicising," as it were, is often the only one open to the architect endeavouring to secure a good effect; for instance, when new conditions are concerned which are still in an elementary experimental state, when the refining action of tradition and fuller knowledge is out of the question, the senses can only be satisfied by graphic design. In illustration of this we may refer to the operating theatres at the Glasgow Western Infirmary, illustrated on page 145. Here the interior is absolutely logical, and therefore absolutely right. But on the exterior there are unmatured conditions like outside sunblinds and a roof constructed partly of glass, and features not absolutely essential to the building have been introduced to obtain proportion. The interior shows Mr. Burnet's strong point—the meeting of new conditions. Here his engineering training stands him in good stead: most of the fittings in this operating theatre, one of the first of its kind, were designed by him, and some are now, we believe, manufactured by firms who make a speciality of such articles. Another instance of the same quality is afforded by the novel glass verandah to "Carronvale," Glasgow, illustrated on pages 142 and 143.

In domestic work Mr. Burnet becomes more homelike; but his Classic detail again shows itself. In connection with domestic work we may refer to the treatment of the Gardner Memorial Church, Brechin. From the plan on page 146 and the photographs in our centre plates it will be seen how neatly the humbler and homelier requirements have been united to the essentially monumental character of the church, all suggestion of violent contrast being avoided. This peculiar type of plan, with single aisle and attached hall and rooms, has been adopted by Mr. Burnet in other Scotch churches, whose particular requirements necessitate such accommodation. Mr. Burnet has built a good many churches; and besides those here illustrated we may mention Arbroath and Rutherglen parish churches, and the very pleasing little village Established churches at Corrie and Shisken, in the island of Arran.

Mr. Burnet's work both gains and suffers by the artists working under him upon the details of his buildings, but on the whole he has been very successful in such matters as decorative plasterwork, of which he uses a great deal in his interiors. This is doubtless due to his domination of the design, the same applying to carving in wood and stone, but he cannot always get his subordinate workers to take equal pains with their work. He often designs forms which, from his engineering training, he knows can be constructed, but the engineers he engages to work out the stresses and exact sizes (he is a busy man, and cannot always find time to do this himself) often object on the ground that laborious calculations are involved, and they therefore wish to use the admittedly imperfect stock patterns. Another instance of detriment arising through assistants is shown in the crouching figures supporting the pediments and very low bas-reliefs on the wall under them, in the Glasgow Savings Bank. The designs were modelled by Mr. George Frampton

A.R.A., but they are weak and out of scale, this doubtless arising from the work not having been modelled and carved on the spot by the designer.

A fair share of honours has been accorded to Mr. Burnet. He is an Associate of the Royal Scottish Academy, a Fellow of the Royal Society of Edinburgh, and a Fellow of the Society of Antiquaries of Scotland. He was elected an Associate of the Royal Institute of British Architects in 1881 and a Fellow in 1897. Much as these honours are to be esteemed, their value is greatly enhanced when it is known that they were not obtained in that self-seeking and self-advertising manner unfortunately so common to artistic degrees.



SAND-BURIED CITIES.

Dr. Stein's Discoveries.

On p. 29 of our issue for August 28th last we published a brief account of Dr. Stein's discoveries in Chinese Turkestan. Some further particulars are now available.

Dr. Stein has said that a full investigation of the sculpture, fresco painting, objects of industrial art, and seals, &c., which were dug out of the temples and dwelling-houses of sand-buried sites will help us to resuscitate the civilisation of a region which has played an important part in history as the link between ancient China, India and the classical West. Now, for the first time, have been brought to light some aspects of the everyday life, the home industries and arts of the inhabitants of the villages and settlements of Chinese Turkestan which were abandoned in the early centuries after the beginning of the Christian era, and have since been buried under moving sand dunes. As showing the extent to which the desert has advanced, it may be mentioned that some of the settlements which have been excavated are situated quite 100 miles beyond the edge of the present cultivated area. The great lifeless desert is naturally regarded with much superstition by the people who live in the scanty settlements along the desert edge, and the difficulty of carrying sufficient supplies and water has luckily kept the native "treasure seekers" from visiting and exploiting the more distant and also more ancient ruined sites which have now been systematically explored for the first time under the auspices of the Indian Government.

No doubt can be entertained that the inhabitants of these places were in possession of a culture mainly derived from India, and that they were Buddhists. Dr. Stein's excavations go to prove that their culture was highly advanced, and that the art influences of Greece and Rome were felt even at that great distance from the centres of classical culture. Possibly,

The Most Striking Excavations

made by Dr. Stein were at a site in the heart of the desert north of Niya, where one settlement was exposed, covering with its scattered dwellings and shrines an area of about six miles by four. Until digging began all that was visible were weird-looking rows of bleached timber pieces projecting in various places like the framework of a wrecked ship from between the sand dunes. Round most of the sand-buried houses were brought to light carefully-planned little gardens with avenue of trees, fenced lanes, orchards, and so forth. It was truly astonishing on clearing away the sand to find under the shrivelled hedges heaps of dried leaves just as they had fallen in ages gone by. The gardens were much the same in character as those still to be found in Turkestan to-day The trees were mostly poplars and peach, mulberry and apricot trees. There is no evidence that these places were abandoned owing to any sudden catastrophe, but their gradual desertion was evidently due to the impossibility of continued irrigation, causing an advance of the sand.

Colossal Statues.

While articles of real value were therefore removed by their possessors Dr. Stein found in the dwelling-places many household implements of small value, such as pitchforks, mouse-traps, boots, chairs, shoemakers' lasts, &c. In the ruined temples he found a sort of unintentional exhibition of the fabrics of these remote ages—for in front of some of the idols were heaps of torn shreds of elaborately-worked silks and other fabrics which had been deposited as votive offerings. Many colossal statues in stucco were unearthed from the monasteries and temples. One of the latter contained in its cloisters over 100 statues, all more than life-size. While as many as possible of these were cleared for the purpose of taking photographs, only a few could be rescued, as, when the protecting sand was removed, the great stuccoes threatened to collapse owing to their inner wooden-work having rotted away. However, interesting portions of them were successfully brought away. Dr. Stein is now resuming his work as inspector of schools in the districts along the North-Western frontier.

THE ROYAL BUILDING TRADES' SCHOOL AT STUTTGART.

THE BEST OF ITS KIND IN GERMANY.

Dr. Rose, British Consul in Stuttgart, has prepared an elaborate report which has just been published by the Foreign Office on the technical, agricultural, commercial and art schools of Würtemburg. Of these the Royal Building Trades' School is the most important institution for secondary technical education in Germany. This was evidently recognised by the authorities of the South Kensington Museum, who, after having inspected the school, invited its participation at the Health Exhibition held in London in 1884. About seventy years ago there were no cheap facilities for the further education of skilled building workmen except the costly method of taking lessons from private teachers, foremen or architects. This disadvantage was also keenly experienced by those who wished to devote themselves solely to technical professions or to become subaltern technical State officials, and who were consequently compelled to limit their studies or to visit technical schools in France or Austria-Hungary.

A Short History of the School.

For these reasons the Stuttgart Trades' School was founded in 1832. In 1840 the school was raised to the level of a polytechnic, but as in course of time it became evident that—owing to the peculiar conditions then prevailing—the curricula for primary and secondary technical education could not exist together in one institution, a new Building Trades' School was founded in 1845. For a period of twenty years (until 1864) the school was only opened in the winter months, as the majority of the pupils were engaged in practical building work during the summer months. During this time the school had made such rapid progress and proved itself of such great importance that in 1865 summer classes were opened, the whole school was placed under the immediate supervision of the Ministry of Education with the designation "Royal Building Trades' School," and a special building was erected at a cost of £30,000. In 1900 two new wings were added to the original building at a cost of £12,000. The special aim of the school is the partial theoretical and thorough practical training of technical engineers, architects, surveyors, &c.

The general technical instruction afforded by the school is assisted and supplemented by the following :—

1. Excursions to works, factories, buildings and various places for the purposes of inspecting practical work, which excursions last two hours, half a day, or two to eight days (the expenses for travelling being defrayed by the school). 2. Competition in the upper classes for prizes given for the best building designs ; public exhibition of competitors' work. 3. Annual public exhibition of all work done by pupils during the year. 4. Permanent exhibition of the best work done by the pupils of the school. 5. School library valued at £5,000. 6. Collections for instruction in architecture, mathematics, construction, mechanical and electrical engineering, chemistry, physics, surveying, freehand drawing, painting in water colours and oil, models, &c., valued at £3,000.

Fees and Costs of Living.

The number of pupils during the winter term was 823 ; during the summer term only 679. The lowest age was 14½, the highest 34½, the average age 20 years. The large number of pupils (259) between 20 and 25 is a very significant fact and worthy of attention. As it may be safely assumed that a very large percentage of these pupils support themselves, their attendance shows what great value they attach to their further education. The fees are upon an extremely moderate scale, and amount to about £2 per term, or £4 per annum : they are partially or wholly dispensed with in the case of talented or industrious pupils who can produce officially-attested papers certifying to their indigent circumstances. For the year 1899 no fewer than 206 out of a total of 1,502 were thus relieved, the amount remitted being £294. There are also a number of small scholarships, of which his Majesty King William II. contributes 20 and the Freemasons' Lodge 3 ; they are worth about £5 per annum. The great majority of the pupils live in extremely moderate circumstances ; the following estimate, which is the result of a number of careful enquiries, will give an approximate idea of their annual expenditure :—

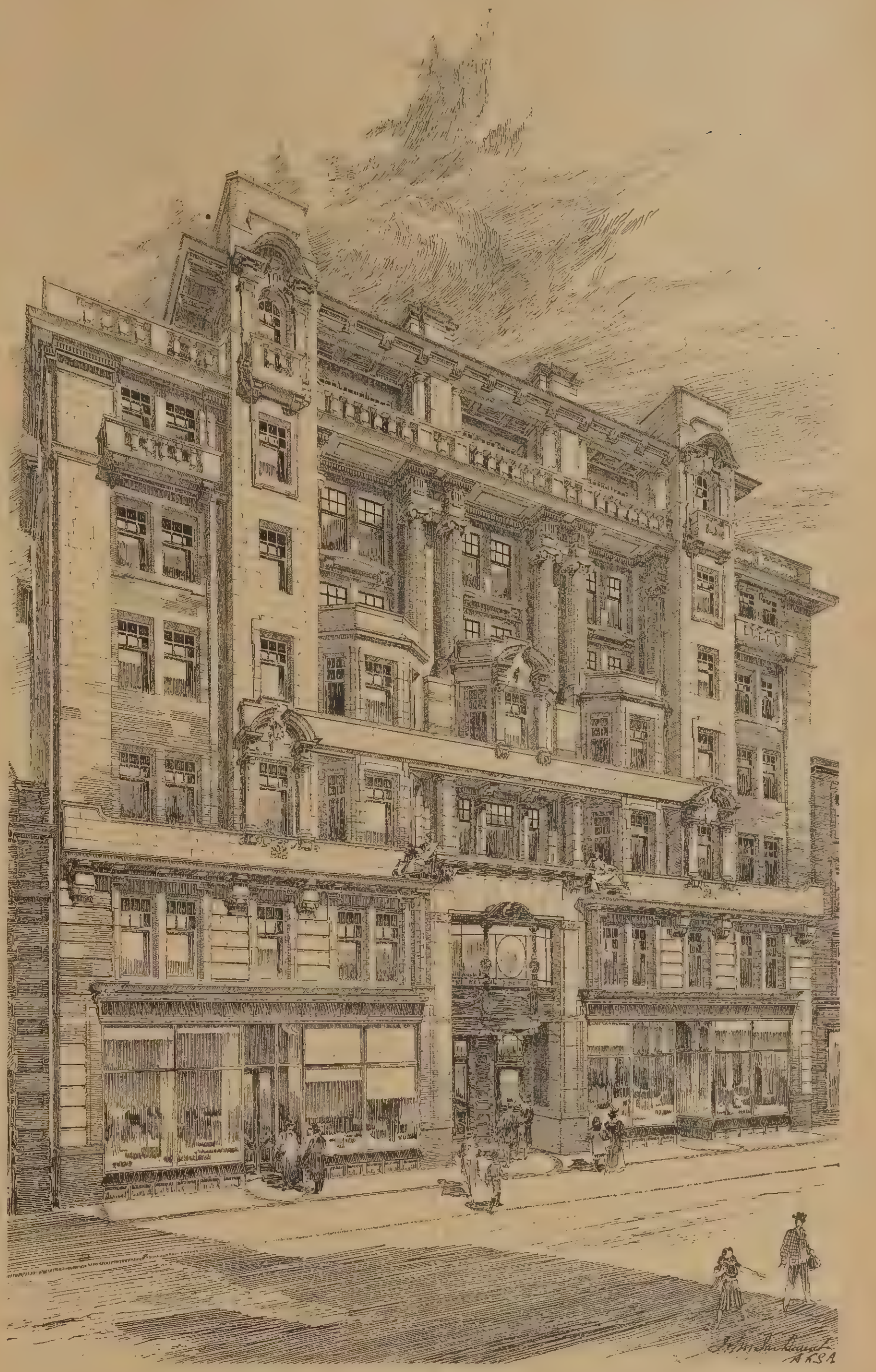
	£	s.	d.
Fees for two terms	4	10	0
Drawing materials, books, &c.	3	10	0
Combined bed and sitting room and board (breakfast, dinner, supper) for two terms	27	10	0
Coals, light and service	3	10	0
Miscellaneous	11	0	0
Total	£50	0	0

During the summer holidays, about three months, they either reside with their parents or relations or earn salaries by practical building, engineering or surveying work, or as draughtsmen. Pupils of the upper classes add to their incomes by giving lessons in mathematics and technical subjects to backward pupils of the lower classes. At the end of each term the best pupils of each class receive prizes worth from 15s. to £1 15s., the second best receive diplomas and the third best honourable mentions. After passing through the full courses, the final examinations for the following diplomas are held ; 1, State diploma for building and architecture ; 2, school diploma for building and architecture ; 3, diploma for hydraulic engineering ; 4, school diploma for mechanical engineering ; 5, State diploma for surveying ; 6, State diploma for surveying and agricultural engineering.

The financial status of the school for 1899 was—

Total expenditure	£10,721
Income from fees	2,781
Deficit covered by State	£7,940

Of all the German schools for secondary education which are known to the author from personal inspection and experience, the Stuttgart Building Trades' School undoubtedly occupies the first rank.



WATERLOO CHAMBERS, 13-23, WATERLOO STREET, GLASGOW.

"CARRONVALE," GLASGOW. JOHN J. BURNET, ARCHITECT.

CHINESE SLATES.

"AT the risk of imitating Artemus Ward, I must commence my account of Chinese slates by stating that there are none," says Mr. C. E. Darwent in a recent issue of the "Slate Trade Gazette." Hence, the Chinese, in giving their reasons for not using slates, may imitate the French priest who said he had twenty reasons for not ringing his church bell when the king passed through his village. His first reason was: "We have no bell."

Failing slates, the Chinese early took to roofing their houses with tiles. These are used universally, except in the poorer class of houses, which are thatched with straw or reeds, or, in the case of the huts of the huge beggar population, with anything that comes handy. The tiles on Chinese houses seem to have all the vices capable of being possessed by tiles. They are invariably black and of very coarse gritty clay. This shows itself in the surface texture, which is rough and sometimes even covered with sharp points, so that the finger might easily be slightly torn as it is passed over. Their capacity for absorbing moisture is enormous. Those of good quality cost £1 a thousand; those of poor quality 12s. a thousand. Each tile is held in its place by the weight of the one above it. It can easily be seen that to enable the tiles to keep their place at all they must overlap one another very considerably. They do so, in fact, to such an extent that each tile overlaps quite three-quarters of the one below it.

When Shanghai was first founded Chinese tiles had to be employed for foreign houses; but the advent of galvanised roofing is becoming universal for such houses.

Another consequence of the loose character of Chinese slates is that the roofs are in a chronic state of disrepair.

"I have not seen any tiles shaped like the English red pantiles. They are all simply concave, and are laid one on the other with the concave side uppermost. They are laid in lines, with a gutter between each line. The bottom tile of each row is slightly raised by a closed end, upon which appear designs (beautifully chased) of flowers or gods and goddesses, and these give a pretty finish to the roof. As to the laying of tiles, a Chinese contractor tells me that a workman will lay about half a faung a day, a faung being 10 ft. sq. This means that he lays 200 tiles a day. Wages are low. A man earns 30 or 40 cents a day (10d. or 1s. 3d.), according to circumstances. . . . I may add that while my description of ordinary Chinese roofs is, I think, correct, I must in justice say that when all the lines of tiles are in order they look well, while the roofs of the temples are frequently very beautiful. On quite ordinary temples and guild-houses the ridge of the roof has the most attention lavished on it. The ridge of the guild-house of the Shansi bankers in Shanghai is made of exquisitely coloured porcelain. The Symbol of the Sun is in the centre, with a sacred dragon at each side. Such roofs, with their yellow, red and blue tiles, with their quaint dragons and monsters and their graceful upturned gables, are as fine as any in the world; while one of the great temples in Pekin, with its roof of delicious sky-blue tiles, is one of the sights of the world—that is, if the Allied troops during their civilising campaign in that city have not totally destroyed it and robbed the world of one of the choicest productions of human art."

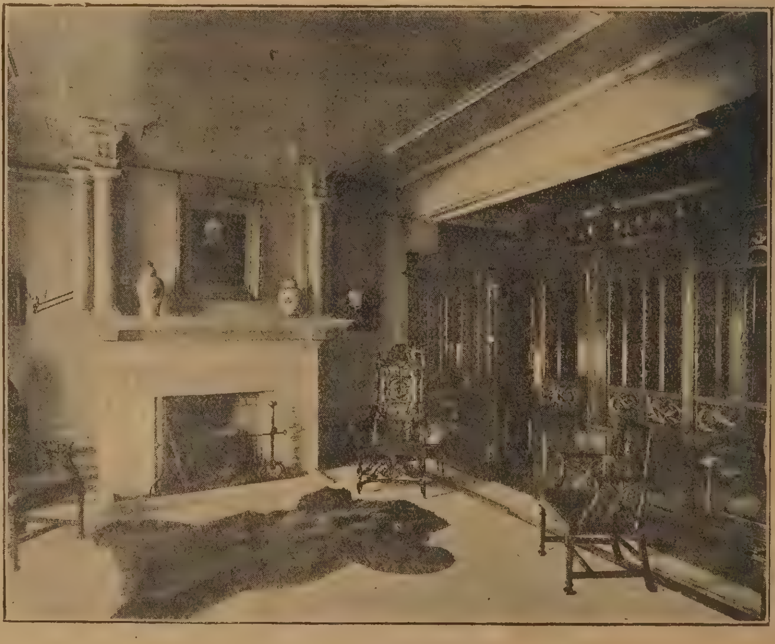
HOVE'S NEW PARISH CHURCH.

THE LATE MR. PEARSON'S WORK.

THE new Parish Church at Hove was reopened recently. It is built of Sussex sandstone from the quarries of Sir Weetman D. Pearson, Bart., M.P., of Paddockhurst, Worth, and to the designs of the late Mr. J. L. Pearson, R.A., the architect of Truro Cathedral. The work is being completed by Mr. F. L. Pearson. The seating accommodation is about 1,300, and the building is 160ft. long and nearly 80ft. broad. Unlike the greater part of the late Mr. Pearson's work, which is of the Early English style with small lancet windows, the general design is of a later period, corresponding with that of Westminster Abbey. The nave, which, including the transept, is 108ft. long and 35ft. wide, is divided into six bays. The two western bays which open respectively into the baptistery and the base of the tower are marked by lofty and richly-moulded arches springing from clustered piers attached to the north and south walls. The next four open into the north and south aisles, and are each of them 16ft. wide. The arcades consist of clustered piers 17ft. high, from which spring lofty pointed arches. Above these comes the clearstory, the parish church, as distinguished from the abbey church treatment, being kept up by the absence of the triforium. The clearstory, it may be added, is comparatively low, as in most English examples, and the windows being grouped two in each bay give the effect of a continuous arcade. The two eastern bays of the nave, which open respectively into the north and south transepts, are somewhat wider than the others, and the arches reach up to the level of the clearstory. The chancel arch is of a similar height and design to that which separates the western bays from the nave proper, but is more rich in detail, and beyond this the three bays of the chancel carry on the design of the nave, and from their width provide ample space for the choir stalls. One of the most remarkable features of the church, however, is the sanctuary, which is 23ft. in length. Although entered by an arch 58ft. high and 35ft. wide, the sanctuary is gradually narrowed in width to 27ft., and this increased height, combined with the reduced width, produces an extremely lofty effect which is in striking contrast to the broader treatment of the nave.

The east windows—three in number, with two lights each—are deeply recessed within pointed arches with clustered piers. There are also two lofty windows on either side of the chancel. The two aisles are respectively 21ft. and 16ft. wide internally, that on the south side of the nave being the wider of the two, and are lighted with lofty windows of three lights each, while the transept is lighted by a richly traceried window of five lights at the south end and an equally fine rose window at the other end. Leading out of the south transept a small chapel 46ft. by 21ft. provides accommodation for daily or occasional services. It is 32ft. in height. Like the baptistery at the west end of the church, it is vaulted throughout, and at the east end it terminates in a polygonal apse. The south wall of the two western bays of this chapel, it may be added, is completely filled in with six-light windows of very broad proportions, while those of the apse are of three lights each and are comparatively narrow and lofty.

To the north of the choir and sanctuary there is the organ loft and two vestries, that for the choir measuring 20ft. by 24ft., and over the vestries there is a church room with accommodation for about a hundred persons, for confirmation classes, missionary meetings and other similar gatherings. With reference to the organ loft it may be mentioned here that it is not proposed to remove the instrument from its present position until sufficient funds are forthcoming to enlarge it and make it worthy of the church, a work which will probably require some £2,000. The roof, except where it is vaulted, is of oak. In the nave it is divided into six bays by clustered wall shafts rising to a height of 36ft. From this height a series of cross-arches carry it up within 10ft. of its extreme height, where it terminates with a simple cornice. Externally in the south-east are two square turrets, with pinnacles and delicately-pierced tracery-work. At the south-west corner, where Eaton Road intersects the Drive, the tower and porch over the western door still require to be built. The cost up to the present has been about £41,000.



THE HALL, "CARRONVALE."

“CARRONVALE.”

RITES AND CEREMONIES CONNECTED WITH BUILDING.

ALL about us, in the present enlightened age, are customs and ceremonials connected with building that had their origin in the far back pagan days. They have been handed down from generation to generation like the unwritten rituals of a great secret order. When our public buildings are dedicated and public functionaries lay the corner-stone with silver trowels, we are simply following out the customs of our forefathers, with such modifications as the advance of civilisation has made necessary.

The study of the customs which have attended building in the various ages is a most attractive one. Mr. Lewis Dayton Burdick has recently published an extremely interesting book on “Foundation Rites, with Some Kindred Ceremonies: a Contribution to the Study of Reliefs, Customs and Legends connected with Buildings, Locations, Landmarks, &c.”

Human Foundation Sacrifices.

In Alaska, before the United States began to govern it without its consent, human foundation sacrifices were common. Among the Dyaks of Borneo, when a house was to be built a big hole was dug for the first post, which was suspended over it. A slave girl was dropped into the hole and crushed to death. The kings of Burmah buried four human beings alive at the corners of their capital, that their spirits might keep watch and ward off invasion. In the Japan of the seventeenth century, when a great wall was to be built a slave would voluntarily lie down in the trench and be crushed to death by great stones lowered upon him. Many times in Asia there have been popular panics caused by the fear that the old foundation customs were to be revived. As the Siberian railroad drew near the Chinese frontier, there was a great hullabaloo in Pekin. It was rumoured that the Russian Ambassador had asked her Humanity, the present Chinese Empress, for a couple of thousand children to bury under the rails. There was a similar scare in Calcutta when the Hoogly Bridge was building. The natives got it into their heads that after long refusal Mamma Ganges had agreed to be bridged on condition that each pier should rest on a layer of children's heads.

Ultimately animals and animal and vegetable products were offered instead of human beings. That Naples is built on an egg is known to all readers of the mediæval legends about the great enchanter, Virgil. A tallow candle was built into the wall of St Osyth's, Essex. A chicken, cock, lamb or something else takes the place of a slave or other human victim. There is a Russian folk-belief that the first person to enter a new house will die within the year unless an animal is killed and buried when the first stone is laid.

Curious Customs.

“In modern Greece,” Mr. J. G. Frazer tells us, “sometimes, instead of killing an animal, the builder entices a man to the foundation-stone, secretly measures his body or a part of it or his shadow, and buries the measure under the foundation-stone; or he lays the foundation-stone upon the man's shadow. It is believed that the man will die within the year. In the island of Lesbos it is deemed enough if the builder merely casts a stone at the shadow of a passer-by; the man whose shadow is thus struck will die, but the building will be solid. A Bulgarian mason measures the shadow of a man with a string, places the string in a box and then builds the box into the wall of the edifice. Within forty days thereafter the man whose shadow was measured will be dead and his soul will be in the box beside the string, but often it will come forth and appear in its former shape to persons who were born on a Saturday.” In these cases the shadow is the life, soul or strength, according to a common article of primitive faith no harder to believe, perhaps, than most other things are.

A Roumanian Folk-Tale.

But let us borrow a Roumanian folk-tale from Mr. Burdick. Radu the Black had promised Manoli and the other masons gold in piles and titles to burn if they would build him the fairest palace ever seen; but if it was not up to specifications, he swore that the bunglers should be walled-up in his monastery. Four days the masons worked, there being no union to prevent them. Four nights all that they had built tumbled down—toppled over, we may believe, by the walking delegates of the Devil. On the fourth Manoli had a dream of dread. A voice had sounded in his ear that every night would undo the toil of the day if the masons did not build, living, into the wall the first woman that should come upon them. Manoli told his dream to his fellow workmen. All took oath to obey the voice. The next morning Manoli, full of black presentiment, stood upon the scaffold and watched the country round about. His wife, Flora the Beautiful, was coming with his breakfast. He held her in his arms while the wall of death was rising around her. When she could be seen no more he could just hear her moaning faintly: “Manoli, Manoli, the wall is pressing on me and my life is dying out.” And now the palace stood solid. Soon it was finished, magnificent, a wonder of the world. The masons stood upon the scaffolding awaiting Radu and the glorious wage.

By the prince's command the props of the scaffolding were knocked away and the masons dashed to death. Manoli clutched a projecting carving and would have saved his life had he not heard just then from beneath the wall the feeble moaning voice: “Manoli, Manoli! the cold wall is pressing on me; my body is crushed; my life is dying out.” So down among the dead men let him lie; and serve him right.

There are some ceremonials still followed in building that it would be worth while to study closely. Such, for instance is the custom of fastening up the “roof-tree” when the framework of the roof is finally in place. We have heard it said that the symbolic meaning of this ceremonial is that the framework of the house is supposed to have made use of the trunk of the tree, and consequently the topmost crown of the tree itself is hoisted up to occupy its old place once more. If this was the origin of the custom, it was doubtless a rite of propitiation. In this prosaic age, however, the purpose of the ceremonial is evident. It is an invitation from the builders to the owner to recognise (by a donation of liquor or cigars) the progress that has been made. A particularly interesting feature of this ceremonial is the modification that has come about with changed conditions in building. The “roof-tree” is not confined to wooden houses, but it is changed into a flag for other buildings.

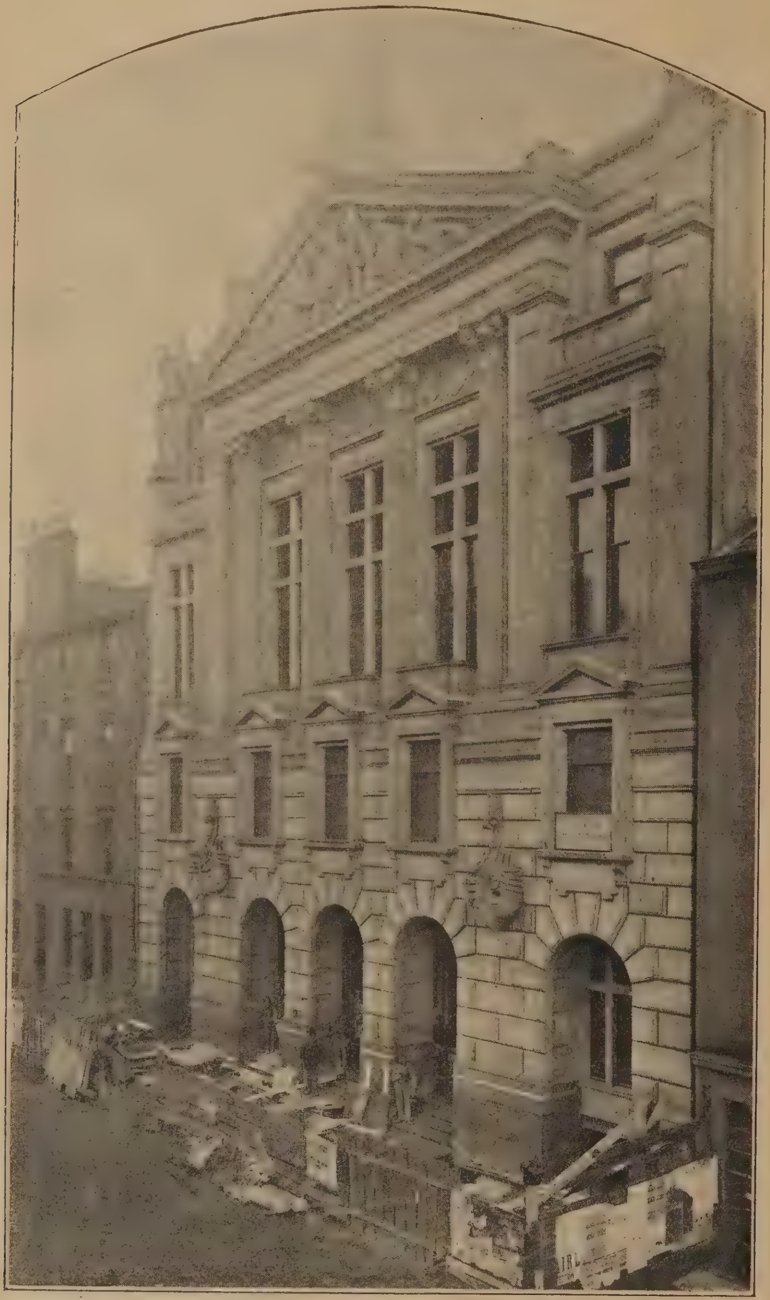
Workmen and Liquor.

In this connection it is interesting to note the important part that donations of liquor have played in building in the American colonies, especially in those which had a large proportion of Dutch settlers. It was long a standing complaint that the most onerous part of the expense in church-building was the enormous bill for “drinks” for the workmen. A detailed example is found in the bills for the erection of the first stone house in Albany, in 1656. This was a Government house or fort, and it cost about £700. When the old wooden fort on the site was torn down, a tun of strong beer was furnished to the workmen. When the first stone of the new edifice was laid, 33 quarts of brandy and 32 guilders' worth of other liquor

THE DINING-ROOM, ‘CARRONVALE.”

were called for by the workmen and duly served. So much as a start for the masons. The turn of the carpenters came when the cellar beams were laid. They were satisfied with two barrels of strong beer, three cases of brandy and 72 florins' worth of small beer. This satisfied them until the second tier of beams was laid, when they had two more cases of brandy and a barrel of beer. There was no chance for dry rot to attack these beams, for they had all been "wet" previous to laying. They were stacked up without the walls and were brought inside one by one by eight men, as they were wanted. For each beam carried these men were given half a barrel of beer, and there were thirty-three beams in all! All of the teamsters, wood-carriers, carpenters, stone-cutters and masons had a daily allowance of a gill of brandy and three pints of beer apiece at dinner, besides special treats. This did not satisfy them, however, and they "struck" for another daily pint of beer. When the roof-tree was set in place, the carpenters were satisfied with a half barrel of beer, surely a most modest demand. Under the name of "tiles beer" a half barrel went to the tile setters. A winding staircase was a feature of the fort, and when this was finished five guilders' worth of liquor gave the workmen the necessary winding gait to test it.

One-eighteenth of the cost of the building went down the throats of the workmen! Fortunately, the building customs have changed from those strenuous times, or only brewers would be able to build houses.



OFFICES OF THE CLYDE NAVIGATION TRUST, GLASGOW. JOHN J. BURNET, ARCHITECT.

BARROW ABATTOIR.

NEW public slaughter-houses are being erected by the Barrow County Council at the north-east end of Cavendish Street, and adjoining the electric light station and the refuse destructor, at an estimated cost of £18,000, from designs by Mr. W. H. Fox, the borough engineer, but only about two-thirds of the scheme is being carried out at present. The site of the present premises is a most convenient one, bounded on the north-west and north-east sides by the proposed cattle market, on the north-east side of which runs the Furness Railway main line. It has also the advantage of having two approaches, and is such that will be convenient for the butchers, convenient for rail, and convenient for the refuse destructors, where condemned diseased meat and refuse which cannot be profitably dealt with may be destroyed by fire. The slaughter-house and lairs will be at least 100ft. from any dwelling, and can be worked without nuisance to anyone. The area of the site is 7,490 sq. yds., a considerable portion of which is made ground. The buildings when completed will, exclusive of the superintendent's house, consist of five blocks, the first measuring 100ft. in length by 22ft. in width, comprising superintendent's office, fodder shed and store. The second block, measuring 158ft. by 44ft., consists of a slaughter hall, 115½ft. in length and 25ft. in width; cold stores with chill-room for seventy carcases; engine-room and stores on ground floor and refrigerating room over. The third block, measuring 158ft. in length by 29ft. in width, consists of lairage accommodation measuring 120ft. by 25ft. 3in., and space at the north-east end of the block for a tripery and gut-scraping house. The fourth block, measuring 78ft. in length by 33ft. in width, consists of a pig slaughter-house, a cooking-room and a boiling house. The fifth block, measuring 44ft. in length by 21ft. in width, comprises a block of sixteen piggeries. The exterior walls of the building are faced with bricks similar to Accrington plaster bricks, and the interior of the slaughter-houses and cooling-room are faced with glazed bricks. The floors of all the slaughter-houses, cooling-rooms, lairs and piggeries are of concrete, made so as to give a foothold, and the roofs are covered with Westmorland green slates and have louvre ventilators. The slaughter-house, cooling-room and chill-rooms are fitted with wrought-iron rails and runners, so that the carcases can be run where required with as little handling as possible. The cattle and sheep lairs are fitted with wrought-iron feeding-troughs and accessories of the most approved kind. A complete system of sewerage and drainage is provided, and also a complete system of electric lighting, and hot and cold water supply where required. Trees will be planted within and near all the boundary walls, which will add to the appearance of the premises and help to take away the gloomy associations belonging to such an establishment. Mr. Brown, builder, is the contractor; and the various apparata are fitted up by Messrs. J. Gordon Alison & Co., Ltd., of Birkenhead.

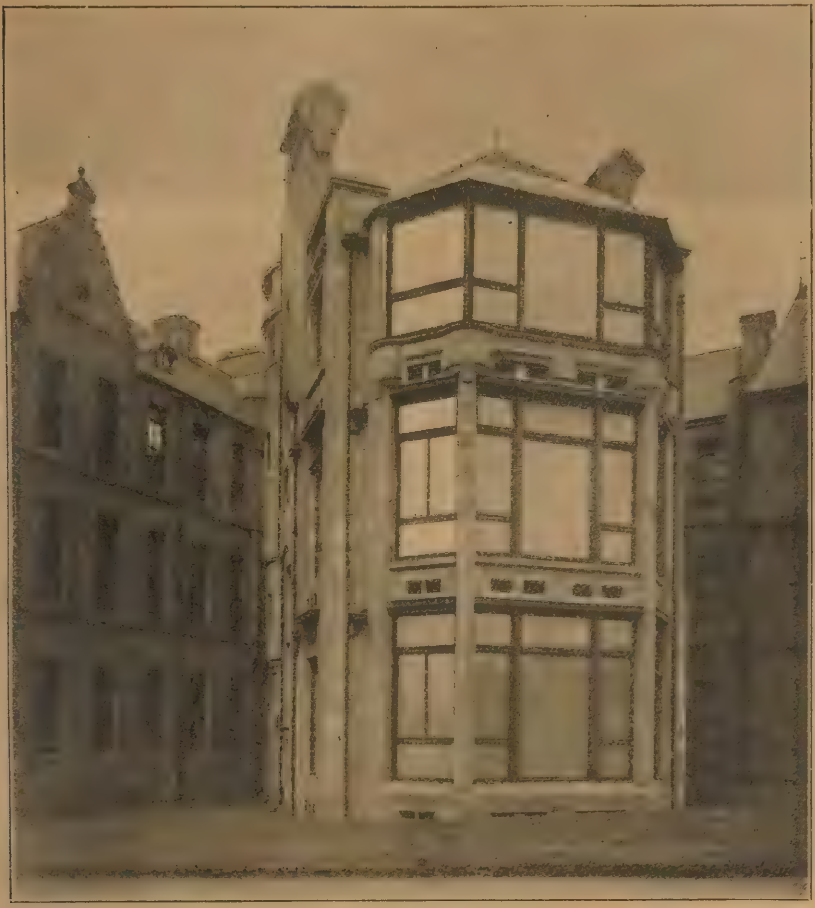
Surveying and Sanitary Notes.

A Motor Car for the Essex County Surveyor is to be purchased by the County Council for use in highway work at a cost of £300.

The Sanitary Inspectors' Association held its annual general meeting last Saturday night at Carpenters' Hall, London Wall, when the eighteenth annual report and balance-sheet were submitted and adopted. The report showed that very satisfactory progress had been made during the past session. A very large accession of ordinary members and associates had been obtained. Sir James Crichton-Browne was elected as an honorary member.

Brockwell Park.—The Brockwell Park Extension Committee have completed their work by the payment of (about) £66,800 for the 43 acres of beautifully wooded land adjoining Brockwell Park. The land was rescued from the builders' hands by this committee in August, 1899, and a provisional contract was secured by them for two years, terminating on September 29th last. It now passes from their hands to the jurisdiction of the London County Council, and thus becomes the property of the people for ever.

The Westminster Paving Contracts.—At a meeting of the Westminster Ratepayers' Committee held last week it was resolved that a deputation should wait on the Westminster City Council for the purpose of urging the members to rescind the irregular deal contract and award the same to the lowest tenderer who has complied with the specification; also to suspend the surveyor pending the result of an enquiry, and to call upon all members of the Works Committee to resign who have been in the habit of visiting and being entertained by a contractor. At a meeting of the Committee held on Friday last it was also recommended that the contract entered into by the Improved Wood Co. should be rescinded, and that the suitability of American red gum for street-paving should form the subject of special and expert enquiry, pending which any further paving operations with this wood should be stopped.



NEW OPERATING THEATRES, GLASGOW WESTERN INFIRMARY. JOHN J. BURNET, ARCHITECT.

A NEW TECHNICAL INSTITUTE.

THE new technical institute for the districts of Kirkdale and Walton was opened at Liverpool recently. The building is the second of that kind which has been completed by the Liverpool Corporation to meet the requirements of the outlying portions of the city. Two years ago an institute for providing instruction in technical subjects was opened in Picton Road, Wavertree, and has since done good work, the classes being well attended by residents in the eastern districts of the city. The building just opened will meet the wants of students in the populous north end of Liverpool, and will accommodate those who formerly attended the technical classes at Arnot Street and Longmoor Lane Board Schools. It is also intended to provide room for the Kirkdale students, who have in the past had small facilities for obtaining instruction in handicraft subjects within comparatively short distance of their homes. A third institute of a similar character is in contemplation for the southern division of the city, but the erection of this will not be undertaken for some time.

The Walton institute is situated at the corner of Carisbrooke Road and Harlech Street. It is built of red Ruabon bricks with stone courses. The main entrance is from Carisbrooke Road. On the ground floor are five class-rooms, one of them being specially set apart for classes in domestic subjects. This has a separate entrance, and is fitted for instruction in cookery, laundry work and dress cutting. There is adjoining, a class-room with seats on a raised gallery, and a special demonstration table for lectures in chemistry and other experimental sciences. On the left side of the main entrance are three class-rooms for instruction in commercial and general subjects, and teachers' room, porter's office and lavatory accommodation are also provided on the same floor. In the basement, in addition to a heating chamber is a room specially fitted up as a workshop for classes in woodwork, wood-carving and modelling, and another for building construction generally. There is a separate entrance to these rooms by means of a staircase in Harlech Street. On the upper floor is a room 32ft. 6in. by 25ft. 6in., arranged and equipped for mechanical drawing, for engineering subjects and for building construction; and another room, 50ft. by 24ft., specially lighted and furnished for instruction in art subjects. On the same floor is a large lecture hall and examination room, 52ft. by 34ft., capable of seating about 300 persons, and adjoining this is an ante- or extra class-room. The whole building is a modern treatment of English Renaissance. The materials employed are red pressed Ruabon bricks and Grinshill stone dressings. The roof is of blue Welsh slates. The floors in the lecture and class-rooms are of pitchpine and concrete fireproof construction, and the examination room on the top floor is finished with a dado 3ft. 6in. high of glazed tiles in two shades of green. The work has been carried out from plans prepared by Mr. Thomas Shelmerdine, city surveyor, the construction being superintended by Mr. Dawson, of the Corporation architectural department. The contractors were Messrs. S. Wearing & Son, of West Derby, and the cost of the building has been about £8,800.

Correspondence.

"The Magazine of Art."

To the Editor of THE BUILDERS' JOURNAL,
LONDON, N.W.

SIR,—Referring to Mr. Harry Hems's letter on page 125 of your last issue, I have Part I. of the "Magazine of Art" before me. On the top of the front cover is "Part I. May, 1878." A supplement, with special pagination, contains "Art Notes for May," and the pages of the "advertising" sheets are dated May, 1878. The price was 7d. The frontispiece is a reproduction of "The General's Head-quarters," from the picture by J. F. Pettie, R.A., for the Royal Academy Exhibition.—Yours truly,

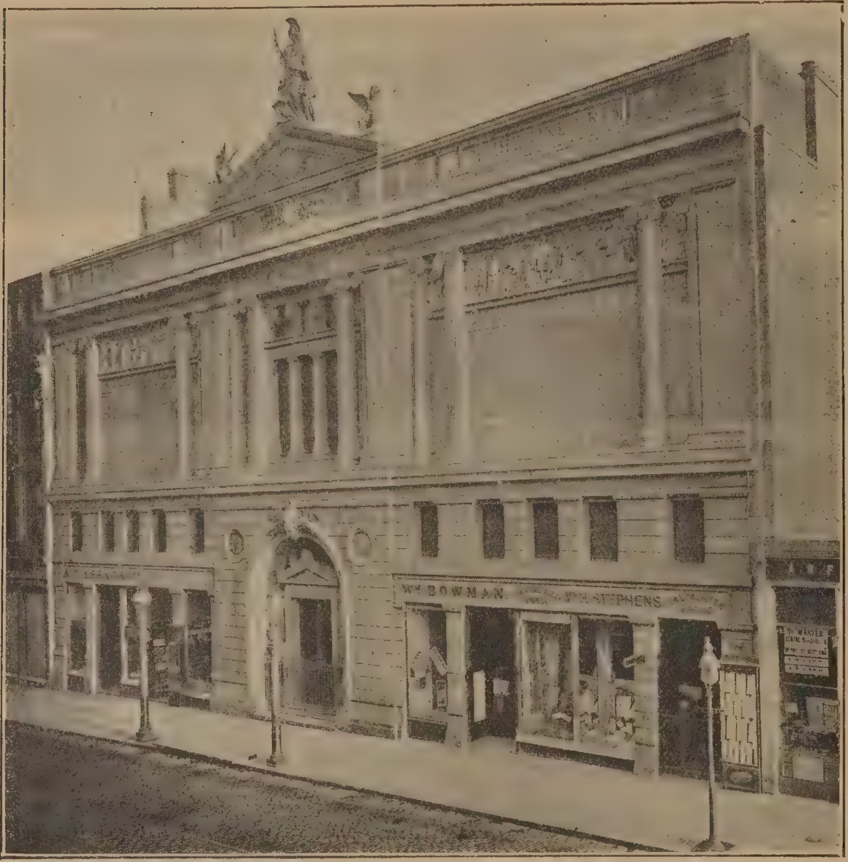
B. W. DEXTER.

ANOTHER SILCHESTER.

What Mr. Talfourd Ely has Found There.

THE main Roman road from Porchester, at the head of Portsmouth Harbour, to Chichester runs through Havant, in the east of Hampshire; and a mile or two south of Havant lies Hayling Island. It is now connected with the mainland by a bridge, but in early times it must have been quite cut off, except at very low tide. Formerly it was of much greater extent, not only on the west and east, where Langstone and Chichester harbours respectively have been excavated by the action of the sea, but also to the south, where the Church Rocks bear witness to the truth of the tradition that the original South Church stood on a spot now covered by the waves. With Roman settlements in Hampshire, Sussex and the Isle of Wight, it is not strange that tradition should have come down to us of the existence

INTERIOR OF ONE OF THE OPERATING THEATRES.



GALLERIES OF THE GLASGOW INSTITUTE OF FINE ARTS, SAUCHIEHALL STREET.
JOHN J. BURNET, ARCHITECT.

of Roman remains in Hayling Island, and fixed the site at a spot which the excavations of Mr. Talfourd Ely have shown to be correct. In the north part of the island, a little to the west of North Hayling Church, is the Towncil Field, part of a larger area at one time held in allotments, and here from time to time coins have been turned up by the plough. In this field there was a slight elevation, manifestly artificial, and when examined carefully it was easy to trace by the different colour of the crops the outline of the foundations below, just as at Silchester the *insulæ* or blocks may be detected by the same criterion of a less fertile yield over the stonework. In 1897 Mr. Talfourd Ely commenced operations which have been carried on year by year since that time. Though he has been rewarded by no very valuable "finds" in the way of curiosities or museum specimens, he has had the good fortune to establish the fact that here stood

A Very Early Roman Building

of large size, the foundations of the outer walls being 150ft. by 170ft. And the method in which the excavation has been carried out is probably unique, for all the work has been done by himself. He had not only to plan the excavations but to carry them out. The popular idea, as exemplified in a plan prepared from an inspection of the lighter lines in the crops, was that of a building with a semicircular apse at one end. This, however, the excavations have not quite confirmed.

As the work progressed it became evident that here was more than a villa in the sense of a country residence. The outer walls seem to have enclosed not only the house but out-buildings, such as sheds or barns. The living-rooms were indicated by the presence of painted wallplaster, roof tiles, and light and dark *tesseræ*, though nothing was found that could in any way compare with the fine pavements unearthed at Brading, Silchester and many other places. This is probably due to the early date of the work, which is approximately fixed at the end of the first century of our era. A bronze coin of Domitian, with the date A.D. 95, was found during the work. Year by year the excavations have gone on and thrown more light on the character of the building, which will no doubt be described fully by Mr. Talfourd Ely when the work is finished. Last year a chamber was uncovered the floor of which was of small flints covered with trampled clay, set with *tesseræ* so thickly that more than eighty were picked out from the space of a square yard. The building must have been warmed by hypocausts, for remains of the furnace and flue tiles were found. A very fine specimen of Romano-British work in the shape of a circular bronze brooch was discovered. The groundwork is blue enamel still brilliant, with a central raised circle, surrounded by smaller ones, each with a depressed setting for a stone. This year a corridor 30ft. long, another about 40ft., and a room 15ft. by 20ft. have been uncovered, so that it is safe to conclude that the house itself was of considerable size. A very interesting discovery consisted of a number of fragments of terra-cotta, with deep flutings. Mr. Ely believes that the pieces are to be accounted for by the building having been burned down. The terra-cotta probably served as a dado or wall-lining, as many of the pieces have a projection at the back apparently for fastening to the wall. The other remains include nails, a Roman key, a razor blade or knife, black Romano-British pottery and a few pieces of red Samian ware. No human remains were met with; the bones belonged chiefly to domestic animals, and there was more than the usual quantity of boars' tusks, some of large size.

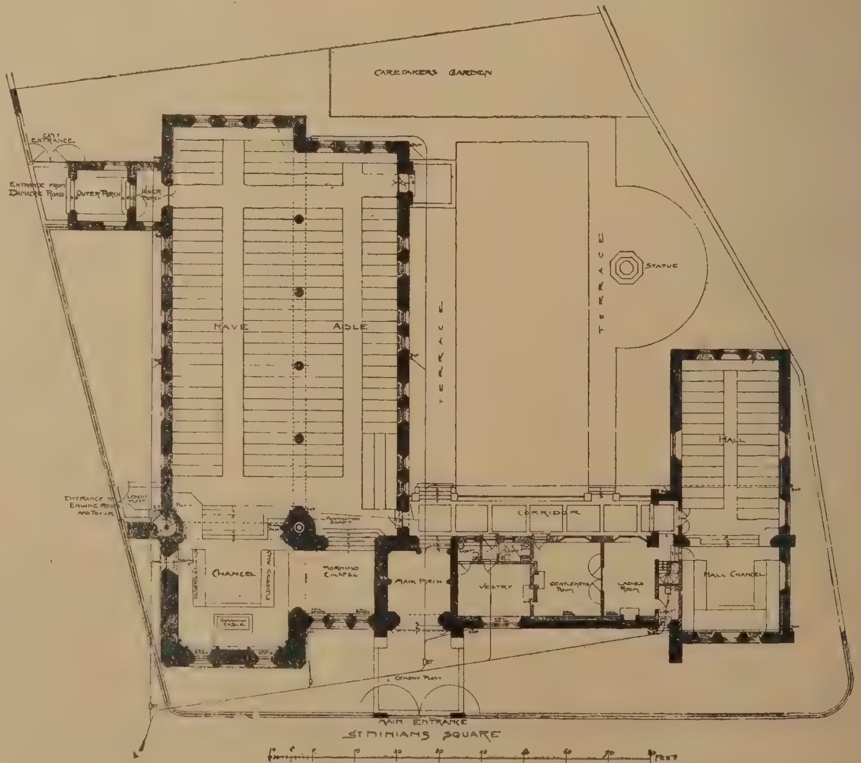
New Patents.

None of the patents open to opposition until November 11th, a list of which was published in our last issue, are of sufficient novelty or interest to warrant them being noted in this column according to our usual practice.

The following specifications were published on Saturday last, and are open to opposition until November 18th. The name in italics is that of the communicator of the invention. A summary of the more important of them will be given next week.

1900.—10,538, McLACHLAN, coal-house, ash-pit and other doors. 10,649, MADEN, ventilating sewers. 16,177, McLARTY, apparatus for dressing stone. 17,624, HOLLICK & HOLLICK, cranes, winches, &c. 17,835, PAGE, construction of shop and other windows to prevent condensation of moisture. 18,247, CAMPBELL, kitchen ranges and fireplaces. 18,486, MACLAURIN & MOFFAT, heating apartments. 19,093, ADAMS, roller blinds. 19,397, STODART, window bolt. 20,097, BLENKIN & WARD, door-knobs. 20,197, LACHMAN, metal troughs for electric mains. 20,308, ROTHERY, metal caps used in glazing. 20,333, RYDING, apparatus for domestic fireplaces. 21,405, PRINGLE, apparatus for disinfecting buildings.

1901.—1,704, COLLINS, self-propelled street-sweepers. 5,143, CLARK, road-sweeping and collecting machines. 8,333, ELBERS, process of treating molten blast-furnace slag. 9,960,



PLAN OF GARDNER MEMORIAL CHURCH BRECHIN.

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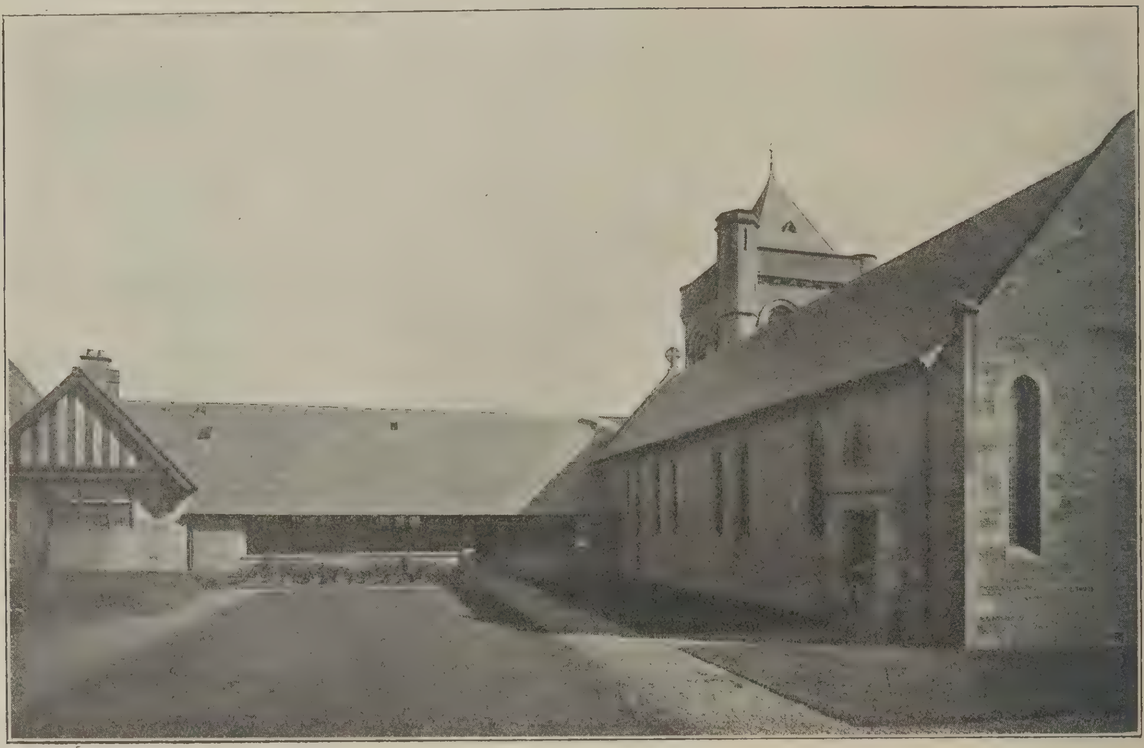
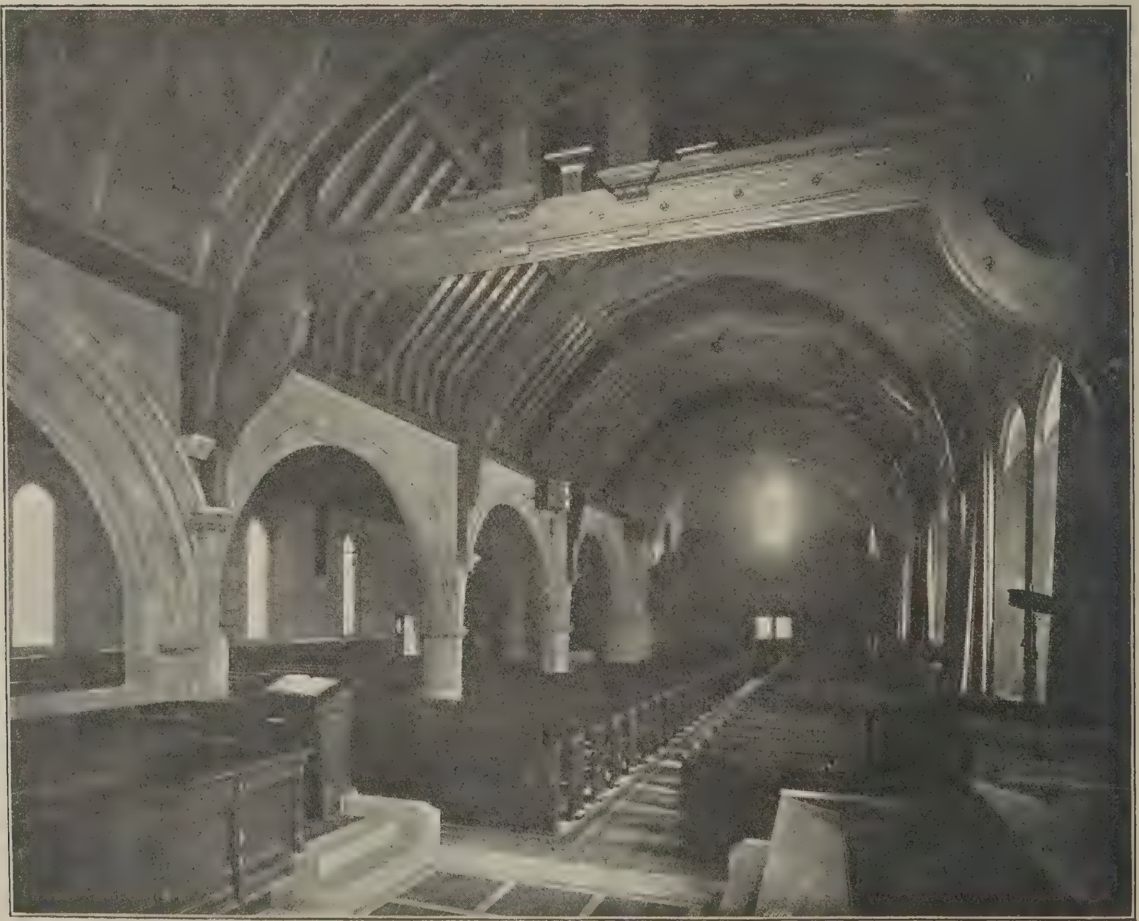
Wednesday, October 9th, 1901.





GARDNER MEMORIAL CHURCH, BRECHIN.

JOHN J. BURNET, A.R.S.A., Architect.

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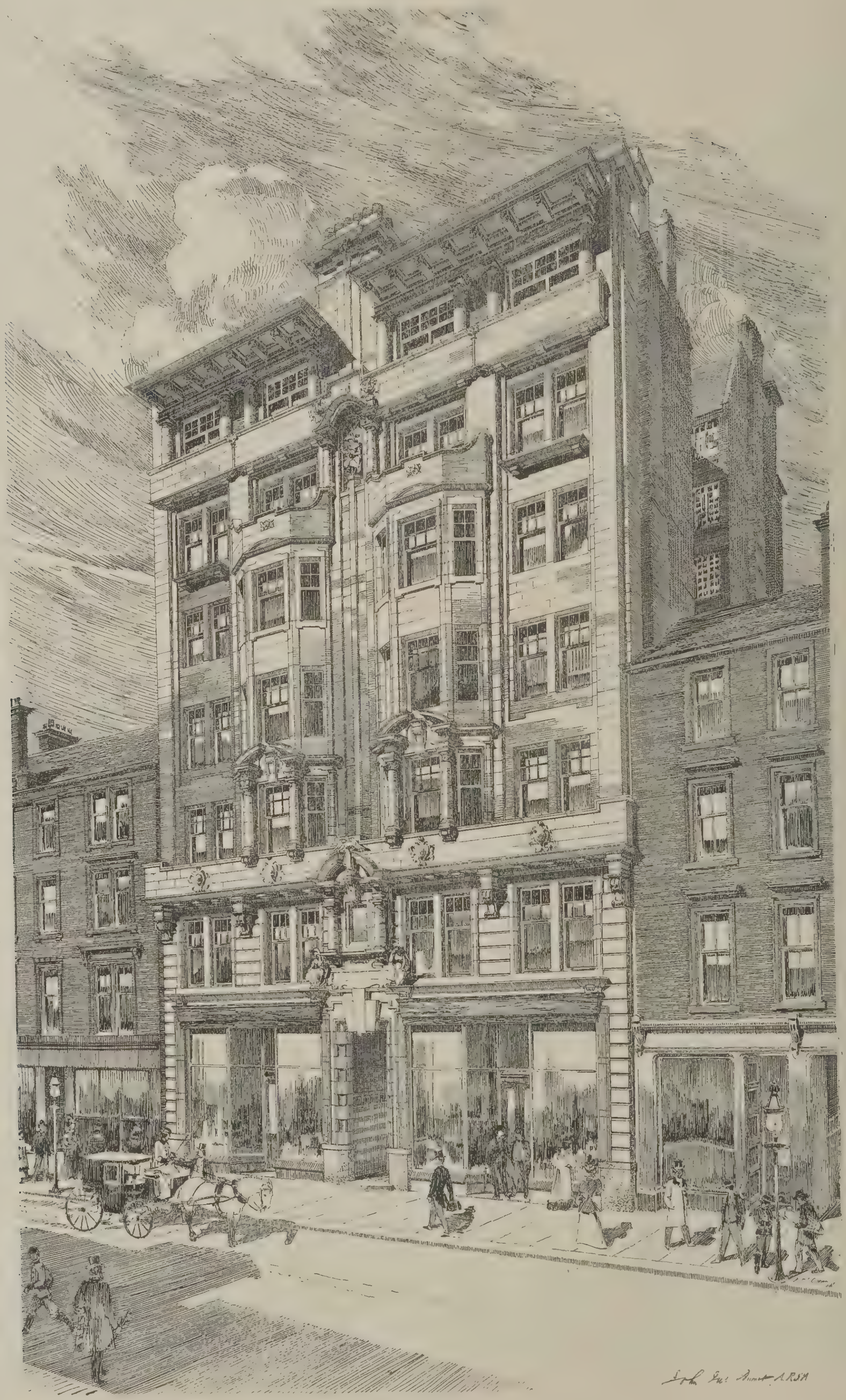

ATLANTIC CHAMBERS, 43–47, HOPE STREET, GLASGOW.

John J. Burnet, A.R.S.A., Architect.

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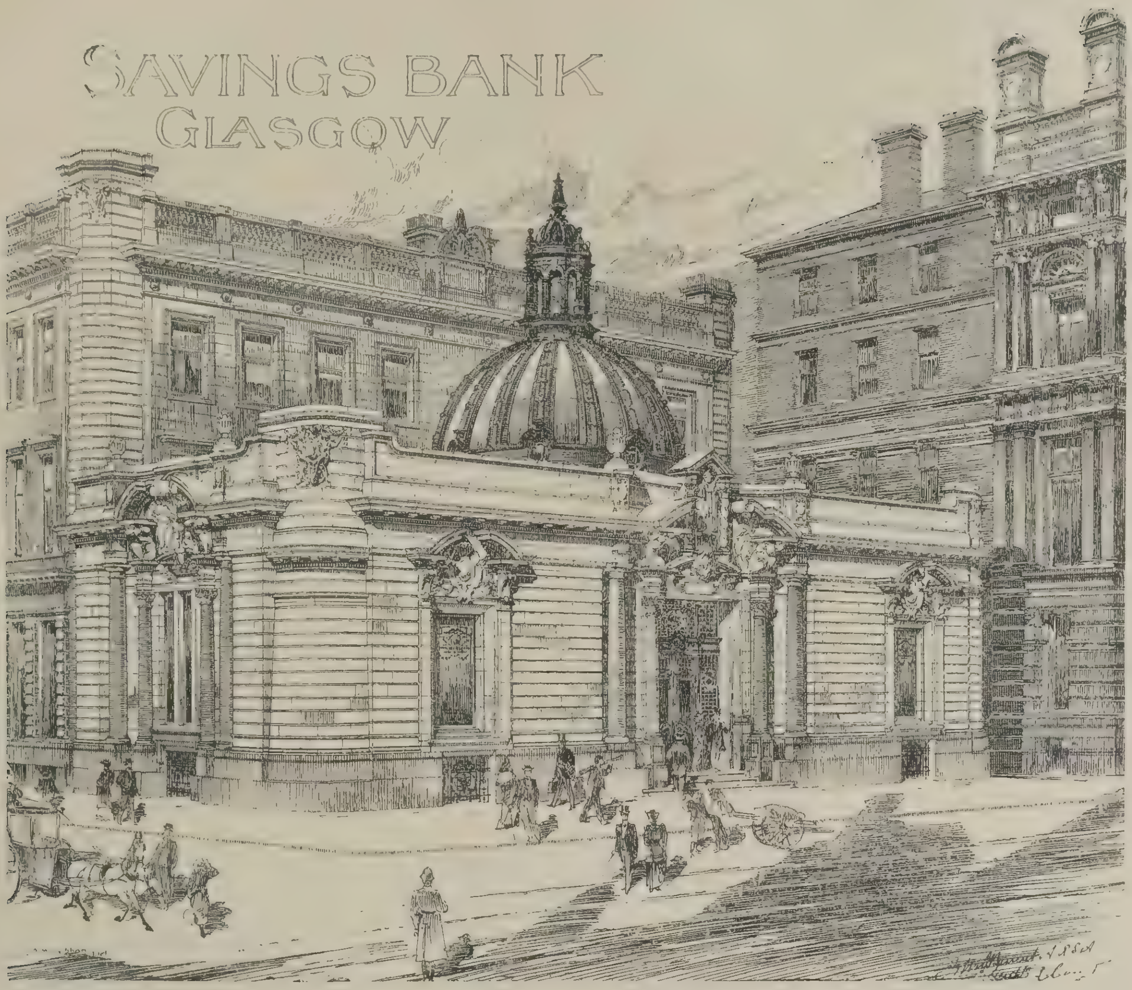

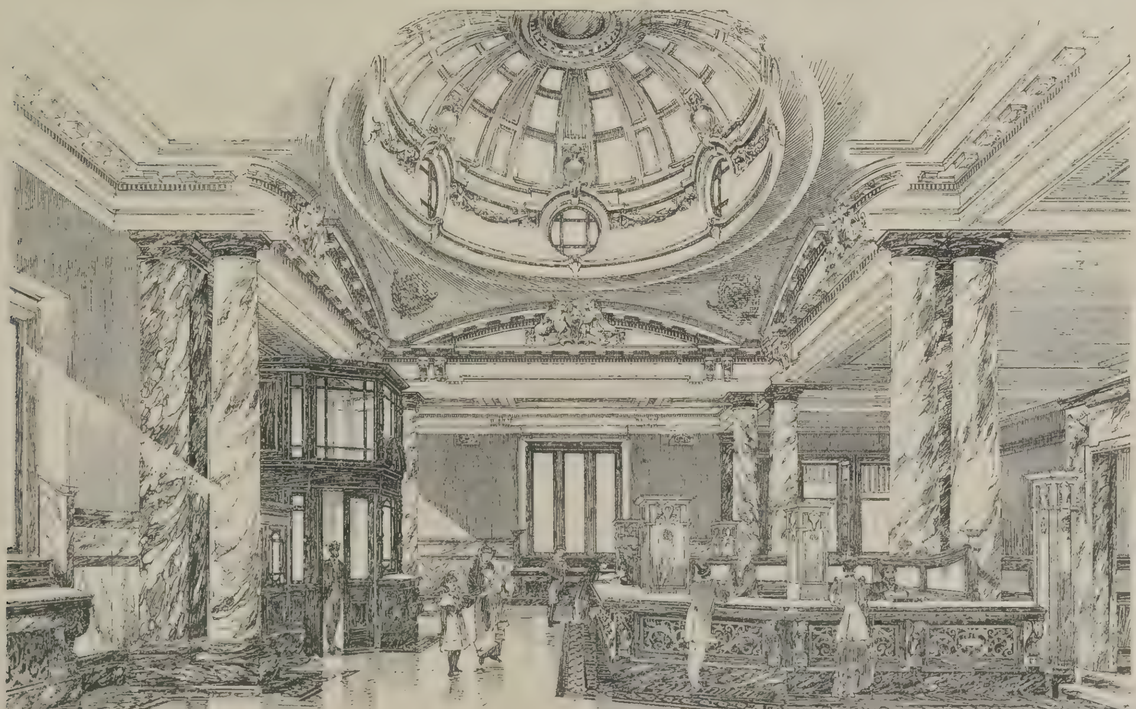

John J. Burnet, A.R.S.A., Architect.

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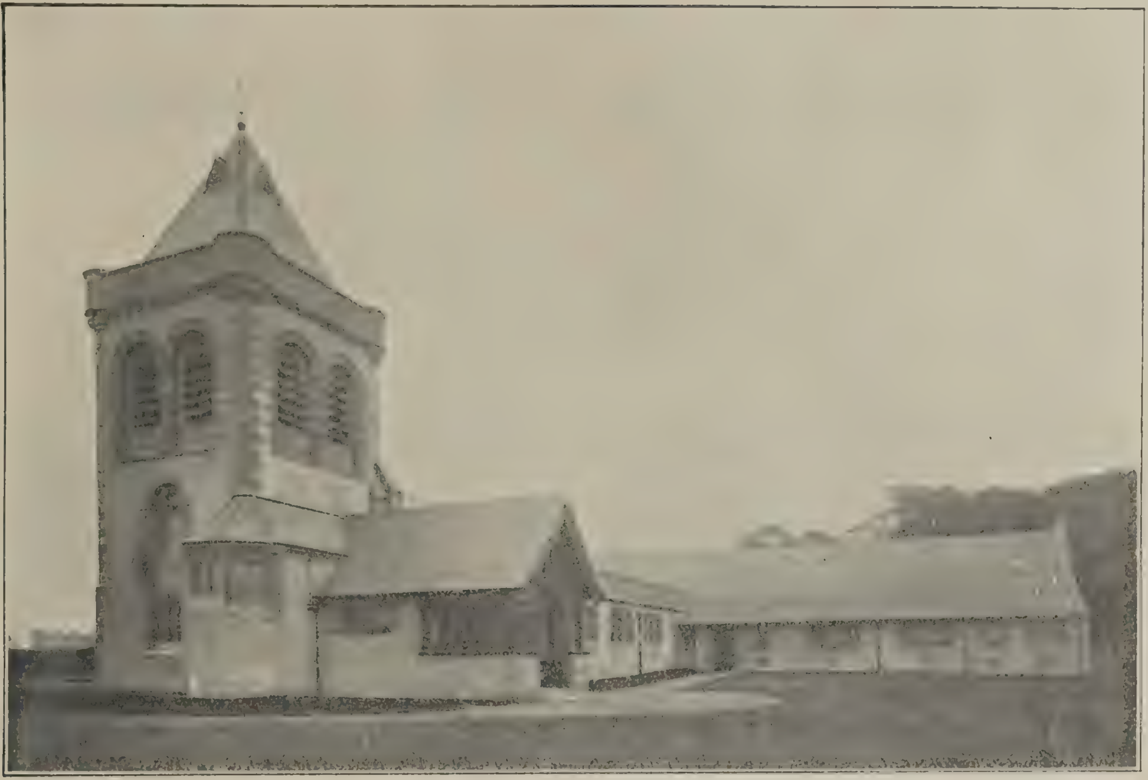

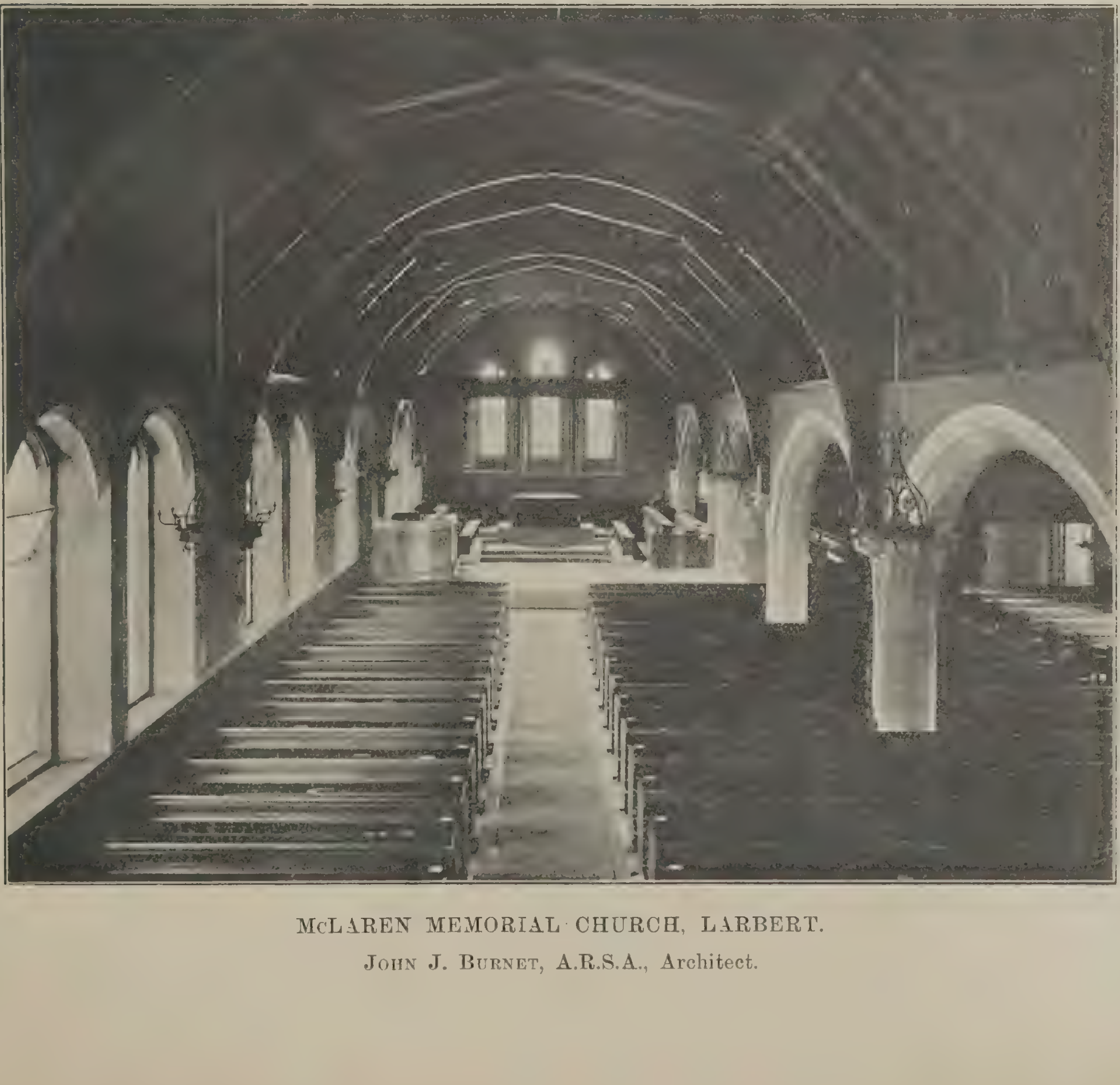

McLAREN MEMORIAL CHURCH, LARBERT.

John J. Burnet, A.R.S.A., Architect.

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ALLISON (*Pullman*), ventilating device. 9,967, JOHNS, window sashes. 10,602, TASSAIN, glazing conservatories, &c. 11,196, WALLACE, arrangement for slewing the derricks of steam winches. 15,215, HESEMANN, means for opening and closing skylights. 16,320, BEDINGTON & BEDINGTON, sash balances for windows.

Engineering Notes.

St. Annes Pier.—The directors of the St. Annes Land Co. have decided to obtain powers to widen St. Annes-on-the-Sea Pier and erect a concert pavilion at a cost of £25,000. The engineers are Messrs. Garlick & Sykes, of Preston. The pavilion, which will be of Oriental design, is to seat 800 persons.

Electric Lighting at Battersea.—The Battersea Borough Council's Central Electric Generating Station was opened recently. The installation, which is intended to supply about 45,000 lamps of eight-candle power as well as 240 arc lamps erected in the streets, is arranged on the continuous-current three-wire system, with a constant pressure of 460 volts across the outer conductor of the mains. The system has been laid down by the Council's own workmen at a cost of £152,000. Professor Kennedy was the engineer of the system.

Vauxhall Bridge Delay.—The extraordinary delay which has arisen in connection with the construction of the new Vauxhall Bridge will be the subject of an enquiry by the County Council on an early date. The contractors for the sub-structure, Messrs. Pettick Brothers, of Plymouth, have occupied over that portion of the work as long as was taken to build the old bridge in 1816. Their contract expired last March, but there is as yet no sign of an early completion of the work. The contractor's explanation of the delay is that unforeseen difficulties have arisen in the execution of the work, but, on the other hand, the officials of the County Council say that these difficulties are no greater than might have been expected in the construction of a bridge in a tidal river like the Thames.

The Lighting of the Thames Embankment contains some novel features. On the recommendation of the County Council's engineers, the long-burning open type of the Gilbert arc lamp will be used. These lamps take 6ft. of carbon, which greatly lessens the cost of labour for re-carboning; and the inconvenience of using ladders in crowded thoroughfares is avoided by the use of arrangements for lowering the lamps to the ground. The lighting of the parapets was started last February, the existing gas standards being converted for the purpose. As these standards were so close together, lamps taking about half the usual amount of electrical energy, and giving a proportionately small light, were used. Considerable difficulties attach to the use of these small-current lamps, and this is the first time they have been successfully used for extensive public lighting.

The Manchester Tramways were recently taken over by the corporations of Manchester and Salford from the Carriage Co. that worked them. This has now resulted in vexatious delay and disorganisation, which renders ineffective the reduction in fares, and other added advantages do not compensate. As long as the company had the traffic of both of the municipal areas they worked the whole as one concern, and the division between them was ignored, just as Metropolitan omnibus passengers are enabled to ignore the bounds of Westminster from the rest of London. Now that the Salford and Manchester areas are worked separately by their respective local authorities the remarkable fact is disclosed that after some years of negotiation between them on this very question—negotiation from the time, indeed, when they resolved to take over the working of the lines—they cannot come to terms with each other for the continuance of any service across the boundary. Since municipal management began in May and June last the experience of passengers has been that wherever the company's tramway service was disjointed the breach of communications is seriously enlarged, while wherever the service across the boundary was continuous the continuity is destroyed.

Views & Reviews.

A Good Book Badly Illustrated.

This is a most readable addition to the "Highways and Byways" series issued by Messrs. Macmillan. In his tour through the Lake Country the author describes what he sees in a facile manner, with touches of humour, historical notes, art criticism, or literary anecdotes as occasion offers. We are, however, surprised that, though he is at great pains not to miss anything connected with Southey, Gray, Wordsworth and De Quincey, he has not a word to say of John Ruskin, with whom Coniston at least is inseparably associated. The Lake Country is mostly dependent on its own intrinsic beauty, for its story is merely that of a pastoral people who were neither makers of history nor builders of castles and abbeys; and those several poets and writers who added so greatly to English literature were drawn there by the natural beauties of the country and were not indigenous to it. The Lake District includes but few large buildings of importance to the architect, though the archæologist will not lack for objects to interest him. But both will find this book of value to them, whether they have visited the lakes or not. Mr. Joseph Pennell has made a large number of sketches to illustrate the letterpress, but they reflect little to his credit; in fact, we are astonished that an artist of such capabilities and technique should supply drawings the majority of which give one no idea of the beautiful landscape and cannot be held up as models of draughtsmanship. They would be highly interesting in a sketch-book; but this is not a sketch-book. Certainly there are a few exceptions, but the rest are hasty and incomplete "notes"—most disappointing.

McLAREN MEMORIAL CHURCH, LARBERT. JOHN J. BURNET, ARCHITECT.

While referring to the Lake District it is opportune to note that the purchase price of the Brandelhow Estate on the western shore of Derwentwater has been raised, and that, after paying the necessary expenses entailed in carrying out the scheme, there will remain some money in hand to go to a permanent maintenance fund.

"Highways and Byways in the Lake District." By A. G. Bradley. With illustrations by Joseph Pennell. London: Macmillan & Co., Ltd; price 6s.

Arts and Crafts.

In these two lectures, delivered at Liverpool in 1888 before the National Association for the Advancement of Art, we are on the old road. William Morris was a theorist in art, as in socialism, but he was not impracticable like most of his followers, and his common-sense saved him from the superficialities we are at present being nauseated with. His theories (no one would have been more ready than himself to acknowledge that they were mere approximations to the truth or partial truths) have been seized upon with avidity and applied in season and out to pretty well everything by persons who over-estimate their strength and consequently waste their energies, often doing more harm than good. However, after all, they are superior to the opportunists. Morris was never tired of pressing his definition of art as man's pleasure in work, and his philosophy seems almost summed up in this. In the lectures under review he merely reiterated the doctrines of Ruskin, and argued that architecture and art should be put upon a true co-operative basis. His opinions with regard to the part the guilds played in mediæval architecture and its evolution are now being worked out by several of his colleagues and others, but such antiquarian researches, though interesting, are of doubtful utility in the foundation of a true philosophy of art. That the true theory can be built up on *a priori* grounds is, however, apparent, and archæology is waiting for this before it can receive its full interpretation. The book is printed in the Golden type designed by Morris for the Kelmscott Press.

"Art and its Producers, and the Arts and Crafts of To-Day: Two Addresses delivered before the National Association for the Advancement of Art." By William Morris. Price 2s. 6d. nett. London: Longmans, Green & Co., 39, Paternoster Row, E.C.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*Of course I know that it is better to build a cathedral than to make a boot; but I think it is better to actually make a boot, than only to dream about building a cathedral.*"—("Concerning Isabel Carnaby.")

Raby Castle Chapel. THE chapel at Raby Castle has recently been renovated, and during the work of clearing the walls of a layer of plaster some interesting discoveries were made by Messrs. J. P. Pritchett & Sons, architects, of Darlington. The chapel is the oldest portion of the Castle, dating from the middle of the fourteenth century; and at the west end was disclosed a six-light window of that period, about 14ft. wide and 8ft. high, walled up with solid masonry about 2ft. thick. The sill, bead, jambs, mullions and tracery are in almost perfect preservation. This, in the opinion of the architects, was an open screen, or unglazed window, opening from the end of the chapel into the "Barons' Hall," the side of which abuts on it, and was, no doubt, for the purpose of enabling persons in the hall, or general living-room, to participate in the services which, prior to the Reformation, took place at the altar opposite. On the south side was found a fourteenth-century doorway and a beautiful three-light window of later—probably fifteenth-century—work. This, too, seems to have been an unglazed window or screen between the chapel and a small chamber or pew, such as is frequently met with in the chapels of royal and baronial castles. An ancient two-light window has been opened out in a wall 10ft. 9in. thick. Another discovery is the ancient fourteenth-century "aumbry" or closet for the Sacramental vessels, which has been found nearly perfect in the east wall, to the south of the altar.

A Parisian Commemorative Inscription. MR. SIMONNEAU, the manager of works for the city of Paris, has recently discovered, near the artesian well, the first stone of the old abattoirs at Greville, and the steel plate commemorating their foundation, The inscription engraved on this plate is enough to put the adulators of Augustus Cæsar to the blush: "Under the reign of Napoleon the Great, Emperor of the French, King of Italy, Protector of the Confederation of the Rhine, Mediator of the Swiss Federation, always victorious; on the 2nd April 1810 memorable year! in which the Spaniards were defeated, day still more memorable on which by his union with Maria Louisa of Austria, Napoleon magnanimous Emperor (may God grant him a numerous posterity) re-united two nations long separate, consolidated the peace of the Continent, and laid the foundation of the fondest hopes of France. The first stone of this grand edifice, one of the five abattoirs of the City of Paris was laid by His Excellency Jean-Pierre de Montalivet, Count of the Empire, Grand Cross of the Legion of Honour, Minister of the Interior." In addition to this plate the foundation stone contained an allegorical medal of the marriage of Napoleon and Maria Louisa and a series of coins of the period, which have been transferred to the City Museum.

A Suggestion for Architectural Prizes. THE Prix de Rome in architecture of the French School of Fine Arts for this year has been awarded to M. Hulot, already well-known as a winner of prizes, medals and mentions. The second prize was awarded to M. Prévot. The subject assigned for the competition shows very well the skill of the directors of the school in interesting their pupils and inciting them to think for themselves. It will be remembered that the city of Paris and the French Government are now discussing, not to say disputing over, the disposition to be made of the fortifications surrounding the city. Ever since the brave though unsuccessful defence of these same fortifications against the Germans in 1871, it has been evident to military men that a fortified enclosure around a great city is, as a factor in the defence of the city, worse than useless. It was, therefore, determined a year or two ago to demolish the fortifications of Paris and to sell the vacant territory obtained in this way to the city at a price to be agreed upon. Unfortunately, it proved difficult to agree upon the price; and although the fortifications in the neighbourhood of the Porte Maillot and the Porte Dauphine, where the land obtained by their removal would be most valuable, have already been demolished, it does not appear that an agreement for transferring the territory to the city has actually been concluded. However, a wide strip of vacant land in the most fashionable and beautiful section of Paris has been made available for building, and it is not surprising that the brains of the local architects teem with projects for utilising it. The professors of the School of Fine Arts, interested like the rest in the matter, proposed therefore in the programme for the Prix de Rome competition that this strip should be made the site of a building or group of buildings which, by another concession to the popular fancy of the moment, should be destined to accommodate an American Academy in Paris, or perhaps we should say the American Academy in Paris, steps having already been taken to establish such an institution, on a scale, however, for the present much more modest than that of the Prix de Rome scheme.

The Wolverhampton Exhibition. THE Executive Committee appointed to arrange for the holding of the Arts and Industrial Exhibition at Wolverhampton next year have already accepted a tender for the Industrial Hall, and they have now accepted the tender of Mr. J. Herbert, builder, of Hartley Street, Wolverhampton, to erect the Machinery Hall at a cost of £7,297. It is expected that the hall will be completed in four months' time. It will be an imposing structure, and will stand adjacent to the Industrial Hall. It will be 350ft. in length and 130ft. in width, with a three-span roof. The chief decorative features will face the Industrial Hall. The frontage to the park will be treated in a style similar to that of the Industrial Hall, and inside the visitor will have an unbroken view except for two rows of columns carrying the roof of the centre bay. Arrangements are being made for the erection of a concert hall and other attractive structures, including a Japanese pavilion, as it is hoped that the Japanese Government will in this building be officially represented by a number of products of that country. The time for receiving applications for space was October 1st, and many leading firms are making application for space for a large display. More particularly may be mentioned the manufacturers of electrical machinery and appliances (amongst them being the Electric Construction Co., Ltd.), and builders of the most recent high-speed engines adapted for such purposes. Arrangements have also been made to show in actual work examples of the German water-tube boiler (Durr) and also the new Cahall water-tube boiler, now largely used in the United States. In the industrial section it appears that an exhibit will be made by the leading firms of interior decoration and furnishing which will be of exceptional interest. The inaugural ceremony in connection with the building operations will be performed by the Earl of Dartmouth on October 17th.

Alterations at St. Giles', Cripplegate. UPON the union of the benefice of St. Bartholomew, Moor Lane, with that of St. Giles', Cripplegate, it was decided to remove to the latter edifice a number of historic appointments which formed an interesting feature of the first-named church. Though itself a comparatively modern edifice, St. Bartholomew's, Moor Lane, contained not a few valuable relics which were recovered from the church of St. Bartholomew-by-the-Exchange at the time of the Great Fire. The original church was rebuilt near the Bank in 1438, destroyed by the historic conflagration, and replaced by Wren. Then, the historian informs us, "the materials of the old church were sold by auction in 1841 for £483 15s., the south wall of a chapel being eserved to be built into the Sun Fire Office, as was also some of the carved masonry, the old pulpit, the organ and other woodwork, which were preserved in a copy of the old tower and church erected in 1849-50 by Professor C. R. Cockerell, R.A., in Moor Lane." When it was decided that the Moor Lane edifice should at last disappear for ever, the authorities of Cripplegate obtained a faculty authorising the removal of the several interesting relics to St. Giles'. For some months past the work of re-erection has been in progress by Messrs. W. H. Lascelles & Co., 121, Bunhill Row, under the direction of Mr. F. W. Jackson, the clerk of works, and now it is all but complete. The result of the improvement has been to provide an ante-chapel at St. Giles' to the north of the chancel. Here the reredos from Moor Lane has been placed. It is composed of carved wood, attributed to Gibbons, and contains two coloured panels representing Moses and Aaron. The Communion table is of elegantly figured marble. On the wall to the north of the reredos has been fixed another beautiful specimen of carving, in which are apertures for two panels. The reading desk has also been removed. The tiled floor of this former chancel has been relaid, and the partition rails have been made from the choir stalls in use at St. Bartholomew's. The difficult task of removal has been carefully carried out, and the result is to add in no small degree to the beauty of Cripplegate's parish church. When "the four shoppes" disappear, the Great Fire commemoration window is also to be fitted up at St. Giles'. Apropos of the improvements, it is interesting to note that the same firm have had in hand the re-erection of a licensed house adjoining the church. In order to establish a sound foundation it was necessary to burrow some 27ft. below the chancel of St. Giles'.

A Manchester Architect. WE regret to announce the death of Mr. John Littlewood, member of the well-known firm of Messrs. Mangnall and Littlewoods, architects, of Manchester. Death took place rather suddenly at his residence, Lansdowne Villas, Old Trafford. A native of Holmfirth, Yorkshire, Mr. Littlewood served his articles with Messrs. Travis & Mangnall, architects, of Manchester, and he was engaged with that firm during the erection of many important buildings, including Watts's warehouse in Portland Street. On the death of Mr. Mangnall, early in the 'seventies, Mr. John Littlewood joined his brother, Mr. William H. Littlewood, in carrying on the business, retaining the style of Messrs. Mangnall & Littlewoods from that period. Under that title Messrs. Mangnall and Littlewoods have carried out many designs for public buildings, and they can show an interesting record of prizes won in keen competition. For example, the two brothers obtained the prize of £500 for their design for the Manchester Corporation Gasworks in Bradford Road. That was so far back as 1878; but coming to a more recent period, they designed the Campfield Markets, the Salford Corporation baths at Broughton and Regent Road, the new schools and homes for the Chorlton Union Board of Guardians at Withington, and other public institutions. During the past few years Messrs. Mangnall & Littlewoods have been conspicuous in the erection of piers and concert pavilions at various health resorts. Morecambe Pier and Concert Pavilion and the Empress Ballroom at Blackpool are instances of their art and skill in this direction. Mr. Littlewood was a member of the Manchester Society of Architects, and was elected an Associate of the R.I.B.A. in 1882 and a Fellow in 1888.

A Leeds Competition. NEW premises for the Leeds Public Dispensary is to be erected on Hartley Hill. Designs for the new building were sent in last week by seven competing local architects, namely, Messrs. Bedford & Kitson, Mr. W. S. Braithwaite, Messrs. Chorley, Connon & Chorley, Messrs. W. A. Hobson & Co., Messrs. Perkin & Bulmer, Messrs. Smith & Tweedale and Mr. W. H. Thorp. The site has a frontage to North Street as well as to Hartley Hill, but the latter thoroughfare will display the chief architectural features. Each competitor has sent in a full set of plans, and a cursory examination suggests that complete accommodation has been provided for waiting patients, for the medical and surgical staff, for administration and for the resident officers. When the final selection will be made is not yet known.

CATHEDRAL COURT, GLASGOW.

SOME HOUSING EXPERIMENTS IN GLASGOW.

THE housing problem has long confronted the citizens of Glasgow, but the conscience of the city was specially stirred about twelve or thirteen years ago, mainly by the powerful appeals of Dr. James B. Russell, at that time the medical officer of health for the city. A commission of clergymen and laymen then investigated the actual conditions of slum life, one result of which was the formation in 1890 of the Glasgow Workmen's Dwellings Co., Ltd., with a capital of more than £40,000. The company (whose registered office is at 137, West George Street, Glasgow) set themselves to afford some "object lessons"—first, in building simple and sound houses; secondly, in improving the structure and the management of dilapidated slums: the whole to be let at rents within the reach of the labouring classes.

Ten years have since come and gone, and it seems fitting that the results should now be reviewed.

The general results may be thus summarised: The capital subscribed has been fully invested; two sites, one in the north and the other in the east of the city, have been bought and six large blocks of new buildings erected on them; twenty-six blocks (or tenements) of neglected and dilapidated houses—hot-beds of disease and crime—have been purchased, twenty-one of which have been radically and thoroughly renovated and converted into decent homes, while work has been commenced upon the five remaining blocks recently acquired. The company now owns 677 houses, and when the work on hand is completed it will have an annual rent-roll of nearly £4,800 and will shelter more than 2,900 persons. It has for years paid a steady dividend of 4 per cent. to its shareholders, besides accumulating £1,950 of reserves and undivided profits.

As the first experiment it was resolved to erect very small houses, mostly of two rooms, and ascertain the result of letting them at a scale of rental approximately the same as that of the houses in the overcrowded slums surrounding the site selected. Suitable ground in Rottenrow was purchased in 1891 at a cost of £1 per sq. yd., but, through the delay in obtaining official approval of the plans in respect of open balconies and other novel details of construction, it was not until June, 1893, that the blocks were completed, at a cost of £7,756.

This property has been named Cathedral Court, and the illustration on this page shows the class of houses which have replaced the filthy hovels of Rottenrow. The ground covered by buildings is 538 sq. yds., or 50 per cent. of the whole.

Each of the two blocks is built of brick, rough-cast or "harled" on the outside, with hollow walls and concrete lintels, sills, stair-steps, &c.; there is also a flat roof for drying purposes. The property is planned to afford as many plain simple two-roomed houses as possible, with the aim of overcoming the objections to one-roomed houses occupied by a family. Out of the fifty-six houses in the block eight are of one room and forty-eight are of two rooms. The cubic contents are: Single rooms (with the exception of one large house on the ground floor), 1,200 cub. ft.; two rooms, 1,800 cub. ft. The ceilings are 9ft. high.

Each house is fitted with bed frames, kitchen range, grate, dresser, coal-box, gas fittings and water supply, with the use jointly with one other tenant of a water-closet on the balcony. There is a dust shoot on each floor and washing-house on the top floor leading on to the drying court on the roof.

The cost of the buildings is equal to 6d. per cub. ft. overhead, calculated as follows: From the bottom of the foundations to the head of the walls and halfway into the roof where it is a pitch roof; where it is a flat roof, to the top of it; where there are balconies the whole width of the balcony is included; where the foundations are not level the average level is taken.

The rents paid by new tenants are as follows: Two rooms, 3s. 2d. per week; one room, 1s. 10d. per week. This includes water, stair gas, and all taxes, including those generally paid direct in Scotland by the tenant to the rating authorities.

For some years after the completion of Cathedral Court the company's building operations were suspended, largely from uncertainty as to the policy of the Glasgow Corporation in providing much-needed housing accommodation for the labouring class. The demand for simple low-rented houses being, however, almost entirely ignored by private enterprise and met by the Corporation only to a very limited extent, the directors purchased ground with old buildings near Bridgeton Cross, the eastern centre of the city. Blocks known as Greenhead Court (see accompanying illustrations) have been erected on the site. Nearly all are on the balcony system, and the plans follow the model of Cathedral Court, but afford greater variety of house in size, style and rental. No tenants, however, in any of the blocks which have been built by the company occupy houses larger than two rooms. The cost of Greenhead Court is not yet finally ascertained, but is expected to be about £19,500. This works out at 5½d. per cub. ft. overhead, calculated as in the case of Cathedral Court.

The dilapidated buildings which have been selected for reconstruction are in four groups, each in a different district of the city. When purchased they were still sound in their main structure, but completely neglected and worn out in their internal fittings, more particularly the woodwork and plasterwork. The plumberwork, where it existed at all, was worse than useless. The houses were of course overrun with vermin and encrusted with filth.

The general result of the reconstructions has been exceedingly satisfactory. The rate of return has been considerably over 4 per cent. on the whole cost after providing for depreciation and repairs.

The first experiment in reconstruction was with four blocks in the east end, formerly the centre of much rowdyism, now known as George Court, and beautified by trees planted by the Gardening Section of the Glasgow Kyrle Society.

As the result of the wonderful improvement effected, the medical officer of health for the city appealed to the directors to acquire and renovate four tenements in a short narrow street on the south side of the river known as Bolton Street, which had become a byword for riotous outbreaks and notorious as a hotbed of fever.

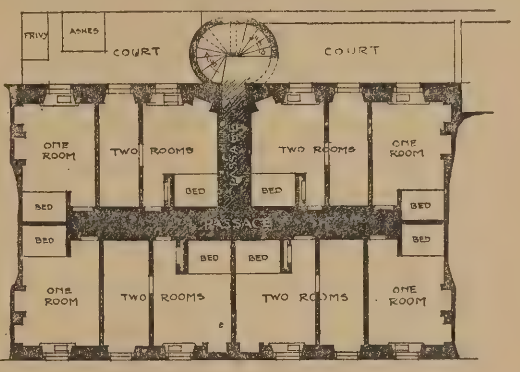
The tenements were acquired and overhauled, and now not only has the character of the buildings been altered, but, with consent of the authorities, the very name of the street has been blotted out and it is now known as Ardgowan Place.

In the autumn of 1898 the directors resolved upon an extension of the work of renovation. Three disgraceful tenements in Brown Street, Port Dundas, were acquired and transformed into Dundas Court.

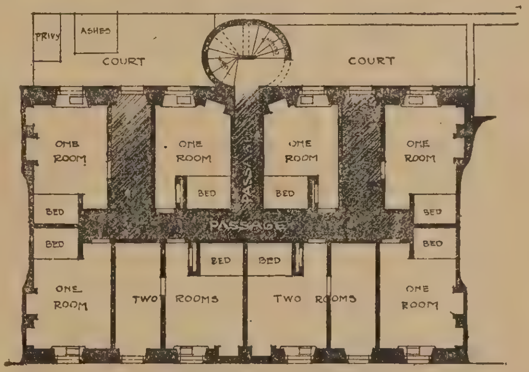
Attention was then directed to Middleton Place, off Carngad Road, in the north-eastern district, a locality bearing a most unenviable reputation for disease and disorder.

As the street itself is narrow—little more than a lane—the directors have taken over at a nominal price sufficient ground for the extension of the back courts of no fewer than fifteen tenements which have been purchased, comprising all the upper part of Middleton Place. The work upon ten of these is completed.

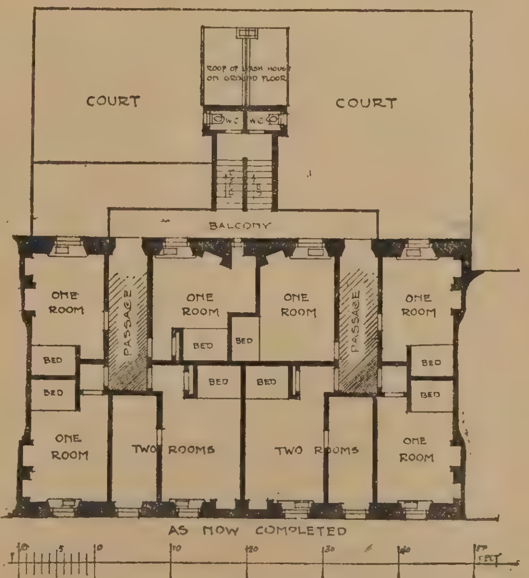
It may be of interest to note that latterly the work of renovating has been done to the satis-



ORIGINAL PLAN



AS ALTERED FOR SANITARY DEPT



AS NOW COMPLETED

NO. 21, MIDDLETON PLACE, GLASGOW.

GREENHEAD COURT, GLASGOW, AND ITS SURROUNDINGS TO THE NORTH.

faction of the company's architects (Messrs. John Burnet & Son) by a working foreman and staff of men employed directly by the company under the supervision of Mr. Biggar, the assistant secretary. It was found impossible to do work of this character satisfactorily through contractors, while on testing the costs by independent measurement a substantial saving is shown. The repairs are also executed by the company's men.

Tenement No. 21, Middleton Place forms an example not only of the company's work but also of the rising standards of sanitary science. The accompanying three plans show that when the property was first built, probably about forty or fifty years ago, all the houses on each flat entered from a passage 44ft. long and completely dark, running along the centre of the tenement. Access to this centre passage was obtained from an entirely dark "lobby" leading from the stair. These two dark passages together took the shape of the letter T. The disastrous effect upon the cleanliness and health of the tenants can be imagined. The only convenience then for the use of the inmates of the thirty-four houses was one privy or dry-closet in the small court.

Owing to the persistent outbreaks of typhus and other infectious diseases, about twenty years ago the medical officer insisted upon the proprietor sacrificing eight small rooms and breaking through inlets for light and air at the ends of each internal passage, but the common privy remained. The alteration is shown in the second plan. The result, however, was still unsatisfactory. When the company acquired the property it was impossible to get access to the houses without groping along to the doors in pitch darkness; so that after very careful consideration the company determined to reconstruct the whole access to the houses by demolishing the old turret stair, building a substantial modern staircase, with balconies right and left giving access to the houses, and adding of course well-ventilated water-closets. In this way the internal "lobbies" have been entirely done away with, and the space they formerly occupied has become habitable, all as shown on the third plan. The cost of this reconstruction has been exceedingly heavy, but it is gratifying to know that the return from the property so far as can be seen at present will not fall below 4½ per cent.

Altogether the company have been exceedingly successful, and are to be congratulated on the very practical way in which they have solved the problems under consideration. One hears so much chatter nowadays about the housing problem that it is a relief to turn to such accomplished experiments as those which have been so satisfactorily made by the Glasgow Workmen's Dwellings Co.; and in conclusion we may note that their work is not altogether confined to its commercial side, as club-rooms have been instituted in each of the properties to afford the tenants some opportunities of social intercourse.

GREENHEAD COURT, GLASGOW.

A Comparative Criticism.

In connection with the foregoing it is interesting to note the interim report which has just been issued by the deputation of the Housing Committee of the Liverpool Corporation who recently visited Glasgow to inspect the Corporation tenements in that city preparatory to drawing up a scheme of artisans' dwellings for Liverpool. They state that the Glasgow tenements are occupied by a class much superior to that which will have to be provided for in Liverpool, Glasgow not having so far attempted to provide for the very poor. The deputation note that one water-closet is provided for four tenements, and all refuse and ashes have to be carried down to ashpits on the ground floor, and in the case of Haghill tenements one ashpit serves sixteen tenements, and no separate yard-space or separate sculleries are provided. All this is in contrast to what has been insisted upon by the Local Government Board in Liverpool, and they consider that to copy Glasgow would be a retrograde step. The deputation do not approve the Glasgow system of filling up floors with dry ashes to render them soundproof, preferring concrete floors and iron joists. Those of Glasgow, it is contended, tend to harbour vermin. On the whole the tenements of Glasgow are good substantial buildings, but the wooden floors did not commend themselves to the Liverpool deputation.

Law Cases.

A Huntingdon Builder's Speculations.—At the Peterborough Bankruptcy Court recently the public examination was held of Frederick Bayliss Thackray, builder and contractor, residing at St. George's House, Huntingdon, and carrying on business under the style of F. B. Thackray & Co. at Ermine Street, Huntingdon. The statement of affairs showed liabilities expected to rank £13,154 15s. 7d., and assets £5,738 19s. 9d., leaving a deficiency of £7,415 15s. 10d. Debtor alleged as the cause of his failure losses through paying his brother Osborne's debts, the failure of Harvey & Williams, Ltd., and inability to realise shares in the Otto Brake Co., Ltd. The public examination will be formally closed on October 18th.

Liability for Timber: An Interesting Case.—In the City of London Court recently the assignee of Mr. William Purkis, timber merchant, sued Messrs. Nicholson & Son, 105, Cheapside, for £68 7s. for timber supplied. Plaintiff's counsel said that the defendants had been building sixteen houses, in Brook Road, Walthamstow. They entered first of all into a contract with one Palmont, sen., who was unable to carry out the contract. In January last they entered into a contract with Palmont's son, by which they undertook to pay him the sum of £1,600 for the completion of the houses. As the young man had neither capital nor plant it was obvious that he could not carry out the agreement without being financed. Palmont, jun., was paid weekly wages for carrying out the work as the foreman bricklayer for the defendants. The plaintiff's case was that the timber now sued for was ordered by Palmont, jun., on the authority of the defendants. The defendants' case was that Palmont, jun., agreed to finish the houses for £1,600. The orders for the timber now sued for were given by Palmont and not by the defendants. There was no truth in Palmont's story that he had been paid weekly wages and that he was acting as the servant of the defendants. He had received £1,800 in all for carrying out the contract. It was true that the defendants had guaranteed some of the orders which Palmont gave, but in all those cases they had paid the accounts themselves. No such guarantee was given in the plaintiff's case and no liability was resting upon the defendants. The deputy judge delivered judgment at great length, and said that the case was one of considerable importance, not only because of the amount in dispute but because of the principles involved. The defendants' contention was that the work performed by Palmont had been done under a contract, and that being the case the timber must be paid for by him. The deputy judge said he could not hold that there was a contract at all. It was true that an agreement had been prepared in solemn form, and that it was sent to Palmont for approval by the solicitors, who were brothers to the defendants. He did not think that Palmont had the ability to understand the matter at all. In his view Palmont was not an independent contractor, and the relationship between the defendants and him was that of master and servant. That being the case, judgment must be entered for the plaintiff for the amount claimed.

The International.—The International Society of Sculptors, Painters and Gravers, whose exhibition opened last Monday at the Institute, is a non-academical, if not actually an anti-academical, body of artists, one of whose moving spirits is Mr. Whistler.

Masters and Men.

The Bricklayers' Strike at St. Albans appears to be gradually dying out, and the fact that the strike secretary has returned to work on the terms offered by the masters when the strike was threatened must have a damaging effect on the position of the strikers.

"The Law relating to Labour Unions" is the title of a pamphlet which has just been published by the Employers' Parliamentary Council, 7, Victoria Street, Westminster; price 6d. It deals with the legal liabilities in connection with picketing, coercion and intimidation; the right to sue and be sued, and the consequent liability of union funds as laid down by recent judgments.

A Meeting of Plasterers' Apprentices was held recently at the Club Union Buildings, Clerkenwell Road, E.C., upon the initiative of Mr. Cale, secretary of the Plasterers' Union. Dr. Garnett, principal of the Northampton Institute, advised the young men present to attend the classes at the polytechnics. They would soon discover that there was a great deal more in the plasterers' craft than they imagined. The foreigner was rapidly ousting the English workman on his own ground, because the Englishman neglected to study the technicalities of his trade.

A Serious Labour Dispute exists at the yard of Messrs. J. F. W. Wilson & Sons, timber merchants, of Sunderland, the cause being that a waggon man did a journey to Newcastle and Shields in a shorter time than the firm's other three waggon men. These demanded the instant dismissal of the quicker man. The firm would not be dictated to, and refused to comply with their request. The three men thereon left work and induced about thirty others, mostly labourers, to do the same. A new man was set to work by the firm, and he was found unconscious near the timber yard, having apparently been attacked by a number of the workmen. He had to be removed to the hospital, where he gradually recovered. The men on strike are mostly members of the Gasworkers' and General Labourers' Union. Some have resumed work.

Labour in the Colonies.—The Emigrants' Information Office, 31, Broadway, Westminster, S.W., state that it is too late in the year to emigrate to Canada in search of employment. In New South Wales the strike of the ironworkers' assistants, which lasted some weeks, has been settled by reference to arbitration; the men demand a uniform wage of 7s. a day, and the employers decline to give that wage to any except first-class men, others to have 6s. The building trade is brisk, and there is a continued demand for plumbers and competent labourers. There is practically no demand for labour at Hillston, Newcastle, Lithgow, Bulli, Young, Mudgee, Wilcannia, Walgett or Bourke. In Victoria the various boards appointed under the Factories and Shops Acts have determined that the lowest wages to be paid to glaziers in the plate-glass trade should be 10½d. an hour. There have been demonstrations of the unemployed in Melbourne, though it is often difficult to procure competent workmen. In Castlemaine, Bendigo, Daylesford, &c., there is no demand for labour. In South Australia the supply of local labour is sufficient. Queensland is still suffering from the drought, and emigrants are not recommended to go there at present, unless they receive nominated passages or take a little money with them. In Western Australia the report of the Government Labour Bureau for the quarter ending the 30th June last shows as follows: There is a demand for competent mechanics in the building and other trades at Northam, Perth and Dongarra, and for sawmill hands at Albany, but otherwise the supply in the colony is quite sufficient, and in some places the supply is in excess of the demand. The last reports from New Zealand show that the building and engineering trades continued busy almost everywhere. In Cape Colony there is officially stated to be a demand for thoroughly skilled mechanics in the building trades. Otherwise all persons are again warned against going to South Africa at present in search of professional or manual work unless they have ample private means to meet the very high cost of living, or have engagements to go to. They will not as a rule be allowed to proceed up country.

Builders' Notes.

Mr. T. Verge, builder, &c., of Bridge Road, Southampton, died recently.

Mr. Edwin Jennings, a builder and carpenter, of 128, The Grove, Hammersmith, died recently at the age of sixty-six years.

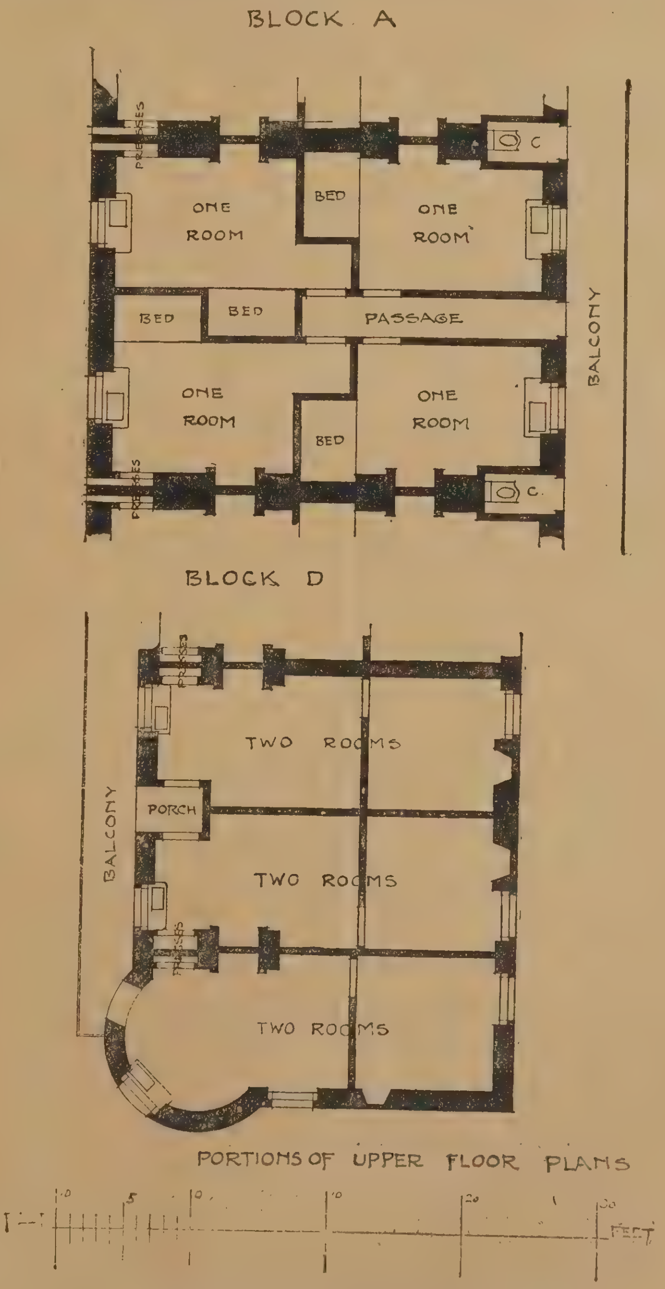
Mr. Thomas Wellman, a builder, of Fordington, died recently at the age of seventy-five years. His son, Mr. Thomas Lewis Wellman, will carry on his father's business.

Mr. Matthew Travis, a builder, of 37, Gardner's Row, Liverpool, died recently. He was connected with the firm of Roberts & Robinson, builders and contractors, for over fifty-seven years.

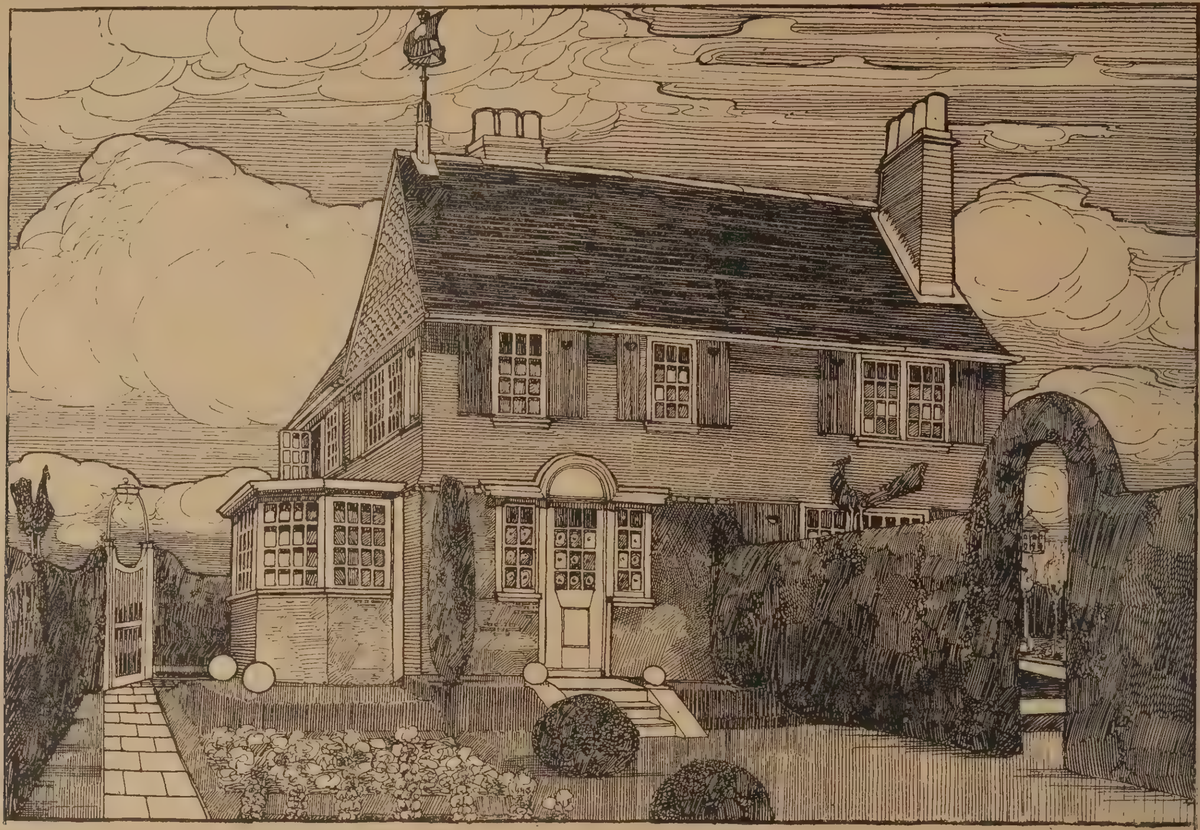
Fire from Lime.—Last Friday smoke was noticed issuing from the buildings of the new Congregational Church at Cricklewood now in course of erection. A fire-engine soon extinguished the flames. The contractor's lime had ignited through the rain leaking through a tarpaulin, and forty bags of lime were destroyed.

The Stock Brick Trade.—The Kent and Essex Brickmasters and Flint Merchants' Protection Association has lowered the price of stocks 4s. a thousand, and has given notice that "on and after October 11th the advance hitherto paid in freights will be taken off, and the freight paid will be according to the Association lists. This removes the last of the advances made to the brick-makers and barge-masters four years ago, when good prices were ruling. The barge-masters received an advance of 3d. per thousand on the freights at that time, but the advances to the brick-makers were taken off last year. The present reduction will affect practically all the barges engaged in the Kent and Essex brick trade. In the Sittingbourne and Milton district, for the first time for several winters, men are being "stood off" from their employment; and in other districts barges are being laid up for the season.

Distinction for the British Fire Prevention Committee.—Official intimation has just reached Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, that a large silver portrait medal accorded by her Majesty the German Empress in connection with the Fire Congress of June last has been presented to the executive of the committee as a mark of appreciation for the services rendered by that body in the demonstration of scientific and economic aspects of fire-protection. It will be remembered that a deputation of the committee comprising Mr. Edwin O. Sachs (chairman), Mr. Ellis Marsland, Mr. F. R. Farrow and Mr. C. E. Goad, accompanied by the secretary and engineer, visited Berlin in the summer, and that an important exhibit of technical models and photographs was loaned to the German authorities for the exhibition held in connection with the Congress.



PLANS OF TENEMENTS IN GREENHEAD COURT, GLASGOW.



COTTAGE AT FARNHAM, SURREY. HERBERT FALKNER, ARCHITECT.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Bending Moment on a Beam.

MANCHESTER.—CONSTANT READER writes: "How can I determine the greatest bending moment on a beam supported at both ends and carrying a distributed load? Rivington (p. 156) works out an example, the formula being $\frac{wl^2}{8}$, whilst other authorities use the formula $\frac{WL}{8D}$. Why are these two (apparently) different formulæ used? What is the relation between them, and whichis the better for practical use? I should also be glad to have a plain common-sense definition of the term 'moment of inertia,' and of what use it is practically."

In the formulæ quoted $w =$ distributed load per ft. run; $W =$ total load, l or $L =$ span; therefore $\frac{WL}{8} = \frac{wl \times l}{8} = \frac{wl^2}{8}$, and either may be used to produce the same result. When D (depth) is inserted in the formula the result is maximum stress in flange instead of bending moment. The maximum bending moment on a beam with a distributed load will be at the centre, and may be found as follows: Let A B be a beam carrying a uniformly distributed load W per ft. run over the span l. Then the total load will be wl and the reaction at A and B $= \frac{1}{2} wl$. The upward reaction at A by $\frac{1}{2} l =$ the positive moment at centre of span. Against this is half the load ($\frac{1}{2} wl$) acting at its centre of gravity ($\frac{1}{4} l$) acting downwards in opposition to the reaction = the negative moment at centre of span. Then the bending moment $= \frac{1}{2} wl \times \frac{1}{2} l - \frac{1}{2} wl \times \frac{1}{4} l = \frac{1}{4} wl^2 - \frac{1}{8} wl^2 = \frac{wl^2}{8}$. The moment of inertia of a section is the summation (or total) of the areas of all the individual fibres (or particles) multiplied by the squares of their distances from the neutral axis. Practically, the moment of inertia gives the value of the section in resisting stresses. A flanged beam has a greater moment of inertia than a solid rectangular beam of the same sectional area, because a greater proportion of the material is at a distance from the neutral axis.

HENRY ADAMS.

Government Surveyors.

LONDON, N.—SURVEYOR writes: "To whom should I apply for an appointment as assistant in the quantity surveyor's department in any of the Government offices, such as the War Office, London County Council, &c.?"

See reply on p. 165 of our issue for April 3rd last.

Examinations for Municipal and County Engineers and Surveyors.

SEAFORTH.—M. I. writes: "Where are the examinations of the Municipal and Sanitary Surveyors' Institute held, and where can I obtain a syllabus?"

Querist does not give the proper name of the association he means. The address of the Incorporated Association of Municipal and County Engineers is 11, Victoria Street, Westminster, S.W.; that of the Sanitary Institute, Margaret Street, London, W.; and that of the Surveyors' Institution, 12, Great George Street, Westminster, S.W. Application should be made to the secretary in each case.

Reflection in Shop Window.

EARLESTOWN.—ANXIOUS ONE writes: "A showroom window facing a main street is rendered almost useless by the reflection of passers-by and of objects on the other side of street. The window bottom is 2ft. above the road and the show-board is about 14ft. wide (from the glass), surrounded on the other three sides by a dark curtain. The light only comes through the plate-glass window in the front, yet an article cannot be distinctly seen from the street at any time during the day, and especially when the sun is shining. What is the cause of this reflection, and how can it be remedied?"

The cause of the reflection is that the background is too dark; and we may instance in this connection the difficulty of looking out of a window when the outside is dark and the inside brilliantly lighted, or the corresponding ease when the conditions are reversed. The defect can be remedied by either casting a shade on the front of the window or by making the background light. If the side curtains can be removed and a sidelight thrown from the back it would be still better.

Architectural Draughtsmanship.

GLASGOW.—EXHIBITION writes: "Where can I obtain inexpensive books on (1) hints on draughtsmanship, (2) glosssary of architectural terms, (3) method of drawing perspectives of buildings?"

(1) "Hints on Architectural Draughtsmanship," by G. W. Tuxford Hallatt (price 1s. 6d.; E. & F. N. Spon, Ltd.); "Architectural Drawing," by R. Phené Spiers (price 10s. 6d.; Cassell & Co., Ltd.). (2) The best general glossary of architectural terms appeared in "Specification: No. 3" (published from these offices, price 5s. nett). (3) "Linear Perspective," by G. A. T. Middleton, A.R.I.B.A. (price 1s.; B. T. Batsford).

Maker of Patent Ladder.

NORTHWICH.—J. A. B. writes: "Do you know the address of the maker of a patent ladder which has an iron rod running through the wood spindle, screwed and riveted tight on the outside? I bought one at the Liverpool show two years ago."

We regret we are unable to furnish our correspondent with the desired information. We understand that a Mr. Baker organised a building trades' exhibition at Manchester last year and at Liverpool the year before, but this is not *the* Building Trades' Exhibition, which is always held at the Agricultural Hall, Islington.

P.C. Items in Bills of Quantities.

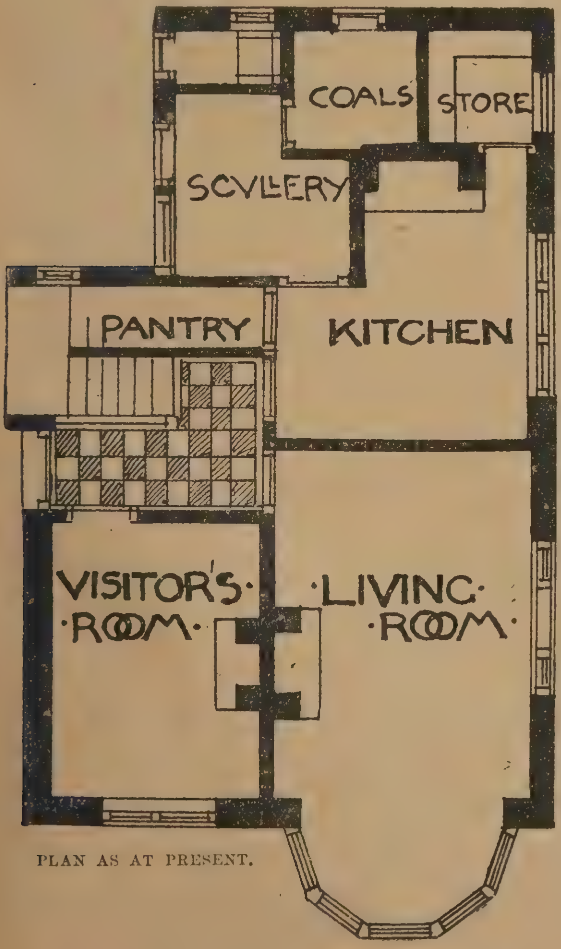
CARDIFF.—OMEGA writes: "In a bill of quantities I have put several prime cost values for materials and fittings to be selected by myself, including hot-water apparatus with an item attached 'Allow for profit and waiting upon same.' I find that the contractor whose tender is accepted has put nothing against the latter item. Can he now charge me for waiting upon and making holes, &c., for the hot-water engineer?"

This raises the eternal question: "What is 'Prime Cost'?" Our correspondent's interests will be protected if he has a clause in the contract or specification to the effect that the contractor is to do everything necessary to the completion of the building without extra charge; or, if the contractor has priced a general item in the bill of quantities, allowing for waiting upon all trades; or if the contractor has given a lump sum for the entire job on a special form of tender. If, however, the quantities were somewhat in the nature of a schedule of prices the question is a debatable one. In any case you should always require the builder to send the priced quantities to the quantity surveyor to be examined by him and sealed before accepting a tender finally, to ensure that every item is priced. The contractor often neglects p.c. items, as he generally reckons on being allowed to order the goods himself and obtain special discounts of which the architect is ignorant. We know of one large firm of contractors that used to send round to the firms that supplied special articles such as water-closets and hot-water fittings, with whom they had large dealings, to inform them that the architect would be calling or sending for quotations in a few days for special goods, and they must reserve 10 per cent. or more for the contractors out of the price they quoted him. Thus, the firm very often made as much as 25 per cent. profit on p.c. items—10 per cent. from the architect and the rest from the merchants. The only satisfactory method of preventing this is for the architect to order and pay for the goods himself, but he must make this clear to the contractors when tendering. If he cannot do this, he should allow the contractor to order the goods, avoiding as many p.c. items as possible.

Society of Architects' Examinations.

Newport, Mon.—D. I. L. writes: "What books would you recommend for the M.S.A. examinations; also, where could I get a list of coaches for this examination?"

Mr. B. T. Batsford, of 94, High Holborn, W.C., will supply you with a most useful list of standard books on the various subjects in the examination, and you can choose from it. The names of several coaches will be found in our advertisement columns.

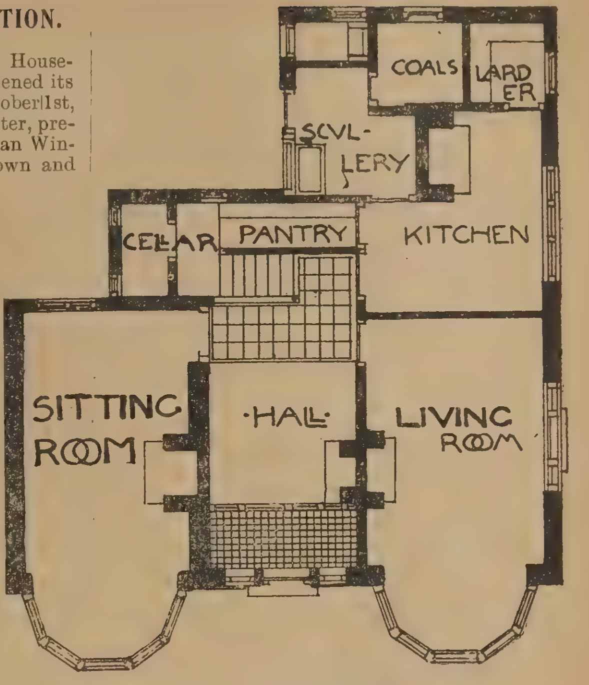


PLAN AS AT PRESENT.

HOUSE DECORATORS' ASSOCIATION.

The National Association of Master House-Painters and House Decorators opened its eighth annual convention on Tuesday, October 1st, at Leicester. Mr. J. W. Barker, of Leicester, presided. The Mayor of Leicester (Alderman Windley) welcomed the Association to the town and congratulated them on their successful efforts to raise the standard of decorative art. Mr. T. W. Latto, president of the Master-Painters' Association of Scotland, and Mr. J. Sibthorpe, vice-president of the Irish Association, also spoke of the excellent work which had been accomplished. Sir J. Rolleston, M.P., then opened an exhibition of decorative art and of the work done by apprentices of members of the Association in competition for the awards offered. He said one of the most notable features in the progress of the industries of this country was the great improvement in the art of house-decoration. This was not only observable in the mansions of the rich, but in the houses of the people and in the places of amusement to which they resorted. All round there was great advance in taste and refinement, and that was in great measure due to the skill and brains of the members of their Association. The annual report stated that sixty members had been added during the year, while branch associations had been opened at Loughborough, Macclesfield and Halifax.

The meeting was resumed on Wednesday. Mr. H. Looke, of Hull, read a paper on "What to Teach our Apprentices," in which he advocated the extended use of good handwork instead of manufactured ornament. He urged the importance of drawing combined with technical and chemical knowledge. Mr. Walter Crane then read a paper on "Some Thoughts on House Decorations." The domestic interior, he said, afforded the best visible evidence both of the standard of living and refinement and of the sense of beauty of any age or country. In proportion as the conditions of human life became more and more artificial and removed from nature, man seemed to require the aid of art. Decoration, indeed, might be regarded as a sort of æsthetic compensation for the increased artificiality, complexity and restraint of civilised life. The decorative designer certainly depended largely for freshness of inspiration and suggestion in design and colour upon growing plants and flowers, upon the sight of birds and animals, upon the ever-changing sea and sky, and upon the colours of the landscape. The practice of living in flats and residential hotels involved a contraction of space and light that could not have a favourable physical effect or foster a healthy sense of decoration. On the other hand, the collective dwellings of which they saw the germs in the better type of modern flats, with a common kitchen and dining hall, might have an important future; and there was no reason why, given favourable conditions, dwellings on the plan of collective living or collective homes should not have dignity and beauty as well as the comforts of a home. From the decorator's point of view the plan and scale of such collective dwellings might afford fine scope for art. Whether inside or outside, the town house required constant cheering up by the painter and decorator, but it must be the decoration that cheered and not inebriated. He was glad that a determined effort was being made to return to simplicity in house-designing, furniture and decorations. Mr. Fletcher, head-master of the Leicester School of Art, afterwards read a paper on "The Value of Design and Reticence in Decoration." Mr. Graham Cole, of Newcastle, was elected president for the ensuing year.



FUTURE EXTENSION.

Keystones.

Death of Mr. James Brooks.—At the moment of going to press we learn with deep regret of the death of Mr. James Brooks, F.R.I.B.A., the well-known church architect. A biographical notice will appear in our next issue.

A Balmoral Memorial to Queen Victoria.—The movement to rear a granite obelisk to the memory of Queen Victoria, which has been discussed for some time past among the tenants on the Balmoral estate, has received the approval of the King. The exact terms of the inscription on the base have not yet been decided.

The Parish Church at Whittington has been reopened after alterations and improvements, including re-seating throughout, the repairing of the wood-block pavements, and the provision of new kneeling-rails throughout. The improvements have been carried out by Mr. Thomas Sanderson, of Whittington, at a cost of about £275.

The Sale of Battle Abbey.—With reference to the prospective sale of Battle Abbey, Mr. Hamilton Hall, F.S.I., intimates that at the next meeting of the Sussex Archæological Society he will propose that a fund be raised for purchasing the building as a county museum and library. Lord Rosebery has also been mentioned as a probable purchaser.

A Queen's Memorial in Rhodesia.—The people of Salisbury, Rhodesia, have resolved that the Victoria Memorial for the province of Mashonaland shall take the shape of a museum and library, and, if funds permit, a public hall. A strong minority of the subscribers favoured the erection of a statue of the late Queen, and a novel feature is the keen interest taken in the matter by the natives, who are subscribing to the fund.

The Architectural Association of Ireland.—In their report on the session 1900–1 the Committee express disappointment at the lack of interest taken in the numerous prizes offered for competition by the Association. Only one set of drawings was submitted for the travelling studentship, and the whole of the other prizes competed for were taken by two students. One of the most important features of the past session was the series of technical demonstrations suggested by Mr. Frederick Batchelor, F.R.I.B.A., which consisted in visits to various building and other workshops. Such a scheme is highly profitable to students, as it gives them a practical grasp of their work. The total membership of the Association is now 128, and the statement of accounts shows a balance to the good of £64 5s. 10d.

Hampsthwaite Church is about to be restored.

The Collegiate School for Girls, Bournemouth, has been enlarged by the addition of a new wing, comprising a commodious gymnasium and six class- and bed-rooms.

Alyth Y.M.C.A. New Hall was opened recently It has cost £1,150. The buildings are situated in Commercial Street. There is a hall capable of seating 120 persons, and is also fitted up for a gymnasium. There are also a reading-room, public bathroom, lavatories and caretaker's house on the premises.

Much Bricklaying.—In connection with the memorial stone laying at the new Temperance Hall at Lincoln recently there was a bricklaying ceremony, when nearly 300 members of the Temperance organisation each laid a brick, and contributed 5s. to the fund.

Victoria Memorial Windows.—New Queen Victoria memorial windows have been erected in St. Nathaniel's Church, Cotham. There are three windows of two lights each. The work has been carried out by Mr. T. Griffiths, of Easton Road, Bristol.

Mr. William Watson, a well-known West Riding architect, died last week at Wakefield. Deceased, who was sixty years of age, was one of the surveyors of dilapidations for the Wakefield diocese and a prominent member of the Wakefield Chamber of Commerce and Shipping. He had for many years been one of the principal architects of Wakefield, and had prepared many plans for churches, chapels, schools and other public buildings, his latest work including the designs for the Wakefield Workhouse Infirmary, and the new Board schools at Lofthouse Gate opened last Saturday week.

The Site of Ninevah.—Mr. Leonard King has left London on behalf of the British Museum for the purpose of inspecting the mounds at Konyunjik, the traditional site of part of the city of Ninevah, and reporting on their condition. It will be remembered that this was the scene of the excavations and discoveries of Sir Austen Layard (1845–7, 1849–51), of Mr. Hormuzd Rassam (1854) and Mr. George Smith (1873-6). As the result of their labours the general outline of the city was brought to light, the ruins of four palaces were discovered, and in thousands of clay tablets was found the great library of Asurbanipal, the greater part of which is in the British Museum.

At Sturminster Newton Church a screen has been erected to the memory of the late Mr. Dashwood, who was for over thirty years churchwarden, in the eastern bay in the north transept, and thus divides the organ chamber from the main portion of the ancient fabric. It is made entirely of well-seasoned and carefully selected English oak, and is carried up the full height of the pointed arch which forms the bay. The screen is of fifteenth-century character, to harmonise with the immediate surroundings. It has been carried out—from the designs and under the direction of Messrs. Dunn & Ingledew, architects, of Gateshead—by Messrs. Harry Hems & Sons, of Exeter. The new screen is carried up by five uprights, thus dividing it into four distinct portions. These are panelled and enriched by tracery and carved work. Higher up there is a carved cornice surmounted by an ornamented cresting. The tracery fills the whole space within the arch.

A New Methodist Chapel at Baptist Mills, Bristol, has just been renovated. The whole exterior of the chapel has had a covering of new cement. A new entrance with pilasters and cornice leads into a lobby with tiled floors and pitch-pine screens glazed with cathedral glass in leaded lights. Inner lobbies with swing doors are on each side of the lobby, and from these lead staircases to the galleries; for exit from these there are outer doors at each side. The interior has been re-decorated. New gas pendants and brackets with incandescent burners and a new hot-water apparatus have been provided for the chapel and school premises. The cost of the whole work is about £1,200. The general contract has been carried out by Mr. A. G. Matthews, of Redcliff Hill, and the heating apparatus by Messrs. Skinner & Co., Stokes Croft. The architects are Messrs. La Trobe & Weston, F.R.I.B.A., of Clare Street, Bristol.

Giggleswick School Chapel was dedicated last Friday.

A New Cottage Hospital for Whitby has been erected in Grape Lane at a cost of about £1,100.

A New Wesleyan School for Winton, Blackburn, is being erected to cost about £2,000. The new school will accommodate 700 scholars.

New Stained-Glass Windows have been erected in the baptistery of St. Peter's Church, Abbeydale Road, Sheffield, and have been executed by Messrs. Jones & Willis, of Birmingham.

Mr. William Swift, architect and surveyor, of Truro, died recently at the age of fifty-one years. Mr. Swift had resided in Truro twenty years, and was with Messrs. Henderson at the Mining School before starting to practice for himself eight years ago.

Fletton Parish Church, owing to a large increase in the populotion of Fletton consequent on the extension of the brick industry, has been enlarged by doubling the width of the north aisle of the church. The work was entrusted to Mr. Boyer, architect, Peterborough.

"The Eighteenth-Century Architecture of Bath" is the title of a book by Mowbray A. Green, A.R.I.B.A., which will shortly be published by Mr. George Gregory, of Bath. The book will be illustrated by 100 plates, together with plans, sections and other architectural details. It will be issued in four parts, large quarto, at the price to subscribers of 7s. 6d. per part.

A Hull Church Improvement.—At St. Augustine's Church, Hull, in Prince's Road, a new tower and porch is being erected. The tower will rise to the height of 75ft., will be built from designs by Mr. Temple Moore, London, and will be in harmony with the rest of the edifice. Its estimated cost is £1,200. New Sunday schools are also being erected to cost an additional £1,300.

New Baths and Washhouses at St. Pancras have been erected in the Prince of Wales Road, Kentish Town, upon an area of about 35,000 sq. ft., and comprise four swimming baths and a public washhouse with fifty washing compartments. Two of the swimming baths have each a pond 100ft. long by 33ft. wide. The first-class bath can be arranged as a public entertainment hall for the winter months, for which purpose it is capable of seating 1,200 persons.

Building Collapse at Newport, Mon.—A large block of shop premises at the corner of High Street and Griffin Street, Newport, Mon., collapsed early last week through the failure of an 18in. brick pier which supported heavy iron joists on which the middle portion of the premises rested. The collapse was probably caused by the subsidence of the ground. Messrs. Habershon & Fawckner were the architects of the building, which was completed in 1891 by Mr. Charles Lock, builder, of Newport.

A Naval Monument.—The committee of the Royal Marine Memorial Fund has commissioned Mr. Adrian Jones, the well-known sculptor, to execute a monument to the memory of the men who died heroically in China and in South Africa. The memorial will consist of two soldiers of the Royal Marines, one wounded lying on the ground, the other standing erect and defiant with bayonet fixed. There will be bas-reliefs on either side of the pedestal showing the regimental badge and motto: on the front and back will be the names of the fallen heroes, while at each corner a dolphin will be placed. The figures will be 8ft. high, and it is hoped that a suitable site will be found near the Admiralty.

The Additions to St. Saviour's Church, Ravensthorpe, were consecrated recently. The addition to the church consists of transepts, a north chapel and a large vestry chancel, and the north aisle is to be added with clearstory and arcading to the nave, the cost in all being estimated at £8,500. Upon the additions just consecrated about £6,500 has been expended. Mr. C. H. Fowler, F.S.A., of Durham, prepared the designs, and Mr. Thickett, of Horbury, has carried out the work. The walls are substantially built of stone with faced dressings and buttresses, and the roof is of red tiles. The windows are fitted with cathedral glass. The altar rails are of oak on iron and brass standards. There is no reredos at present, a plain dossal taking its place. Green-stained chairs are used for seating.

An International Exhibition at Edinburgh in 1904 or 1905 is proposed. At a meeting of citizens held last week a committee was appointed to consider the question of site and other preliminary matters.

"The Scientific Roll," a magazine of systematised notes published by Mr. R. L. Shorland, of 38, Churchfield Road, Acton, W. (price 1s.), has just reached its third number, which completes the general bibliography relating to bacteria.

The Alterations at Windsor Castle, made by the King's orders, are so extensive that the old guidebooks will now be useless. In addition to new billiard and smoke rooms, the state apartments are completely changed.

The Ancient Cathedral of St. Brendon, of Clonfert, with its "matchless doorway," its Romanesque east window, and its quaintly-carved chancel arch, has had its discoloured plaster and mouldering woodwork renovated and alterations made to prevent damp.

A Find interesting to antiquarians has been made on the south side of the River Clyde, near Dumbarton. Mr. John Bruce has come upon a crannog or pile dwelling of the Roman period, which is regarded by some leading antiquarians as a notable discovery, equalling in importance the famous Dumbreck crannog find.

The Clergy and Artists Association held a small exhibition in connection with the Church Congress. The artists contributing included Mr. Walter Crane, Mr. G. F. Bodley, Mr. Reginald Hallward, Mr. Louis Davis, Mr. J. J. Guthrie, Mr. W. Goscombe John, Mr. W. B. Reynolds, Mr. A. H. Skipworth, Mr. E. S. Prior, Mr. Aylmer Vallance, Mrs. Hallward, Miss Ruby Levick, Miss Evelyn Underhill and Miss Mary Newill.

The Exhibition of the Welsh Industries Association was reopened at Cardiff last week. A feature was the great improvement in quality of many of the exhibits. This was notably the case in the weaving section, both as regarded colour and texture. Carpet and curtain weaving showed a great advance, and the cloths for men's wear were declared by the expert judges to be softer and of better texture than heretofore. The exhibits in the woodwork section received high praise from Mr. Goscombe John, A.R.A.

The Church of St. George, Chichester, is now in course of erection, and is intended to be the new parish church of Rumboldsdwhyke. It is close to the vicarage, on a portion of the glebe near the junction of Cleveland and Whyke roads. The old parish church does not afford sufficient seating accommodation for the population which has sprung up in the parish. £3,500 is the amount of the contract with Messrs. Dove Brothers, the builders. The new church will be built of brick, with stone dressings for the windows, and will be a simple structure in the style of the thirteenth century.

NEW PUBLIC BATHS AT CHESTER.

NEW public baths were opened at Chester recently. There are two plunge baths. The larger of the two, or second-class bath (to be known as the Atlantic) for males, is 75ft. long and 35ft. wide, with a depth of water varying from 3ft. 6in. at one end to 7ft. at the other, and surrounded by dressing compartments and up above a gallery in which at water polo and swimming matches there will be accommodation for spectators. When it is not in use as a bath the fittings can be removed, and this bath can be adapted to a gymnasium or for any other purpose. The first-class plunge bath (to be called the Pacific) is rather smaller, being 60ft. by 30ft., and will be reserved for ladies on certain days. There are seven second-class slipper baths and one vapour, three men's first-class slipper and one vapour, and four women's slipper baths, with waiting-rooms and separate entrances for the sexes. The water used in the baths will be taken from the city mains and heated to whatever temperature may be required. The baths themselves will be heated throughout with steam. The cost of the baths, which are built in stone and Ruabon bricks, was estimated at £11,000, but this sum has been considerably exceeded. The architects were Messrs. Douglas & Minshull, and the contractor Mr. W. W. Freeman.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Oct. 11	Edinburgh—Cookery Room, Workshop and Gymnasium	School Board	Mr. Carfrae, 3 Queen Street, Edinburgh.
” 11	Upholland, Lancs—Wall	Urban District Council	C. E. Senior, Clerk and Surveyor, Council Offices, Upholland.
” 12	Devizes, Wilts—Visiting-room at Asylum	County Council	C. S. Adye, County Surveyor, County Offices, Trowbridge.
” 12	Cheltenham—Town Hall	Corporation	E. T. Brydges, Town Clerk, Municipal Offices, Cheltenham.
” 12	Farningham—School	School Board	J. H. Tait, Architect, Dartford, Kent.
” 12	Berkhampstead—Additions and Alterations	Guardians	C. H. Rew, Architect, Berkhampstead.
” 12	Whitehead—Villa and Stabling	———	'. Russell, 22. Waring Street, Belfast.
” 12	Beddgelert—Villa	———	O. M. Roberts & Son, Architects and Surveyors, Portmadoc.
” 12	Filey—Two Houses	———	G. Mallinson, Architect, Filey.
” 13	Stelling—House	Mr. Thomas Major	H. Videan, Architect, Eversley, Bournemouth Road, Folkestone.
” 14	Belfast—Slates, Firebricks, &c.	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
” 14	Beckenham—Two Cottages..	Urban District Council	J. A. Angell, Surveyor, Beckenham.
” 14	Taunton—Bedrooms, &c.	Committee of Hospital	J. Houghton Spencer, 5 Hammet Street, Taunton.
” 14	Batley—Extensions	———	C. H. Marriott, Son & Shaw, Architects, Church Street Chambers, Dewsbury.
” 14	Hessett—Enlargement	School Managers	School House, Hessett.
” 14	Bristol—Extension of Shed "M"	Docks Committee	W. W. Squire, Engineer's Office, Cumberland Basin, Bristol.
” 14	Pontefract—Two Houses	Mrs. A. L. Robinson	C. Keyworth, Architect and Surveyor, Bank Chambers, Pontefract.
” 15	London, S.E.—Receiving Ward at Workhouse ..	Lambeth Parish Guardians	Fowler & Hugman, 9 Craig's Court, Charing Cross, S.W.
” 15	Braintree—Cattle Market	Urban District Council	F. Whitmore, Architect, Chelmsford.
” 15	Slough—Gasworks	Gas and Coke Co.	T. Webb, Engineer and Manager, Gas and Coke Co., Slough.
” 15	Sligo—New Chapel	District Lunatic Asylum	Sir Thomas N. Deane & Son, 15 Ely Place, Dublin.
” 15	Llwynypia, Wales—Houses..	Pontrhondda Building Club	W. C. Pritchard, Glamorgan Coal Company's Office, Llwynypia.
” 15	Kendal—Walling	Town Council	R. H. Clucas, Borough Engineer and Surveyor, Kendal.
” 15	Carlisle—Houses	———	Johnstone Brothers, 30 Lowther Street, Carlisle.
” 15	Bristol—Baths	Baths Committee	T. H. Yabbicorn, 63 Queen Square, Bristol.
” 15	Hampstead—Parochial Hall	———	J. B. Lofting, 37 Old Queen Street, Westminster.
” 15	Keighley Rebuilding Station Inn	Midland Railway Company..	Mills & France, 99 Swan Arcade, Bradford.
” 16	Manchester—Police and Fire Station	Watch Committee	City Surveyor's Office, Town Hall, Manchester.
” 16	Witham—Infants' School	School Board	W. P. Perkins, Surveyor to the Urban District Council, Witham.
” 16	Bradford—Villa Residence	———	S. Spencer, 314 Great Horton Road, Bradford.
” 17	Shenfield, Essex—Farm House	———	Smith & Marshall, Surveyors, Chippenham, Wilts.
” 17	Southwold, Suffolk—Stables and Coach Houses ..	Colchester Brewery Co., Ltd.	G. H. Page, Architect, Trinity Chambers, Colchester.
” 17	Clay Cross—School, &c.	Clay Lane Urban District School Board ..	Rollinson & Son, 13 Corporation Street, Chesterfield.
” 17	Shirley Woodside, near Croydon—School Buildings ..	Guardians of St. Olave's Union	A. H. Newman, 31 Tooley Street, London Bridge, S.E.
” 17	Stockton-on-Tees—Refrigerating Chambers, &c. ..	W. D. Mark & Son	Harrison & Hunter, 69 & 70 High Street, Stockton-on-Tees.
” 18	Hull—Underground Convenience	Corporation	A. E. White, City Engineer, Town Hall, Hull.
” 19	Sheffield—Baths and Library	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
” 19	Pontlottyn, Wales—School	Gelligaer School Board	James & Morgan, Charles Street Chambers, Cardiff.
” 19	Newry—Rebuilding Workhouse	Guardians of Union	W. R. Bell, Clerk's Office, Workhouse, Newry.
” 21	Middleton—Shed and Workshops, &c.	Electric Traction Co., Ltd....	A. L. Barber, Secty., Donington House, Norfolk St., Strand, W.C.
” 21	Armley, near Leeds—Boardroom, &c.	Guardians of Bramley Union	P. Robinson, 72, Albion Street, Leeds.
” 21	Radcliffe, Lancs—Wall, &c.	Urban District Council	W. L. Rothwell, Surveyor, Council Offices, Radcliffe.
” 21	Newquay, Cornwall—Schools, &c.	St. Columb Minor School Board	J. Pearce, 1 Lehenver Villas, Newquay.
” 21	London, W.—Bricks, &c.	Great Western Railway Company.. ..	Stores Superintendent, Swindon.
” 22	Plaistow—Double-tenement Houses	West Ham County Borough	Borough Engineer's Office, Town Hall, West Ham, E.
” 24	Fulbourn, near Cambridge—Wing to Asylum	———	A. P. Macalister, 20, St. Andrew's Street, Cambridge.
” 28	London, N.E.—Three Workshops, &c.	Governors of Hackney Institute	A. W. S. Cross, 58 Conduit Street, Regent Street, W.
” 28	Gt. Northern Railway Co., Ireland—Stationmaster's House, &c.	Directors	Company's Engineer, Amiens Street Terminus, Dublin.
” 29	West Kensington—District Post Office	Commissioners of H.M. Works	H. Tanner, H.M. Office of Works, Storey's Gate, London, S.W.
” 30	Cheltenham—Town Hall	Corporation	E. T. Brydges, Town Clerk, Municipal Offices, Cheltenham.
Nov. 1	Navan, co. Meath—Alterations, &c., to Convent ..	———	Loretto Convent, Navan, co. Meath.
	ENGINEERING:		
Oct. 11	Welburn—Water Supply	Rural District Council	R. Richardson, Engineer to Council, Town Hall, Malton.
” 11	Malton, Yorks—Waterworks	Rural District Council	R. Richardson, Engineer, Town Hall, Malton.
” 11	Garforth, Yorks—Water Main, &c.	Agricultural Council	C. H. Marriott, Son & Shaw, Church Street Chambers, Dewsbury.
” 12	Wenlock—Water-level Indicators	Madeley & Broseley Joint Water Committee	Mr. Stooke, Severn Villa, Shrewsbury.
” 12	Aspatria, Cumberland—Waterworks	Joint Water Board	Pickering & Crompton, 11 Lowther Street, Whitehaven.
” 12	East Donyland, Essex—Borehole	Rural District Council	Sands & Walker, Angel Row, Nottingham.
” 14	Kirkcaldy—Switchboard	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
” 14	Colchester—Hot-water Apparatus	Guardians	Master at the Workhouse, Colchester.
” 14	Southampton—Reconstructing Landing Steps.. ..	Harbour Board	Board Offices, Town Quay, Southampton.
” 15	Stockport—Condensers	Gas and Electricity Committee	S. Meunier, Engineer, Stockport.
” 15	Bournemouth—Concrete Foundations	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
” 15	Luton—Fittings, &c....	School Board	School Board Offices, Luton.
” 15	Leeds—Motor Cars	Corporation	T. Hewson, City Engineer, Municipal Buildings, Leeds.
” 15	Buckfastleigh, Devon—Waterworks	Urban District Council	T. W. Stainthorpe, Gate House, Totnes, Devon.
” 15	Rochdale—Gravitation Main	Corporation	J. Mansergh, 5 Victoria Street, Westminster.
” 15	Fishguard, Pembrokeshire—Extension of Pier	Railways and Harbours Company.. ..	Secretary, Paddington Station, London.
” 16	London, E.—Potato Steamer	Guardians of Poplar Union..	Master of the Workhouse, London, E.
” 16	Newchurch, Isle of Wight—Water Supply Works ..	Rural District Council	Rural District Council Offices, Pyle Street, Newport, I.W.
” 16	Shalfleet, Isle of Wight—Waterworks	Rural District Council	S. E. Tomkins, Engineer, Newport.
” 16	Enniscorthy—Lighting	District Asylum	Resident Medical Superintendent, District Asylum, Enniscorthy.
” 17	Cannock, Staffs—Waterworks	Rural District Council	R. E. W. Berrington, Bank Buildings, Wolverhampton.
” 17	London, E.—Lamp Fittings, &c.	Electrical Committee..	A. Wright, 27 Osborn Street, E.
” 18	Batley—Plant	Corporation	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
” 18	Darlaston—Reconstruction of Tramways	British Electric Traction Co., Ltd. ..	Chief Engineer of the Company, Donington House, Norfolk Street, London, W.C.
” 18	Stourbridge—Tramways	British Electric Traction Co., Ltd. ..	Chief Engineer of the Company, Donington House, Norfolk Street, London, W.C.
” 19	Annalong, co. Down, Ireland—Harbour Improvements	Down County Council	County Surveyor, Court House, Downpatrick.
” 21	Youghal—Ventilating Apparatus..	District Lunatic Asylum	H. A. Cutler, Municipal Buildings, Cork.
” 21	Newport, Mon—Winches, &c.	Corporation	H. F. Parshall, 8 Princes Street, Bank, London, E.C.
” 21	Cork—Heating, &c.	District Lunatic Asylum Committee ..	H. A. Cutler, Municipal Buildings, Cork.
” 21	Blackpool—Tramway Extensions	Corporation	R. C. Quin, Electricity Works, West Caroline Street, Blackpool.
	IRON AND STEEL:		
Oct. 14	Dublin—Rails, &c.	Great Northern Railway Co. (Ireland) ..	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
” 14	Belfast—Iron and Steel Castings	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
” 17	Croydon—Man-hole Steps and Covers, &c.	Corporation	Waterworks Stores, Surrey Street, Croydon.
” 21	Ramsgate—Pipes	Corporation	W. A. M. Valon, Engineer, Ramsgate
” 21	London, W.—Ironwork and Tools..	Great Western Railway Co.	Stores Superintendent, Swindon.
” 23	Christiania—Rails, &c.	———	Railway Manager's Office, Christiania.
Nov. 11	London, S.W.—Rails, &c.	———	Agent-General for Victoria, 15 Victoria Street, London.
	PAINTING AND PLUMBING:		
Oct. 12	Bradford—Painting, &c.	School Board	Architect, School Board Office, Bradford.
” 14	Belfast—Paints, &c.	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
” 14	Knutsford—Painting and Limewashing	Bucklow Union Guardians	R. J. McBeatt, Architect, Birnam House, Sale.
” 21	London, W.—Colours, Paints, &c..	Great Western Railway Co...	Stores Superintendent, Swindon.
	ROADS AND CARTAGE:		
Oct. 12	Cockermouth—Widening	Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
” 12	Bexhill—Stone	Urban District Council	E. S. Douglas, Clerk, Town Hall, Bexhill.
” 12	Broadstairs—Tar-paving	Urban District Council	H. Hurd, Town Surveyor, Broadstairs.
” 12	Harrow—Street Improvement, &c.	Urban District Council	J. P. Bennetts, Engineer and Surveyor to the Council, Harrow.
” 14	Hanwell—Broken Granite	Urban District Council	P. J. Dennis, Clerk, Urban District Council Offices, Hanwell, W.
” 14	London, W.—Granite	Urban District Council	Council Offices, Hanwell, W.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE—*continued.*		
Oct.	14	Windsor—Kerbing, &c.	Rural District Council	M. Menzies, Englefield Green, Surrey.
"	14	York—Street Works	Corporation	City Engineer's Offices, Guildhall, York.
"	15	Dover—Street Improvement	Town Council	H. E. Stilgoe, Town Hall, Dover.
"	15	Tottenham—Supplying and Laying Paving	Urban District Council	W. H. Prescott, Coomes Croft House, 712 High Road, Tottenham.
"	15	Hornsey—Paving, &c.	Urban District Council	E. J. Lovegrove, Southwold Lane, Highgate, N.
"	16	Chatham—Roadways	Trustees of Watts's Charity	J. W. Nash, Trustees' Surveyor, Rochester.
"	16	Croydon—Making-up	Rural District Council	R. M. Chart, Town Hall, Croydon.
"	16	Southend-on-Sea—Wood-paving Roadway	Corporation	A. Fidler, Borough Engineer, Southend-on-Sea.
"	17	Luton—Paving, &c.	Town Council	Borough Surveyor, Luton.
"	17	Croydon—Paving, &c.	Corporation	Corporation Roads Depôt, Factory Lane, Croydon.
"	17	Amwell End—Kerbing	Ware Urban District Council	J. Elliott Smales, Surveyor, New Road, Ware.
"	19	London, E.—Barging away	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
"	21	Hoddesdon, Herts—Kerbing, &c.	Herts County Council	U. A. Smith, 41 Parliament Street, S.W,
Nov.	30	Johannesburg—Pavements	——	"The Times," London, E.C.
		SANITARY:		
Oct.	11	Malton, Yorks—Drainage Works	Rural District Council	R. Richardson, Engineer, Town Hall, Malton.
"	12	Dovenby, nr. Cockermouth—Sewerage Works	Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
"	14	Hastings—Sewer, &c.	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
"	15	Cotherstone, Durham—Sewage Works	Startforth Rural District Council	J. E. Parker, Post Office Chambers, Newcastle-on-Tyne.
"	16	Croydon—Sewers	Rural District Council	Chart, Son & Reading, Union Bank Chambers, Croydon.
"	16	Barlby—Sewage-Disposal Works, &c.	Ricall Rural District Council	E. J. Silcock, 10 Park Row, Leeds.
	25	West Hartlepool—Sewerage Scheme	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
	28	Newhaven, Sussex—Sewer, &c.	Urban District Council	F. J. Rayner, Town Surveyor, Newhaven, Sussex.
	28	Gosport—Sewers, &c.	Urban District Council	R. St. George Moore, 17 Victoria Street, Westminster, S.W.
		TIMBER:		
Oct.	14	Belfast—Logs, Deals, &c.	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
"	21	London, W.—Telegraph Poles	Great Western Railway Co.	Great Western Railway Co., Stores Superintendent, Swindon.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct.	21	Leeds—Public Baths at Junction of Calveley and Broad Lanes, at cost not exceeding £8,000.	£30, £20, £10 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
"	21	Leeds—Public Baths and Branch Free Library in York Road, at cost of £15,000.	£50, £30, £15 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
"	29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
"	31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov.	23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
"	23	Bexhill—Isolation Hospital	£25.	E S. Douglas, Town Hall, Bexhill.
1902. Sept.	1–14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No Date.		Blyth, Northumberland—School & Caretaker's House	——	H. T. Rutherford, Clerk, Blyth.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	9	6		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	0	0	5	10	0
Sainfoin mixture	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	8	7	1	9	2
Colza Oil, English	do.	1	7	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	11	0		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	10	9		—	
Petroleum, American	per gal.	0	0	6⅝		—	
Do. Russian	do.	0	0	6	0	0	6⅛
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	4	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	8	6		—	
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	6	3	1	6	6

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	80	0	0		—	
Iron, Staffs., bar	do.	6	15	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	15	0	12	0	0
Lead, pig, Spanish	do.	11	7	6		—	
Do. do. English common brands	do.	12	3	9	12	6	3
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	6	10	0	7	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	110	5	0	110	15	0
Do. English ingots	do.	113	10	0	114	10	0
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	0	0	17	5	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0

TIMBER—*cont.*

		£	s.	d.	£	s.	d.
Pine Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	9	10	0	10	15	0
Do. do. 4th & 3rd	do.	8	10	0	10	15	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	18	10	0	20	0	0
Do. do. 2nd "	do.	15	10	0		—	
Do. do. unsorted	do.	10	5	0		—	
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	8	0	0	10	15	0
Do. White Sea	do.	8	5	0	13	15	0
Do. Quebec Pine, 1st	do.	13	15	0		—	
Do. do. 2nd	do.	11	5	0		—	
Do. do. 3rd &c.	do.	9	15	0		—	
Do. Canadian Spruce, 1st	do.	17	0	0		—	
Do. do. 3rd & 2nd	do.	8	0	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	6	0	0	12	5	0
Flooring Boards, 1in. prepared, 1st	per square	0	10	3		—	
Do. 2nd	do.	0	9	3		—	
Do. 3rd &c.	do.	0	7	3		—	

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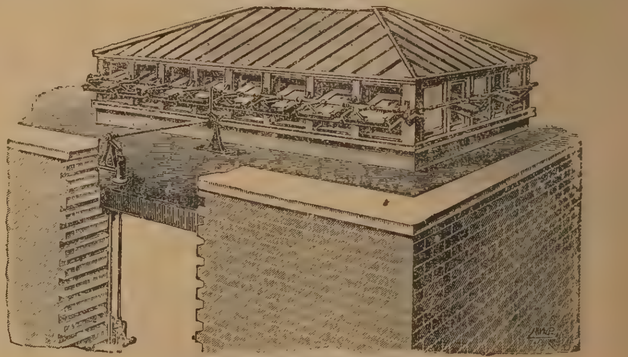

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRENTWOOD (ESSEX).—For making and sewering of about 1,075 feet of road from Ongar Road to Doddinghurst Road, Brentwood. Mr. E. Millard, surveyor, 1 Finsbury Circus, E.C.:—

Doulton's Patent Pipes.

G. Wilson, Walthamstow	£1,698	0	0
C. W. Killingback, Camden Town	1,481	0	0
H. Bentham, Streatham	1,399	0	0
G. R. Mann, Edgware	1,312	10	0
J. Burrill, Manor Park	1,250	0	0
J. Jackson, Forest Gate	1,250	0	0
W. Manders, Leyton	1,246	0	0
W. Langridge, Croydon	1,199	0	0
T. Wilkinson, Upminster	1,150	0	0
Wilson, Border & Co.,* Ilford	1,040	12	6

Doulton's Country Pipes.

G. Wilson	£1,628	0	0
C. W. Killingback	1,434	0	0
H. Bentham	1,364	0	0
J. Burrill	1,215	0	0
J. Jackson	1,195	0	0
W. Langridge	1,162	0	0
G. R. Mann	1,153	9	6
T. Wilkinson	1,075	0	0
T. Watson, Southall	994	0	0

Albion Clay Pipe with Patent Joints

H. Bentham	£1,383	0	0
G. Hayward, Grays	1,247	0	0
G. R. Mann	1,247	0	0
J. Burrill	1,225	0	0
W. Manders	1,214	0	0
J. Jackson	1,197	0	0
W. Langridge	1,162	0	0
T. Wilkinson	1,100	0	0
T. Watson	1,022	0	0
Wilson, Border & Co.	1,021	18	10

G. Hayward, Doulton's patent pipe 1s. 3d. per yard extra on price of Albion clay pipe with patent joints.

* Accepted.

COLCHESTER.—For the erection of a new laundry at Lexden and Winstree Union Workhouse. Mr. G. H. Page, architect, Trinity Chambers, Colchester:—

Ambrose & Ambrose	£847	6
Ernest West, Chelmsford	847	0
Grimwood & Sons, Sudbury	807	0
T. Ward	800	0
W. Chambers	795	0
J. McKay, Clacton	772	0
Dupont & Co.	745	0
R. Beaumont,* Lexden	727	0

* Accepted. [Rest of Colchester.]

DEVONPORT.—For alterations to "The Forester's Arms," Duke Street, for Mr. C. Jessep. Mr. Edgar M. Leest, architect, Devonport:—

A. Truscott	£198	7	5
J. Healy & Son	192	0	0
T. May	188	0	0
T. Jenkin & Son	187	0	0
G. H. Smith & Son	172	15	0
W. J. Oliver*	158	12	6

* Accepted.

DOVERCOURT (ESSEX).—For the erection of new shops, offices, and stores, for the Harwich and Dover Co-operative Society, in High Street, Dovercourt. Mr. H. H. Packer, F.I.A.S., architect, Dovercourt:—

F. Bennet, Ipswich	£5,099
Marchant & Hirst, London	4,525
E. West, Chelmsford	3,985
E. Saunders, Dovercourt	3,985
Smith & Beaumont,* Harwich	3,800

* Accepted. [Architect's estimate, £3,787.]

EAST HAM.—For extension of tramways for the East Ham Urban District Council:—

W. Griffiths & Co.	£6,254	9	6
G. Wimpey & Co.	5,955	0	0
Dick, Kerr & Co.	5,793	7	6

[Engineer's estimate, £6,700. Tenders referred to Works Committee.]

HALLATON (near UPPINGHAM).—For the construction of new sewerage and sewage-disposal works in Hallaton village, for the Hallaton Rural District Council. Messrs. Coales & Johnson, engineers, Bank Chambers, Market Harborough:—

Young, Rugby	£1,810	5	11
J. C. Lucas, East Leake	1,699	18	10
S. Hipwell, Wisbech	1,664	0	0
A. Jewell, Little Bowden, Market Harborough	1,658	12	0
Bower Bros., West Bridgford, Notts	1,390	19	0
H. Butteriss, Hallaton	1,334	0	0
Tate & Eastwood, Market Harborough	1,273	10	6
T. Hickman, Market Harborough	1,252	5	6
A. Wright,* Dunethorpe, near Wansford	1,098	6	1

* Accepted.

HARROW.—For the erection and completion of offices, residential flats, and shop premises in the Peterborough Road, Harrow-on-the-Hill, Middlesex. Messrs. Clarke & Charles, architects. Quantities by Mr. H. H. Robinson:—

Hastings & Ladley	£5,542
T. Turner, Ltd.	4,747
Kimberley	4,695
Miskin & Sons	4,632
Waterman	4,167
Gough & Co.	4,092
Chinchen & Co.,* Kensal Green	3,974
C. Simmons	3,897

* Accepted.

HULL.—Accepted for painting Sculcoates Bridge, for the Corporation:—

Monaghan & Co.	£30

LLANDUDNO.—For the supply of 15-in. cast-iron pipes, bends, valves, &c., and for the laying of same from Llandudno Junction, in the county of Carnarvon, to Croesau, in the county of Denbigh (distance from point to point about 3 miles 4 furlongs), for the Llandudno Urban District Council. Mr. E. P. Stephenson, engineer and surveyor:—

A. Wills & Sons, Bath	£15,476	0	0
G. Taylor, Southport	12,250	0	0
Hughes & Lancaster, Albany Buildings, Victoria Street, Westminster	11,085	2	9
W. Jowett	10,988	8	8
H. Roberts, Hoarwithy, Ross	10,550	0	0
Rowell & Son,* Chipping Norton	10,219	9	6

* Accepted.

LLANFAIRFECHAN (WALES).—For business premises and residence at Llanfairfechan, North Wales, for Mr. W. Eames. Mr. Richard Davies, architect, Bangor:—

W. Jones, Bangor	£1,427	0
R. & J. Williams, Bangor	1,379	0
E. Jones, Llanfairfechan	1,208	12
E. Humphreys,* Llanfairfechan	1,200	0

* Accepted.

LUTON.—For the erection of a fire station, &c., Church Street and St. Mary's Road, for the Town Council. Mr. A. J. L. Evans, borough surveyor:—

T. Smart	£1,893
T. & E. Neville	1,797
W. G. Dunham,* Luton	1,767

* Accepted.

PAKEFIELD (LOWESTOFT).—For carrying out the necessary work and providing the material required in the provision of a sewerage system for the parish of Pakefield, adjoining the borough of Lowestoft, for the Mutford and Lothingland Rural District Council:—

J. Jackson, Plaistow	£4,170	17	9
B. Cooke & Co., London	4,016	0	0
F. J. T. Binns, Croydon	3,965	7	10
A. & A. Streeter, Godalming	3,398	0	0
G. Double, Ipswich	3,392	4	10
Cutler, Haywood & Co., Lowestoft	2,903	0	0
Burgoyne & Son,* Ipswich	2,650	12	4

* Accepted.

STANFORD-LE-HOPE (ESSEX).—For laying about 5,000 lineal yards pipe sewers, and for building manholes, lampholes, and ventilating shafts, &c. connected therewith; for erecting engine house, screening chamber, and pump well; for laying a cast-iron rising main; for building settling tank and bacteria beds; and for preparing about 3 acres of land for irrigation, for the Orsett Rural District Council. Mr. R. F. Grantham, M.I.C.E., engineer, 23 Northumberland Avenue, London, W.C.:—

Lowe's Patent Sanitary Pipe Joint Syndicate, Ltd., New Broad Street	£9,168
Meston & Hale, Harlesden	8,937
J. Jackson, Plaistow	8,422
J. & T. Binns, Croydon	8,422
W. Coker, Rochester	8,258
C. W. Killingback & Co., Camden Town	8,038
T. Adams, Wood Green	8,020
G. G. Rayner, Potter's Bar	7,724
Dowell & Co., Axbridge	7,647
E. Rogers & Co., Kensington	7,540
B. Cooke & Co., Westminster	7,076
W. Manders, Leyton	6,960
G. Osenton, Westerham	6,852
J. Shelbourne & Co., Fenchurch Street	6,724
A. T. Catley, Lloyd Square, W.C.	6,678
A. & A. Streeter, Godalming	6,136
J. Jackson,* Forest Gate	5,691
Wilson, Border & Co., Ilford	5,197

* Accepted.

WOOLWICH.—For rebuilding portion of Messrs. White, Palmer & Co.'s premises, River Bank, Woolwich. Mr. John Rowland, M.S.A., architect, Old Charlton, Kent. Quantities supplied:—

G. Munday & Sons	£1,283
Balaam Bros.	1,210
Kirk & Randall	1,033
H. L. Holloway	1,027
S. J. Jerrard & Son	£989
Thomas & Edge	967
H. Sanford & Co.*	842

* Accepted.

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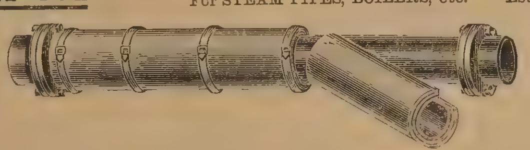

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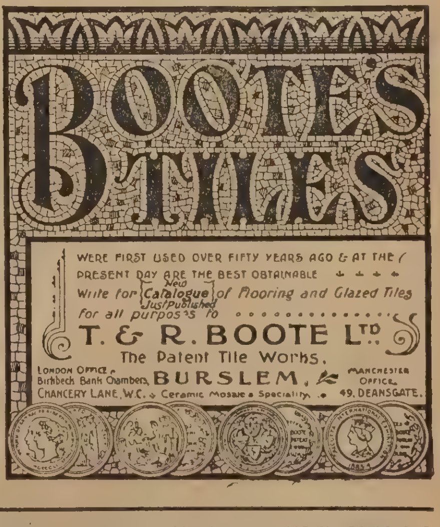

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Registered to carry on the business of shop-front builders, shop-front fitters, shop builders and fitters, manufacturers, suppliers, lenders, hirers, fitters and builders of and dealers in showcases, furniture, fittings, &c., in connection with shops, stores, offices, museums, &c.; carpenters, joiners, upholsterers, painters, decorators, general builders, &c. Capital £150,000 in £5 shares (9,000 ordinary, 20,000 five per cent. cumulative preference and 1,000 "family annuity"). The first directors are Frederick G. Sage (chairman), Frederick Hawes, Josiah Hawes and Jesse Hawes. Registered office: 60, Gray's Inn Road, W.C.

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Registered to carry on business as dealers in artists' colours and materials of every description, pictures, prints, picture frames and fancy articles. Capital £2,000 in £1 shares. First director, A. F. Oliver.

COMING EVENTS.

Wednesday, October 9.

Sanitary Institute.—Council Meeting at 5 p.m.

Institute of Sanitary Engineers.—Meetings of Examination and Literary Committee at 3 p.m., and of General Purposes and Finance Committee at 4 p.m.

Thursday, October 10.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Ventilating, Warming and Lighting," 7 p.m.

Carpenters' Company, Carpenters' Hall, London Wall, E.C. (Lectures on Sanitary Building Construction).—Mr. Keith Downes Young, F.R.I.B.A., on "Building in its Relation to Health," 7.30 p.m.

Friday, October 11.

Architectural Association.—Annual General Meeting. Presidential Address and Annual Distribution of Prizes by Mr. W. Howard Seth-Smith, F.R.I.B.A., 7.30 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Calculations, Measurements, and Plans and Sections," 7 p.m.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.—Opening Address by the President, Mr. James M'Kissack.

Saturday, October 12.

Northern Architectural Association.—Visit to Newcastle Breweries Premises, Haymarket, and Electric Power Station, Newcastle, 3 p.m.

North of England Institute of Mining and Mechanical Engineers (Newcastle-upon-Tyne).—Council Meeting at 1.30 p.m., General Meeting at 2 p.m.

Tuesday, October 15.

Glasgow Institute of Architects.—Annual General Meeting at 2 p.m.

Wednesday, October 16.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. W. Spinks, A.M.I.C.E., on "Sanitary Appliance," 7 p.m.

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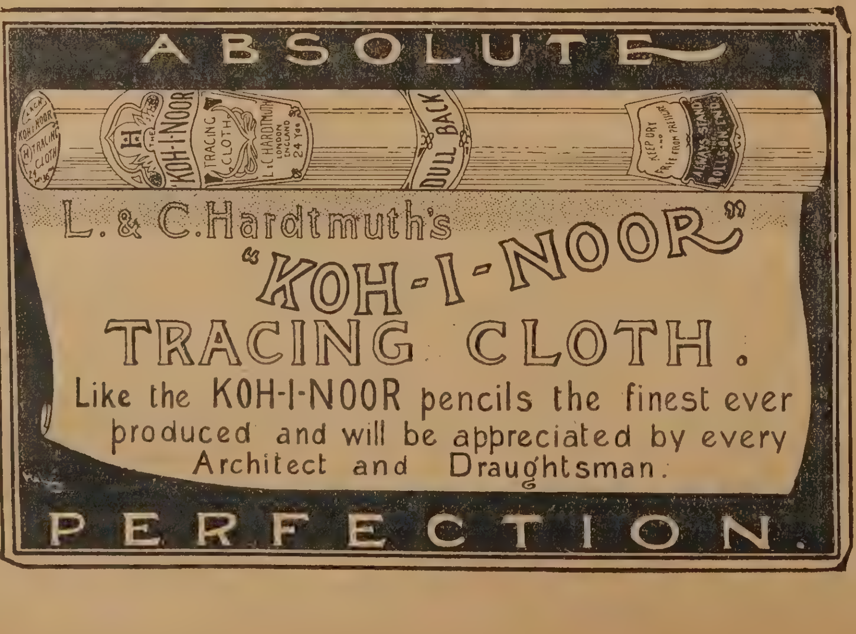

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No. 349.

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An Architectural Causerie.

The late Mr. Brooks. THE late Mr. James Brooks, whose death we were able to briefly announce in our last issue, was one of the most hard-working as he was one of the best of our modern church architects. His energy was indefatigable, and his whole philosophy is summed up in the aphorism which will be found at the head of another page. It was work—and good work—that raised him to the high position he occupied. Church architecture in this country to-day, though the Gothic flame is long since quenched, is far more satisfactory than many other branches of the art—shop premises, for example; and while designs of a very distinctive character are seldom seen, the average merit of the churches built is pleasingly high. This is no doubt a legacy of the Revival, but it is also due to the fact that there are several church architects of distinction yet amongst us whose work exerts a leavening influence. Such work is that of the late Mr. Brooks. We cannot look, for example, at his last large church—that of the Holy Innocents at Hammersmith—without feeling the strong character of the man who created the design; and nothing is perhaps more noticeable than the proportion observed between wall-space and abutment, solid and void. It is the excellent proportion which gives character to this architect's work. The same applies to the many other large churches which he built in London: St. Michael's, Shoreditch; St. Mary's, Haggerston; St. Columba's, St. Chad's and St. Saviour's, Hoxton; St. John the Baptist's, Kensington; or the beautiful Church of the Annunciation at Chiselhurst. Mr. Brooks's death leaves a great gap in the ranks of church architects, but we would wish that the examples which he has left us may infuse in others the spirit of thoroughness and attention to detail which resulted in such excellent buildings as those mentioned. It is perhaps not generally known that in those early days when Mr. Brooks practised farming in his native village—Hatford, Berkshire—he invented a threshing machine and a new "breast" for the plough-share, both of which were commercially successful; in fact the latter is practically the "breast" of to-day. It has been wisely said that it is the inventive faculty which differentiates between genius and mediocrity, and the freshness in treatment which characterises all the churches designed by the late Mr. Brooks is in no small measure due to his possession of this faculty. As he himself asked at a meeting of the Institute in 1895, when the Royal Gold Medal was presented to him, without the gift of invention how could a man become an architect? But even if this were his natural gift, it could not be fruitful without systematic training and study, and Mr. Brooks was a zealous supporter of students receiving such a training and not allowed to learn their calling in the "tumble-up-way" which he himself experienced. Another interesting fact concerning Mr. Brooks is afforded by his great dislike for subordinates to do his work. He employed no assistant in his heyday, even when engaged concurrently on six sets of church drawings, an example which should prove very inspiring to some of the laggards found in modern offices. Though Mr. Brooks's fame rested mainly on ecclesiastical designs, these were by no means his only achievements, for he built (among others) a large brewery, an hotel, many secular buildings, two hospitals in connection with Sisterhoods, extensive stables for the Marquis of Londonderry, labourers' cottages and gentlemen's mansions—a range catholic enough. An illustrated biographical article on Mr. Brooks, who was born in 1825, appeared in our issue for April 2nd, 1895. We learn that the style of the firm will remain unchanged—Messrs. James Brooks, Son & Godsell.

THE LATE MR. JAMES BROOKS, F.R.I.B.A.

Some Addresses. OUR space is crowded this week with reports of the opening meetings of architectural societies. Inaugural addresses, unfortunately, often form very dry reading, but those which we print this week certainly do not come under such a head, and we consider the occasion opportune therefore to point out that no good comes out of long discourses which bore to death everyone whose misfortune it is to sit them out. A much more useful purpose would be served if, like Professor Simpson at Liverpool, Mr. Seth-Smith in London, or Mr. Darbyshire at Manchester, presidents confined their remarks to certain specific subjects of topical interest, to which they are thus able to devote profitable attention, rather than to weary their hearers in the manner so eminently characteristic of the æsthetic young curate preaching on the virtues of Saint Paul.

"Squash" Courts. "SQUASH" courts are not places for the preparation of beverages in large quantities, neither are they intended to be used for the systematic compression of human beings; they are enclosed spaces in which the game of "squash" can be played, a game of *long* tennis. Such courts measure 100ft. by 36ft., but despite this fact wealthy New-Yorkers are providing them at their private residences at a minimum cost of £5,000. The "squash" court is rectangular, and has an inner wall 7ft. high running around three of its sides. A sloping roof (the "penthouse") stretches from wall to wall. From one point in the main wall a tambour projects to deflect the ball across the court, and in the inner wall below the penthouse there are several openings. These courts provide a good deal of work for architects, as the buildings which surround them are somewhat extensive; but such buildings are, naturally, not required when the court is formed on the roofs of other structures, as now proposed in New York.

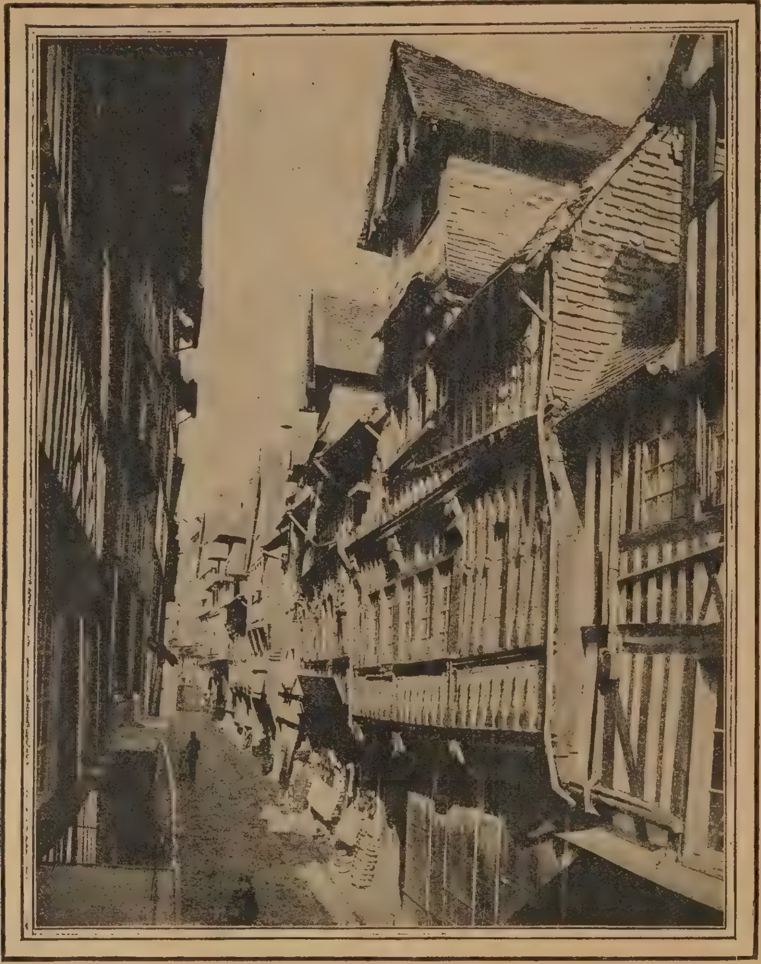

FIG. 9.—SIXTEENTH-CENTURY HOUSES, RUE AUX FEVES, LISIEUX.

WOODEN HOUSES IN FRANCE.—II.

By JEAN SCHOPFER.

(Concluded from p. 123 of No. 347.)

THE succeeding illustrations (Figs. 9, 10 and 11) present a picturesque aspect of the streets of the Middle Ages. The first one shows some old houses in the Rue aux Fèves at Lisieux, in Normandy. They belong to the sixteenth century, but were it not for certain carved details they might just as well be a couple of hundred years older. We see clearly the idea the builder had of corbelling. In wood construction it is done in the simplest manner. The beams of each floor extend from 1ft. 6in. to 3ft. beyond the line of the storey below. On these ends is placed the sablière beam of the next storey. The whole is strengthened by brackets which support the ends of the beams. Corbelling was the rule in the Middle Ages. Generally there are two storeys, the upper one overhanging the ground floor to the extent of several feet. Doubtless this shut off a good deal of air from the lower part of the houses, but it was necessary to make the most of the available space, and in town houses the living rooms were always above, so that it was only the shop, which occupied the ground floor, that suffered from lack of light and air. From a picturesque point of view the old street with its pointed gables, its large dormer windows, its successive corbellings, the door and window carvings, and, above all, the individual appearance of each house, with a style and decoration of its own, evidently presented a picture far more cheerful, varied and artistic than the modern street offers with its lines of utilitarian barracks. In the Middle Ages the house was a thing which a man constructed not only for himself, but to be handed down to his descendants. For this reason it was ornamented and given a stamp of its own, for it was built for a particular family having its own style of life, its own traditions, and desiring a dwelling-place in harmony with its tastes. It will be remarked that there are also at Lisieux some specimens of the *pan de bois* of which we have spoken before. The following houses are at Beauvais and Bayeux. The brackets supporting the corbels afforded an excellent opportunity for carved decoration, and the clever *ymaigiers* of the fifteenth and sixteenth centuries profited thereby, as we shall see in detail. But before coming to the more elaborately ornamented houses let us look at a few simple types of large houses.

At Lisieux there is a house with two gables on the street. The way in which the attics are sheltered is interesting. It has been much imitated latterly for country houses, especially in this country. In this house we see the variety of effect proper to wooden edifices. The employment of crossings of different kinds of wood is in itself a decoration. The Norman roofs are always tall and picturesque.

Here again we must lay stress on that peculiarity of wood construction shown in the Swiss châlets, and which consists in taking advantage of the necessary and organic elements of the construction, and, instead of trying to hide them, endeavouring to turn them to account and make them express a decorative theme. What was true of the châlets is equally true with regard to the French houses of the Middle Ages. The big sablière beams, the brackets, and the external and visible arrangement of the framework are at the same time a decoration, not accidental but intentional; not haphazard but desired and aimed at.

At Rennes (Fig. 12) there is a house of very different aspect. Note the curious manner in which the corbels are executed and the place occupied by the carvings on either side of the door.

In the next house (Fig. 13), which is to be seen at Bourges, we meet with another spirit and other aims. It is called "La Maison de la Reine Blanche." The timberwork is reduced to a minimum; only the main lines are visible, the panels being filled in with brickwork. But what rules supreme here is the carved decoration, and

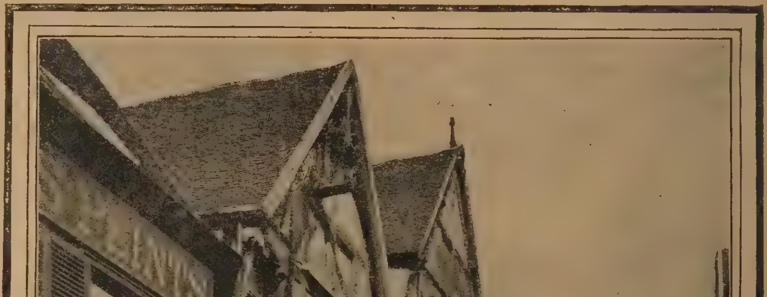

FIG. 11.—RUE DE LA MANUFACTURE, BEAUVAIS.

being the first really complete example we have it is worth while to pause and to look into it.

In Switzerland the châlets receive a very rich carved decoration; but it is pure ornamentation, not statuary. It consists of friezes with series of small arcades, and of diamond moulding, awaking in the mind recollections of Romanic decoration, of which the art of the châlets is but a survival. We have remarked how interesting is this tradition, which is seen flourishing again on the Swiss châlets so many centuries after its disappearance from Europe. In France the wooden houses slipped away from the Romanic tradition. Construction in wood was only recommended, as we have seen, at the end of the thirteenth century, when Gothic art had already reached the plenitude of its means and forms. The art of working in wood seems to have remained a stranger to the expansion of thirteenth-century art, and even during the following century it furnished no contribution to the artistic work of the century. This is a curious thing, and one which cannot be explained; but it must be noted that while we know certainly that wooden houses were built at the end of the thirteenth century and during the whole of the following one, we have not a single example of wooden houses with thirteenth- or fourteenth-century carvings on them. We must come to the fifteenth century to find, in the kind of construction we are dealing with, a current of art similar to that which manifested itself in stone construction. The only houses with carvings are fifteenth- and sixteenth-century edifices; and we must add that statuary then occupied a far more prominent place than ornamentation.

It is seen here without difficulty that one is in a place where the representation of the human face and body is a thing that has been done for a long time past, where the faculty is possessed of expressing in the plastic art the sentiments and passions, and where, too, it was known how to unite carved decoration to the architectural conception.

In the "Maison de la Reine Blanche," for instance, where it is found quite natural to figure on the ground-floor pillars scenes from sacred history, such as Christ in the Garden of Olives; there, a kneeling woman playing a viol and wearing the ample robe with heavy folds of which Burgundian sculpture had at the beginning of the century produced unforgettable models! Above, there are consoles, supporting heads; here, the large face of a monk; there, a woman's face, wearing a hood. On the brackets of the roof there is the same series of grotesque heads, many of the types of which are to be seen on the stalls of cathedral choirs. Thus, this house, although not a palace nor a grand abode, furnishes a contribution to the statuary treasures of its period.

At Luynes (Indre-et-Loire) there is, on the square of the town, a high-roofed house which has some fine carvings on the big beams of its ground floor (Fig. 14). On one of the door posts there is a long-robed Virgin, and on the other a Virgin with the body of Christ on her knees; at the end, on the same side, a Saint Christopher crossing the Waters, and on the other a bearded individual of majestic mien, perhaps a wise man of the East. This splendid series of carvings now ornaments a butcher's store. To us this is not at all displeasing. This art was not a mandarin's art; it was intended to be understood and loved by all, and it is in its right place near the lowly and those who toil. More than one such house could be found in France, although many images taken from Holy Writ were destroyed during the religious wars, during which the Protestants acted with the greatest barbarity whenever they came across scenes dear to Catholic iconography. Besides, a great number of these figures were removed, and very few of them have found their way into the museums.

At Levroux there is a corner house with some curious grotesque figures carved on the capitals (Fig. 15).

The next four houses are interesting in several ways. They carry us towards the sixteenth century. The spirit of the Renaissance shows itself in them, at first in the ornamentation, as is always the case, and afterwards in the construction; and then it is the decay, and speedily the ruin, of the woodworking art.

The house at Abbeville (Fig. 16) named after François Premier is faithful to the old-fashioned style of construction. It marks the end of a Gothic epoch; statuary mingles with the ornamentation, which is still Gothic. Above the door one sees a Virgin holding the Child Jesus.

The presbytery at Treport is a house in which brick and stone combine with wood in the happiest manner possible. Upon a ground floor in masonry there is an overhanging *pan de bois* with heads in medallions ornamenting the beam ends (Fig. 17). The decorative effect obtained by the crossing of the timbers and the filling-in of bricks in two colours is charming.

A large house at Saint-Valery-en-Caux shows us a fine arrangement of timberwork, and gives another example of the old habits of construction. The new spirit is manifested in the large ornamental friezes running in three lines along the front. It is the antique ornamentation—masks and garlands; balusters above the doors. The carvings are much dilapidated, but enough is left to fix the date of the work. (Fig. 18.)

At Rennes we have a very pretty entrance of a house dating from the same period. The crossings, the decoration and the admirable proportion of the parts make it an example of excellent style, and we think it will be examined with interest. (Fig. 19.)

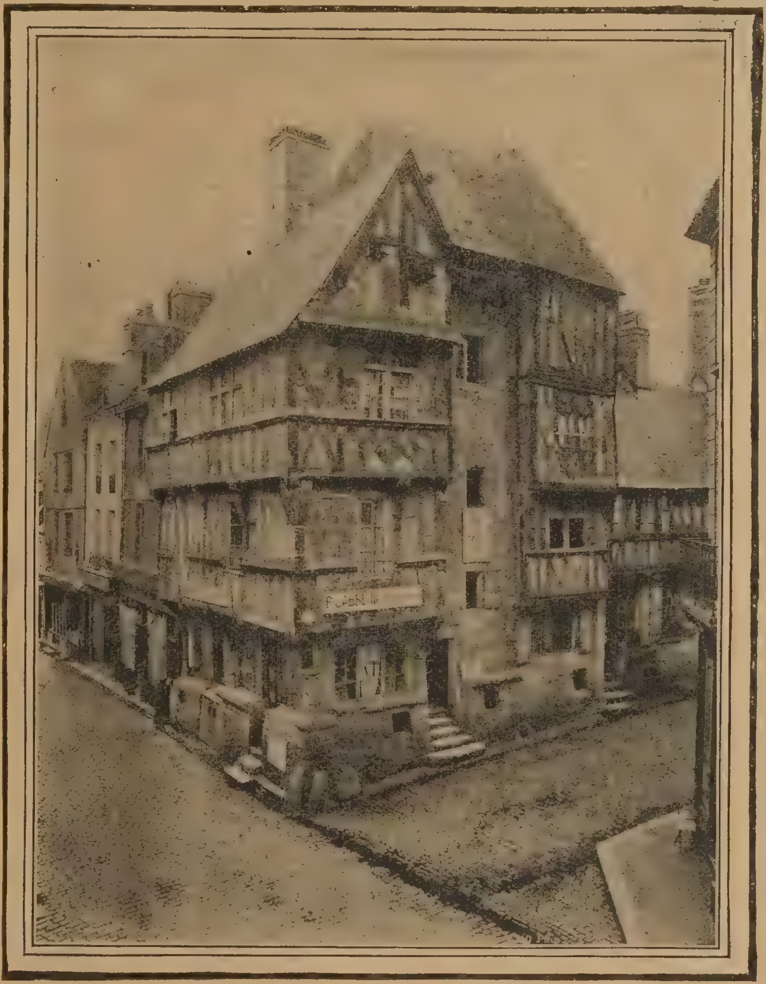

Fig. 10.—House in Palis (Aube).

The house illustrated in Fig. 20 is situated at Roye (Somme), and is also a typical specimen of the class we are now studying. In general appearance it belongs to the Middle Ages. The shape of its roof and its bays of joists, which strive to appear ingeniously combined but are in reality heavy and awkward, might date the end of the fifteenth century; whereas the carvings on its brackets and the decorative spirit of the façade place it in the middle of the sixteenth. Note the heads, the foliage and the brackets covered with all the cast-off clothing of Roman antiquity, which surely has no business on this Middle Age carpentry.

We now reach the completion of the system whose first types we have here pointed out. Standing before the Renaissance house at Rouen shown in Fig. 21, we feel we have changed country. Assuredly, if we wished to consider merely the manual dexterity of the sculptor who has carved this front as one would carve a chest or a coffer, there would be ground for admiration, and we would be ungrudging in our praises. The work is rich and of remarkable finish. Every part is covered with the most elaborate ornamentation. On the brackets are little genii, who come from afar and speak a foreign tongue; the wide plain borders, the false galleries on the several storeys (for the pilasters certainly suggest a gallery), the masks on the brackets, and, lastly, the medallions on the upper storey—everything combines to denote a common origin, not French, but antique. It is an adaptation, not an original. But what is more important is that it is not an adaptation of a style of working in wood, but a transposition from one material into another. This system of decoration belongs properly to the art of working in stone; it is in stone that it was created and developed, and one cannot understand it otherwise. In wood it is void of signification. The deep-rooted reasons for the art values of the Swiss châlets are that the construction is real, not transposed; that it is based on the qualities of the substance; and that it has logically followed the rules of construction imposed by the choice of this material. French house-construction of the Middle Ages, with other needs to satisfy and other kinds of timber at its command (oak, not fir), has obeyed the same logical principles. It was timberwork, and timberwork it has remained, and it has managed to extract from its theme of construction charming decorative effects fully in harmony with this theme. Wooden house-building, as understood at that period, had a long and not unlovely existence. But the Renaissance came. The Renaissance has often been described as a setting free of minds, but it would seem that those who so judged it did not know the Middle

Ages and could not trace the results of Humanism. There was more liberty for art in what are called the Dark Ages than in the French seventeenth century. We know people who prefer Rheims, Paris or Amiens to Versailles or the Jesuit churches. These truths, suspected fifty years ago by a few, are now making their way in the world. One is able to hold these ideas without calling down the scorn of those who talk of art.

In the domain we are dealing with "Antiquity established and demonstrated," as the erudite seventeenth-century humorist said, had the effect of ruining the beautiful and savory forms in which still breathed the life of the nation's past. It subjected Europe to the uniformity of its rule. No more personal interpretation, no more racial sentiment. The antique canons were law.

The French sixteenth century defended itself well. It was robust enough to swallow the foreign food and assimilate it to its temperament The admirable series of castles of the Loire are thoroughly French, notwithstanding the ornamentation and the evident plagiarisms. But it is the end, and that for a long time to come.

Wooden-house construction was also condemned. Antiquity declared that the only art worthy of the name was that of stone, and stone began its reign of absolutism. Wood when by chance it was employed endeavoured, in order to exalt itself, to imitate stone, as, for instance, in that house at Rouen which we have before us. Such complete forgetfulness of its origin and *raison d'être* proclaims the end of the art, for it is evident that stone is far superior to timber for this kind of construction and this system of decoration. Wood is not strong enough to struggle here, not being on its own ground. It has nothing to do but disappear. The Rouen house may create an illusion by its carved chest appearance. But look at a *pan de bois* of the seventeenth century—that, for instance, of the house, shown in Fig. 22, situated at Bar-sur-Seine, in the Aube. There the absurdity is glaring. These fluted pilasters, those composite capitals, those heavy brackets, the ovolos and the palm leaves, the window supports, and, mingled with the whole, a *pan de bois* regularly and wisely arranged—all this makes up an architectural monstrosity, and we feel that we ought to apologise for putting it before our readers.

The *pan de bois* as understood in the Middle Ages is of no use now for urban constructions. It has, however, a fairly wide field in rustic architecture. Combined with brickwork it is still employed with success, and we believe that architects can find in the types here submitted more than one interesting motive, more than one ingenious arrangement which deserves to be revived. As has been seen, the effect of a fine *pan de bois* is picturesque, and owing to the variety of combinations it allows it is capable of rendering good service in the hands of a skilful architect. In any case, the ever-powerful charm of these old houses and the knowledge of their approaching end are in themselves adequate reasons to justify this backward glance into the past.

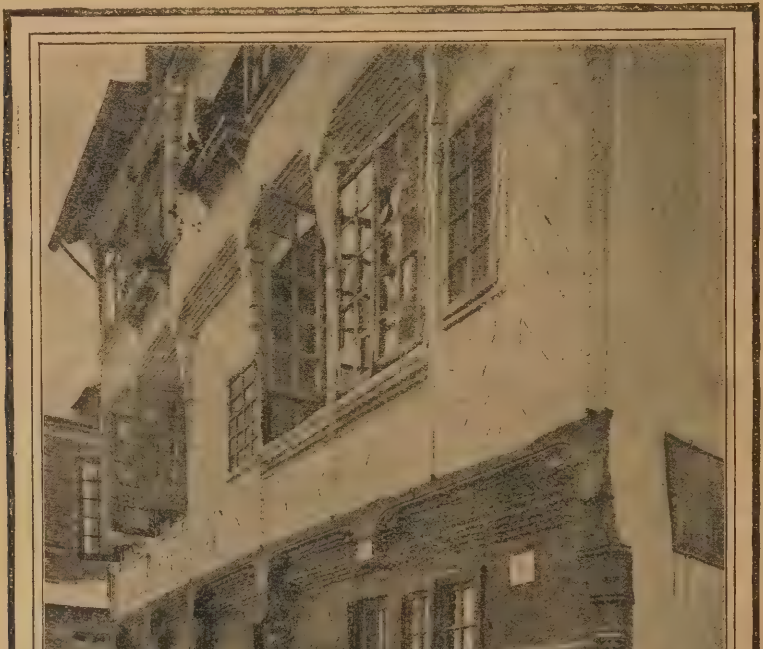

FIG. 12.—WOODEN HOUSE AT RENNES.

LIVERPOOL ARCHITECTURAL SOCIETY.

PRESIDENTIAL ADDRESS BY PROFESSOR F. M. SIMPSON.*

> "*And the Committee decided that the style of the new cathedral should be Gothic.*"

LAST year I read you a somewhat fanciful account of the progress of architecture during the last century, and referred to the see-saw of styles which then prevailed. To-night I take as my text the sentence from a newspaper cutting which I have just read. But before commencing my homily I wish to draw attention to the fact that this is the first meeting which has been held since the incorporation of the Society. I wish to congratulate the members on this achievement, and to express the hope, in which I am sure you will all join, that the incorporation may prove of lasting benefit and give additional strength to the Society. We have not been hasty in taking this step; we are not a young society; we have already celebrated our jubilee; and other societies, more recently formed, have been incorporated before us. If there has been delay on our part, that reproach is now removed; and under our new title we may, I trust, hope for many years of prosperity and many sessions in the future even more successful than those we have had in the past.

The history of the Gothic revival in England is an extremely interesting one, and one that it is now possible to write as it has long since past its zenith. One can therefore review its aims and ideals, and judge with some degree of certainty to what extent it succeeded and in what respects it failed. It stands out as the most remarkable feature in the architectural work of the last century. Last year I dealt with some of the causes which led to it, but a little repetition may perhaps be excused.

Starting more than one hundred years ago, the movement was at first a romantic one and coincided with a similar movement in literature. Later on it became an ecclesiastical movement; later still, an architectural. The chief forces behind it were the growing admiration for the masterpieces of mediæval art, a strong feeling of indignation at their neglected state, and a keen desire to remove this reproach and place the buildings once more in a suitable condition for ritual worship.

The desire for restoration was, therefore, the most powerful factor in causing the revival. Architects were obliged to carefully study these fine old monuments in order to obtain the knowledge required to properly carry out the necessary renovations. This study bred a great love of the style in many, and men became saturated with Gothic detail and learned in its intricacies. The knowledge they acquired for the restoration of old buildings they soon devoted to the building of new. Gothic became the ecclesiastical style. The churches immediately previous to the revival possessed no architectural distinction; and a renaissance of the style which had governed all church-work since the Reformation was rendered impossible by the fact that those who still preferred the Classic style to the Gothic had unfortunately fallen under the sway of Greek art, and could see no beauty in any form of building except a Greek temple. The Gothic fervour spread throughout England; the Continent, it must be remembered, was then hardly affected by it, and to this day the movement has never had a tithe of the force there that it formerly possessed here.

From the first the Gothic revivalists were confronted by the enormous differences which existed between the conditions under which they had to work and those which prevailed in the days when the originals they desired to follow were erected. All through the Middle Ages—in fact, in all times until the end of the last century, except during the short period when the momentous change between the Gothic and the Renaissance was effected—only one style was recognised by the workers of the day: the style in which all worked and from which no man dreamt of departing. Advance they desired and accomplished, but advance was always on the lines they knew and understood. All men were in sympathy one with another; not only the workers, but the patrons and employers also. No committee would have thought then of asking for a Greek or a Roman design, and they certainly would not have got it if they had asked. I do not propose to enter into the vexed question as to the standing of the architect in the Middle Ages. Personally, I do not hold the extreme view that he had no existence; but there is no doubt that the chief-designer, whoever he was—architect, bishop, monk or lay master-builder—occupied a somewhat different position from that of the architect to-day. The Gothic was the democratic style; whether democratic entirely or in part only is immaterial. The workmen had a much greater say in the development of a design than has been possible since. Mouldings and carvings were left in a great measure, if not entirely, to the men who worked them. Masons travelled about the country, their tools in their hands, their templates in their pockets, ready to repeat the mouldings or carvings they had already executed elsewhere

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* Delivered on October 7th.

Absolute sympathy existed between all workers. To this is owing the rapid development of the style and the perfection it achieved. The Gothic style was not the creation of one man, or even of a few—no one occupies for Gothic the position Brunelleschi occupies for the Renaissance—it was the result of thousands working together harmoniously towards one end and in one spirit.

The revivalists of the last century found themselves attempting to work under very different conditions. They had by careful study mastered the secrets of the style—could tell, within a few years, the date of any moulding or piece of carving; could draw with certainty a section which would not depart one hair's breadth from an ancient example; and were eloquent over the differences which existed between thirteenth- and fourteenth-century carving. But although they were such perfect scholars, they possessed no skill in any of the crafts; they were not masons, neither were they sculptors. This would not have mattered one bit if the masons and sculptors had been equally learned. But at first such was not the case. The sculptors of the day were ignorant of architecture, and thought architectural sculpture beneath their notice; and the ordinary carvers and masons were incapable, if left to themselves, of producing anything which by any stretch of imagination could be called Gothic. These men had to be trained. The great difficulty that Barry, Pugin, and, later, Scott and others experienced was obtaining men who could carry out their ideas. Gradually they succeeded; collections of casts were formed, of which the more important are still to be seen in the Architectural Museum, Westminster, and bands of workmen were brought together capable of infusing mediæval feeling into their work. Something very nearly approaching the conditions of the Middle Ages was beginning to result when the movement began to subside. The demand slackened off, partly because all the cathedrals had been restored, partly because church building activity was not so pronounced as formerly, and partly because of the great increase in non-ecclesiastical buildings, for which the Gothic style was thoroughly unsuited, and which consequently had caused the rise of another phase of architecture altogether. The workmen collected with so much care have died, been scattered, or have transferred their attention to other styles. Of course some remain; so important a movement does not collapse all of a sudden: but in the large workshops there is no longer the enthusiasm for Gothic work which prevailed twenty years ago, and which made the Gothic revival more real than many have supposed. Of the men whose genius carried the revival to its height few survive. Scott, Street, Butterfield, Pearson, Burges, Gilbert Scott the younger, and Sedding, are dead. A few still remain, names we honour and respect; and to these may be added some of the younger men who have remained true to their masters' traditions; but without the slightest exaggeration it may be said that the greater number of architects now practising in England are seeking development in other directions.

It may be thought that I have treated too much of detail, but in the early days of the revival at least it was paramount. The committee say that "the style shall be Gothic." What is Gothic? Unfortunately mediæval detail is still regarded by some, especially by those interested in but not practising architecture, as constituting the Gothic style. But this is the wrong way of looking at it. As I said in an article I wrote the other day, construction, not detail, makes a style. If the Committee are willing to depart from the recognized forms of ornamentation which hitherto have been more or less obligatory, and allow the architect who designs and the other artists who assist a free hand in plan, ordinance and detail, then it is possible that a building can be produced suitable to modern requirements and yet Gothic in the true sense of the word. But if, on the other hand, by Gothic the conventional is meant, if the term is to be narrowed to mean a reminiscence of mediæval buildings—perhaps of only English mediæval buildings—if the plan, mouldings, carvings and accessories are such as will conform to the standard of the amateur, whether ecclesiastial or lay, who takes no interest in living architecture, but who finds satisfaction in examining the work of the past, then there is every danger that the finest opportunity which has occurred since the time of Sir Christopher Wren is going to be thrown away. If the term Gothic is used in its narrow sense, limitations will be placed on architects which workers in no other art would tolerate for a minute; why we should always be the sufferers I fail to understand. We are daily told that other arts are advancing in England and that ours is standing still. I do not believe this for a minute; I believe that the advance in architecture is as great as, if not greater than, that in any other art, but restrictions such as that proposed to be inflicted render advance doubly difficult.

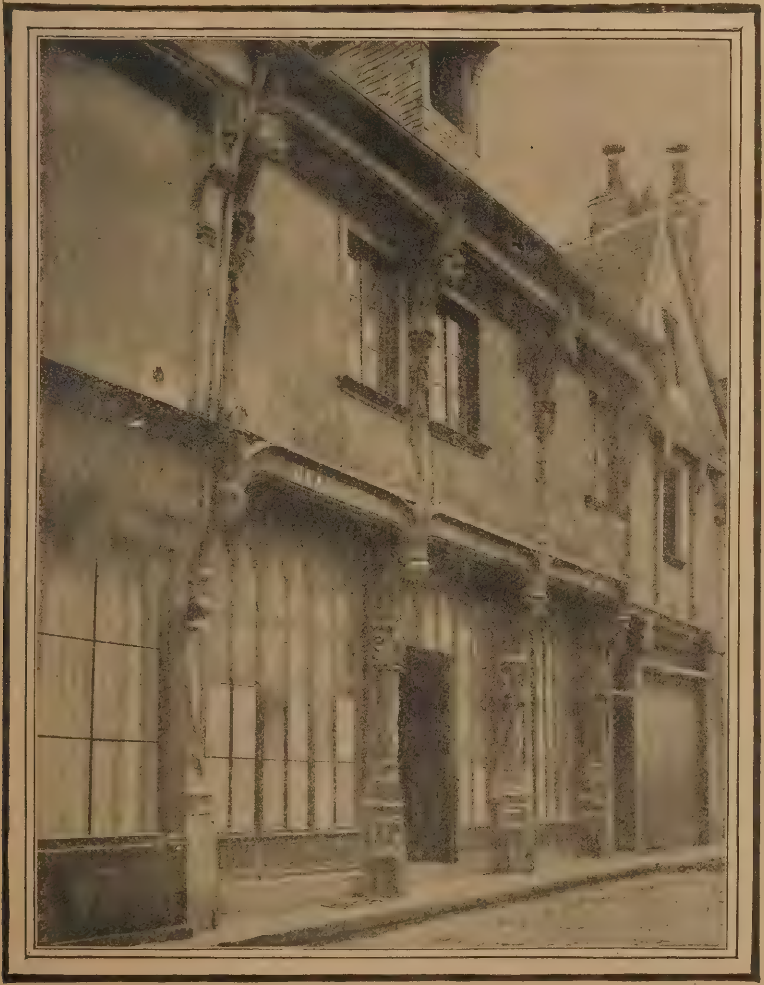

FIG. 13.—MAISON DE LA REINE BLANCHE, BOURGES.

Are painters asked to produce work in the style of Cimabue and Giotto? Are sculptors required to follow the manner of the unknown carvers of the Middle Ages, or the great men of the Renaissance? Are musicians obliged to compose in the style of Handel or Mendelssohn, novelists to write like Fielding or Smollett, or essayists like Addison or Goldsmith? Command a poet to talk in the phraseology of Spenser's Faërie Queene—and hear his language! It is possible we have no artists in any branches whose work can compare with that of Michelangelo, Mendelssohn, Fielding or Addison; but although the work of the modern men may be inferior to that of these giants, it appeals to us more than even the greatest masterpieces because it is the art of the day, because it is the result of individual thought, and because it is only by an infusion of new feeling and new ideas that advance in any art is possible.

The men working now may be, comparatively speaking, failures; if so they fail so that others shall eventually succeed. They are slowly building up a series of monuments which will one day be capped by masterpieces. This is ever the way that art has advanced. The beauty of the Parthenon is not due to Ictinus and Pheidias alone, but to the unremembered men who worked before them. Gothic architecture did not leap to perfection at once; Robert de Coucy, the architect of Reims, and Robert de Luzarches, the architect of Amiens, built those cathedrals on the foundations laid, metaphorically speaking, by their less successful predecessors. If Anthemius of Thralles had been commanded by the Emperior Justician to make the new Santa Sophia in the Greek or in the Roman style the world would have been the poorer by one of its finest buildings. The Emperor had too much good sense; he allowed the architect fairplay and a free hand.

That is all we ask for at the beginning of this new century. If there is ever to be a new departure, now is surely the time. Architecture, more than any other art in existence, suffers from a glorious past. What should be a source of strength to us is converted into a source of weakness.

Nobody admires the old Gothic buildings more than I do. There is not a cathedral in England I have not visited, and most of the best on the Continent I have seen, but that does not make me regard their style as the most suitable one for a modern cathedral.

My objection is not so much to the decision that "the style is to be Gothic" as to the dictation that the style is to be anything at all. The citizens of Liverpool acted otherwise seventy years ago. If Elmes had been told he had to design in the Gothic style we should not have had in St. George's Hall one of the most remarkable modern buildings in the world. I shall be told that that building is different; that it is not ecclesiastical. No more are the Houses of Parliament, built at exactly the same time, and yet that did not prevent the Committee from issuing instructions to architects that the style of the building was to be Elizabethan or Gothic. Have we advanced nothing in seventy years? Is the method observed in London in the first year of Victoria's reign to form a precedent for that to be followed in Liverpool in the first year of Edward VII.'s? There was some excuse then. The tide of the Gothic revival was flowing strongly and men were full of enthusiasm for a new movement. The tide has turned now, the old enthusiasm is dead, and a new movement on totally different lines has taken its place. It is

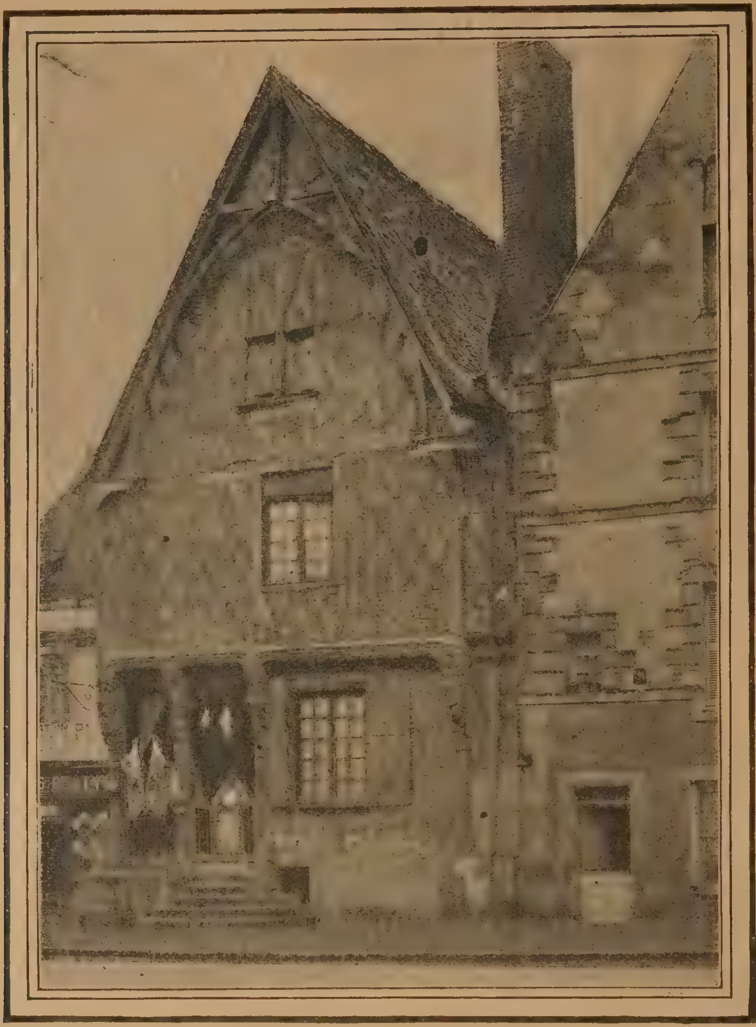

FIG. 14.—WOODEN HOUSE AT LUYNES.

unfair to ignore this fact. Cathedrals are not built every day, another such opportunity may not occur through the century, and the narrowing of the instructions to architects will cut out many men accustomed to deal with big architectural problems whose sympathy with Gothic is but slight, because they regard the style as inappropriate to the requirements of the day and incapable of further development beyond the point reached 400 years ago.

To turn to another point. Against the style dictated there are certain local objections. Liverpool has fine architectural traditions, but they are not Gothic. Its public buildings and many of the fine blocks of city offices erected before the middle of the last century are all Classic. So are the best recent buildings in the town. A Byzantine or Romanesque cathedral would harmonize with those surroundings because both styles are founded on Classic work. Then there is the site; that undoubtedly lends itself more to the squarer Classic or Byzantine than to the longer thinner Gothic. But this I do not wish to dwell upon; I am not protesting so much against the inclusion of Gothic, although personally I regard it as unsuitable, as the exclusion of the other styles. My protest is directed against the interference with the liberty of the designer to express himself in the manner he regards as most suitable. Who can say what the style of a new cathedral ought to be, considering that in no large town in England—except London with its Classic St. Paul's—has one been commenced for over 500 years. Conditions have changed so much since then that the problem for the architect to solve is practically a new one. That the style should be left open was one of the points we emphasised in the meeting which took place between the Cathedral Committee and a deputation from the Council of this Society. The particulars of this meeting may be unknown to some of the members present, and a brief account of it may therefore be of some interest.

The invitation to send a deputation came as a surprise, but was none the less appreciated. I do not suppose that any of us considered it likely that our suggestions would be accepted in full; but it was a considerable disappointment to learn from the daily papers that every suggestion we made had been overruled, and that on every point the decision of the Committee was the direct opposite of that we advised. When our suggestions are known I feel certain that the regret felt by the Council will be shared not only by the members of the Society but by the profession generally, with very few exceptions.

The points we were invited to express our opinion upon were (1) choice of architect by selection, limited competition or open competition; (2) style to be adopted; (3) how to deal with the site. On the last we expressed no opinion at all, and I was therefore somewhat surprised to see in the local papers that we had met the Cathedral Committee for this purpose only. This account of the meeting was calculated to convey a false impression, as suggesting that the deputation—or rather the Council—had changed their mind regarding the suitability of the site chosen; a matter upon which the Society had already very early and almost unanimously expressed an opinion.

To the first question, the choice of an architect, we replied that we did not believe in limited competition, and said that in our opinion two courses were open to the Committee: (1) to appoint without competition a well-known architect, (2) to have an unlimited competition on certain lines which we briefly indicated. Our principal reason for disapproving of a limited competition was that, outside the very few really well-known church architects, it could not be said that there were many who possessed special claims to be regarded as experts in cathedral planning and design. Many men have recently built excellent churches; but because a man can design a good yacht, it does not follow that he can design an ironclad, and a man who can build a decent church may not be capable of dealing with the much bigger problem of a cathedral. If the Committee did not wish to appoint direct a well-known man as architect, we suggested a competition open to all English architects, the competition to be in two parts. The first was to be preliminary; drawings were to be to a scale of $\frac{1}{16}$in. to a foot, no perspectives were to be allowed, no fittings shown, and no more drawings submitted than were absolutely necessary to explain the design. From the first competition we suggested that not fewer than six nor more than ten designs were to be selected for the final, and that the authors of these should be paid £300 apiece on submitting final designs properly worked out. Our hope was that if these conditions were adopted, and proper assessors appointed, nearly all the best known men would enter, as the labour and expense of preparing the drawings for the first competition would be slight. We further suggested that at least six months be allowed for the preliminary competition, and twelve months for the final. The assessors—we mentioned three—were to be appointed before the competition was advertised to draw up the instructions to architects, to

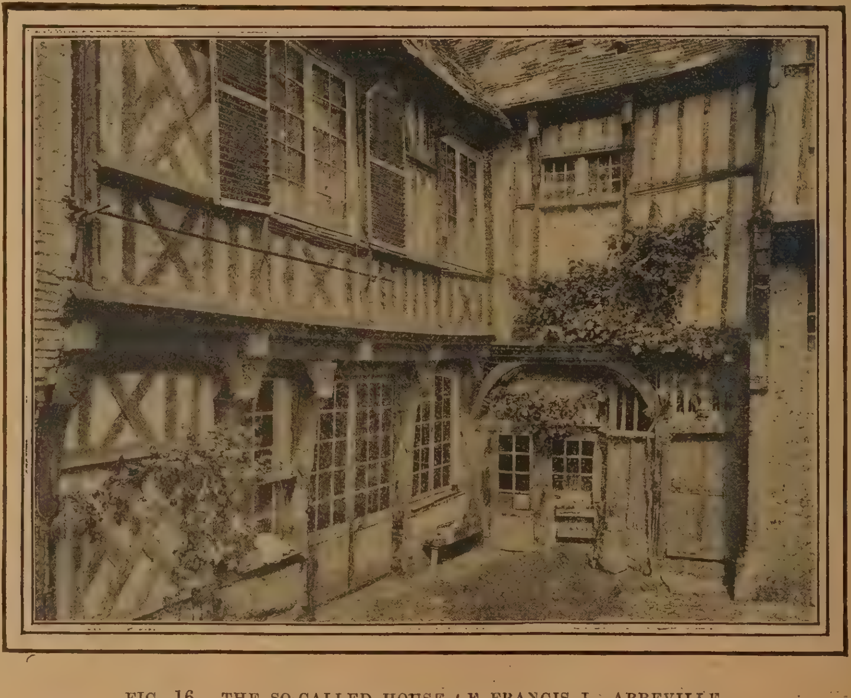

FIG. 16.—THE SO-CALLED HOUSE OF FRANCIS I., ABBEVILLE.

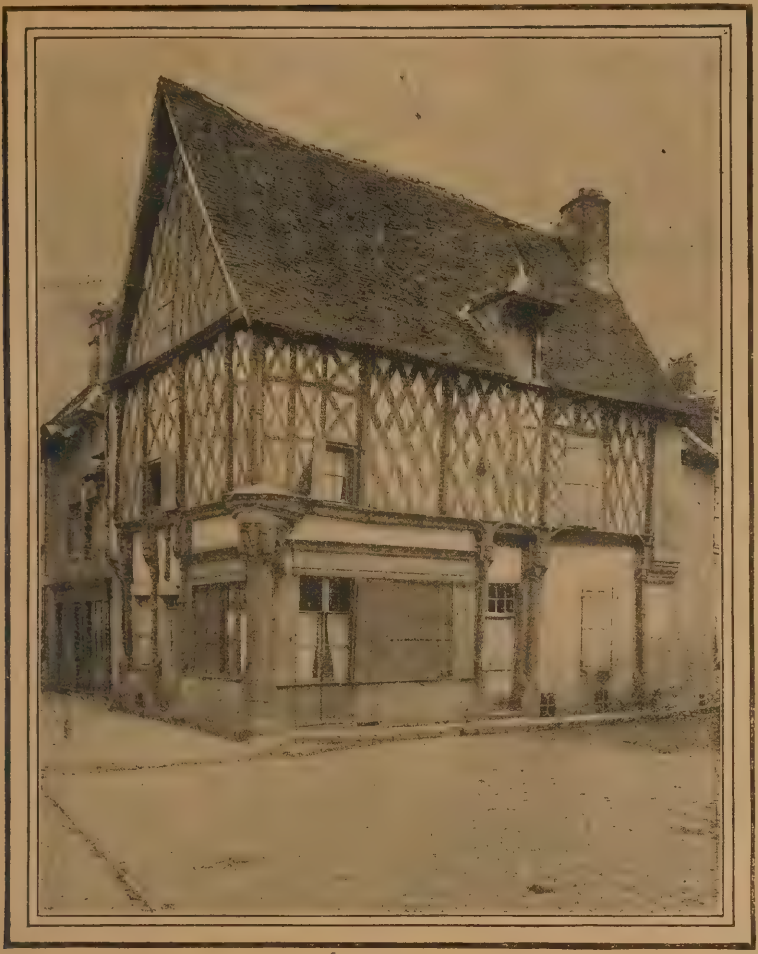

FIG. 15.—WOODEN HOUSE AT LEVROUX.

select the designs for the final competition, and to advise the Committee on the final decision. None of these suggestions have found favour; in fact, I understand that the Committee have decided to dispense with assessors altogether and make their own selections from portfolios of drawings submitted. If this is true, it is opposed to the method under which all important competitions are now decided. It is difficult enough for architects to say from drawings how work will look; still more difficult for men, however able, who have not received a professional training.

The third point was the style to be adopted. After what I have said you will not be surprised to hear that we recommended that no instructions should be issued regarding this. All architects will, I feel certain, approve this recommendation. A cathedral after all has a practical purpose to serve. In architecture the complaint too often is that practical considerations are too much insisted upon, and that architects are not allowed a fair chance of doing justice to themselves. But this is a case of the opposite. Practical considerations are ignored by this restriction; the only result of which will be to fetter the architect; and not only the architect, but all those whom he calls in to assist him.

This is to be the first cathedral of the new century. Is it to be merely the coping-stone of the style of the last century, or is it to be the foundation of the style of the new? Here is a chance for an epoch-making building; for a second Santa Sophia, a second Amiens Cathedral. Is this chance going to be thrown away? The Committee, I am sure, are animated by the same desire as all of us to see a building built worthy of the town and worthy of the opportunity. But, with all deference be it said, they are going the wrong way to obtain it. It is no offence to them to say that not being architects they are out of touch with the architectural movement of the day. They are clinging to a departing style. In an unrestricted competition it is possible that the best design sent in might be Gothic; if so, build it. But the decision of the Committee prevents any attempt being made to show what is possible on other lines. A man who builds a private house for himself in which to live has the right to dictate the style he wishes. But is it not rather different in the case of a cathedral? That is built more for future generations than for the present. The cathedral may take a quarter of a century to build; at the end of that time, if a dry-as-dust design is chosen, and the present architectural movement continues to grow as rapidly as it has done in the last ten or twenty years, it is probable that the first cathedral of the twentieth century when finished will be as obsolete in style as an old East Indiaman is now.

[P.S.—Since the foregoing was written the instructions to architects have been published and confirm the unsatisfactory feeling produced by the preliminary announcement. Is it still too late to do anything regarding the two most important points, the question of style and the appointment of assessors?]

THE LIVERPOOL CATHEDRAL COMMITTEE'S MEETING.

WHY GOTHIC WAS ADOPTED.

A MEETING of the Liverpool Cathedral Executive Committee was held last week at the Church House, Lord Street, Sir William Forwood presiding.

Mr. Robert Gladstone said he desired to make some reply to the remarks made with reference to the rapidity with which they had come to a very important decision—that of the style of architecture to be adopted. He might say that when that decision was arrived at they had a very full committee, including the Lord Bishop and Lord Derby—very important members of the Committee; the subject was very fully and seriously considered, and the decision was unanimously in favour of Gothic. There was no question raised as to the possibility of any other style being adopted. He thought they had come to a very sound decision, because, however appropriate other kinds of architecture might be for public buildings such as town halls or places like the Philharmonic Hall, theatres, &c., he thought there could be no question whatever in the minds of thinking people that Gothic architecture produced a more devotional effect upon the mind than any other which human skill had yet invented. He had sometimes been asked why they had not got a twentieth-century style, or at least why they should not strive for one; and why our architects could not invent something more in accord with present views of public worship and present ideas of religious architecture. He could only reply that there appeared to be no such thing in existence, for with the exception perhaps of the Crystal Palace, an erection of glass and iron, every public building without exception in this country was a reproduction in some form or other of former styles. Sir Gilbert Scott had said with reference to the most beautiful interior of Gothic architecture in this country—that of Westminster

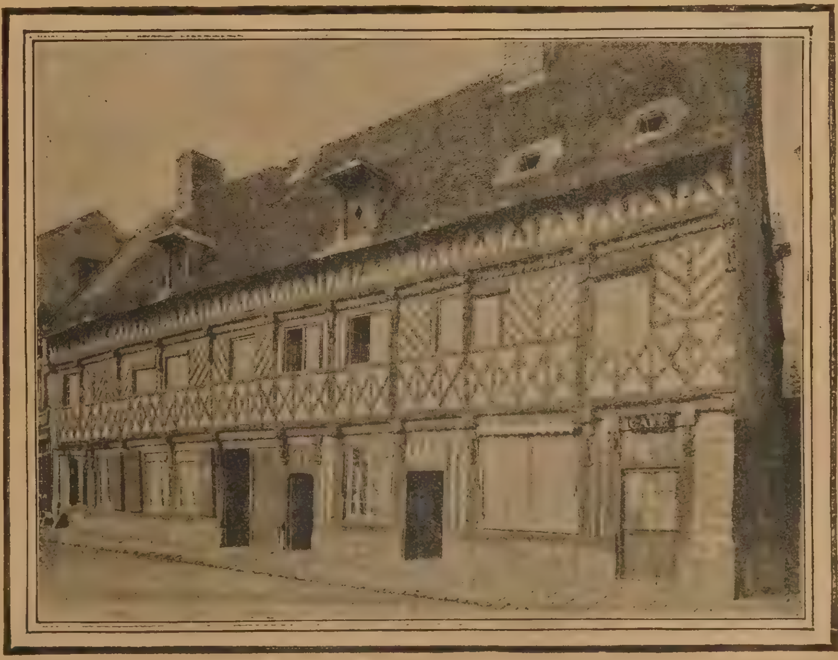

FIG. 18.—HOUSES AT SAINT-VALERY-EN-CAUX

Abbey—when addressing the Royal Institute of British Architects: "It is a building which does not owe its claims upon our study to its antiquarian and historical associations, intensely interesting though these must be to every man worthy of the name of an Englishman. It has claims upon us architects, I will not say of a higher but of another character, on the ground of its intrinsic and superlative merits as a work of art of the highest and noblest order, for there are few churches in this or any other county having the same exquisite charms of proportion and artistic beauty which this church possesses; a beauty which never tires, and which impresses itself afresh upon the eye and the mind, however frequently you view it, and however glorious the edifices which during the intervals you may have seen." He thought that all who had seen it must agree with what Sir Gilbert Scott had said. The great period of Gothic architecture was the hundred years which elapsed between 1220 and 1320, when the early English entered upon the Decorated period. After that Gothic architecture became too much taken up with detail. In Westminster Abbey and other great churches built in that period they found a majestic simplicity in the architecture which conduced, as he thought, most highly to devotional feelings and to the proper conduct of public worship. Therefore he hoped the Committee would adhere to their decision. On the subject of the selection of an architect there had been an unintentional mistake made, which rather led people to believe that it was to be a limited competition. The Building Committee recommended that it should be an unlimited competition. It stood to reason that there were many competent architects in this country who had had little or no opportunity of doing ecclesiastical work at all, still less on the scale of a cathedral, and they thought it desirable to let those who had not yet built churches or even designed them have an opportunity of showing what they could do.

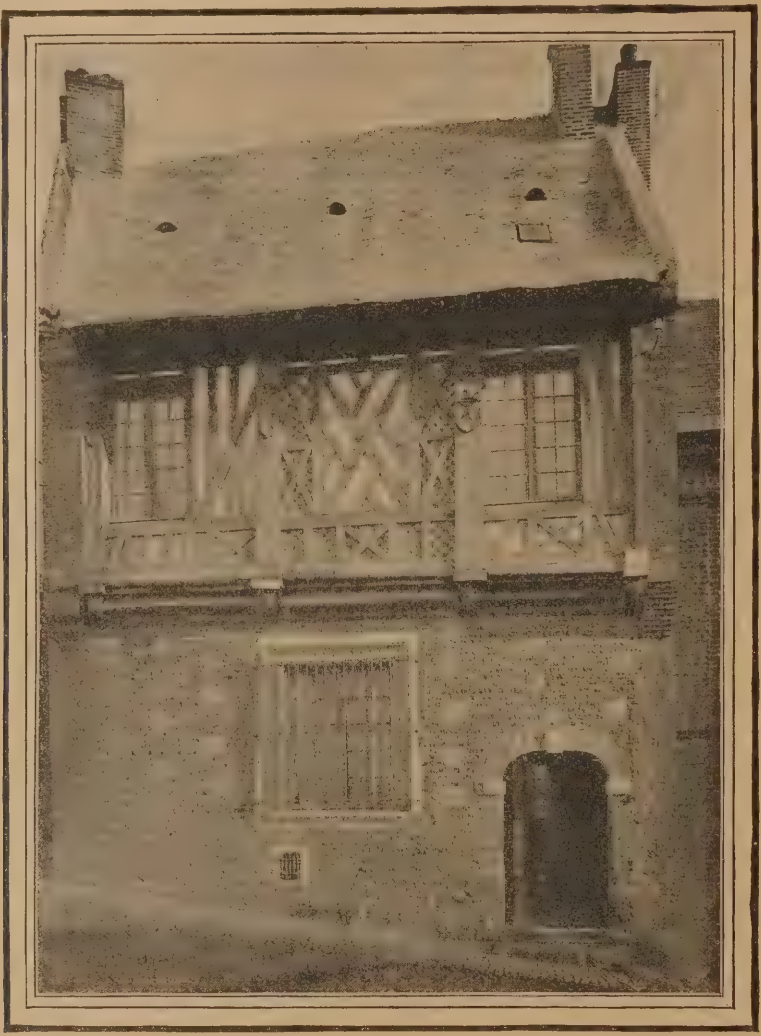

FIG. 17.—THE PRESBYTERY AT TREPORT.

The Committee, having discussed the invitation to be issued to architects, finally decided that they should ask for an unlimited competition in the first instance, drawings of work already done, or designs, to be sent in by December 31st, the Committee reserving to themselves discretion as to employing a professional assessor in making the selection of candidates for the final competition, and also the right to invite architects who should not take part in the first competition to send in designs for the final one.

The minutes were then unanimously confirmed, and the meeting concluded.

Mr. T. G. Jackson's Views.

In a letter to the "Times" Mr. T. G. Jackson, R.A., says:—The Committee with whom rests the choice of an architect for the proposed cathedral at Liverpool are, I believe, about to invite architects who aspire to that great work to submit portfolios of drawings or representations of buildings they have done; and from the field of candidates so formed a certain number are to be chosen to make designs in competition.

May I point out reasons why this plan, which at first sight seems to promise well, is not one from which a successful result may be considered certain, and to suggest a better in its place?

There is, of course, nothing new in the idea of choosing your architect from drawings of what he has done. But this may be and often is a quite fallacious test of his ability. The drawings from which the choice is made are not working drawings. They would be unintelligible to any but an architect—certainly to a committee. They are perspective views which may give a very different aspect to the building from the real one. A draughtsman can represent it from a point of view which is not in reality accessible; or he can surround it with circumstances that exist only in his own imagination. He can exaggerate or diminish its scale, and he can bring his favourite points into unnatural prominence, and repress what he is conscious are weaknesses in his design. It is true photographs of existing buildings do not deceive in the same way; but, on the contrary, they generally make a building look its worst, and far from flattering the design seldom do it justice.

It is high time that a protest should be made against judging architects by their drawings. An architect is not a draughtsman but a creator. It is only by his works that he can fairly be tested, and not by the drawings of them. If the Liverpool Committee are really anxious to get the best man for their new cathedral, is it too much to ask that they should go and look at such modern work as has been approved by competent judges or by general consent, and in that way arrive at a choice of competitors? It would no doubt give them some trouble, but the occasion is one that is worth any amount of trouble; and if the labour is not to fall on the shoulders of the Committee of Selection, on whom should it fall?

If it be said that this would exclude young men of ability who have not many executed works to show, I may point out that the Committee's own scheme does just the same; for men who cannot point to many works actually executed certainly will be unable to submit drawings of them.

A Criticism by Mr. T. Myddelton Shallcross.

Mr. T. Myddelton Shallcross also writes to the "Times" on the subject. He points out that the site selected—that of St. James's Mount—has been unanimously condemned, on its merits, as an unworthy and unsatisfactory one by the Liverpool Architectural Society, and has also been disapproved of by the leading architectural journals, and by a host of individuals. "Even its cheapness is, however, more apparent than real; for, as this feature is due to the fact of the site being an open space and a public recreation ground, the probable future demand for the creation of a public space to replace it will likely cost in the end a greater sum than the estimated difference between the cost of the two sites under consideration, even assuming that the estimated difference were confirmed by the actual result of purchase, which is doubted. . . Better by far that this generation should have contributed the site only, but as perfect a one as their means permitted, than both the site and the building of an inferior character. . . .

"It is not conceivable that in any business of commerce such a condition would be propounded as has been for the building of the cathedral—that the art, science, thoughts and lives of those of the present age should be ignored, and that a lifeless copy of the works of those who lived in a previous age, say in the thirteenth or fourteenth centuries, and the conditions of whose lives were so totally different from those of one's own time, should be required from the designer of the Liverpool Cathedral. . . .

"Regarding any work not architectural, there would never be any question but that all the experience of the past and the accumulated knowledge and art of the present would be brought to bear upon it; and the instructions which the promoters of such an object would give to their advisers would be admittedly ludicrous if trammelled by the conditions which the promoters of the Liverpool Cathedral have laid down for architects. Such conditions must inevitably ensure the atrophy of all an architect's originating brain-power and the substitution of the deadly spirit of plagiarism. . . .

"As to the competition, an architectural competition for any building, excepting under well-defined conditions and subject to the appointment of a professional assessor of repute, seldom, if ever, ensures the best design being obtained; and even under those favouring circumstances the result is frequently disappointing and unexpected. The form of competition which the promoters of the Liverpool Cathedral have decided to inaugurate is certainly not likely to ensure either good and spirited design or that the designer would, in human probability, live to see his design completed."

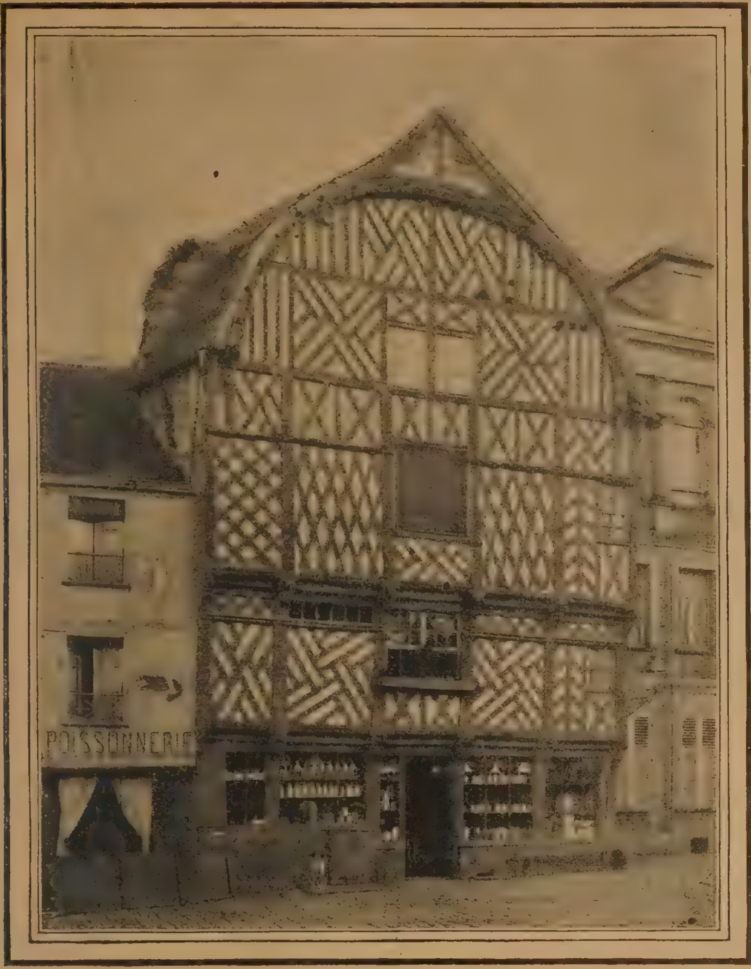

FIG. 20.—HOUSE ON THE GRAND PLACE, ROYE.

LONDON COUNTY COUNCIL.

THE YEAR'S WORK.

At last week's meeting of the Council, the first after the recess, the chairman (Mr. Torrance) delivered an elaborate address dealing with the year's work, in the course of which he said that the whole staff at the central offices now numbered 803, and the crying need for new offices was emphatically illustrated by the fact that more than half the staff of the central offices was housed away from the main building, and in some cases in premises which were quite unfit to be used as offices.

Dealing with the work of the Main Drainage Committee, the chairman said the quantity of sewage dealt with during the year was 81,679,630,537 gallons, 2,424,000 tons of which, in the form of sludge, were taken out to sea Bearing in mind that the main drainage system served a population of 5,147,000, it was not surprising that the Committee's expenditure amounted to £338,561. The Committee had submitted a scheme for the enlargement of the main drainage system at an estimated cost of £2,947,000, in order to provide for the enormous growth in population and to reduce the number of storm-water discharges into the River Thames. Of these proposals the Council had already sanctioned the construction of additional outfall sewers at a cost of about £1,263,000. Portions of the work, estimated at £180,000, had already been commenced, and the remainder would be proceeded with as soon as the necessary arrangements could be completed, the drawings of some portions being well advanced. Experiments were still being made in the bacterial treatment of sewage at the Barking and Crossness Outfall Works.

As to the work of the Bridges Committee, the Rotherhithe Tunnel was rapidly leaving the preliminary stage, and Greenwich Tunnel was half completed. The reconstruction of Vauxhall Bridge was also being proceeded with.

The total nett capital expenditure sanctioned in respect of street improvements was £647,769. The two most important were the new street from Holborn to the Strand, and what was known as the "Westminster Improvement Scheme." In connection with the work of the Improvements Committee, he noted that the total gross expenditure of the Council in respect of the county improvements already sanctioned and now in hand, or about to be undertaken, was estimated at £11,065,207, whilst the nett expenditure, after deducting recoupment, was estimated at £5,202,642.

As to tramways, the Highways Committee had vast schemes in progress and under consideration. It would not rest content until every district in London was properly served with tramways. It was convinced that horse traction was doomed, that electricity must be the future power, and that the conduit system must be adopted.

With regard to the duties of the Building Act Committee, during the year under review 7,389 new buildings were examined, for which fees amounting to nearly £21,000 were received, being the greatest amount in fees received in one year since 1881; 2,966 cases of dangerous structures were dealt with, and 680 summonses were issued in consequence of the failures of owners to comply with the requirements of the Council.

With regard to the future, there was much to do, requiring strong hands and stout hearts. One could not become eloquent on main drainage or bridges, the efficiency of which were both so necessary for health and convenience. When they looked at London they could become sadly pathetic over its congested and sorrowful condition. In their despair they worried the sorely-harassed Housing Committee in its determined effort to solve the heart-breaking problem. Compared with Glasgow, a city within itself, sending its beautiful electric cars to every corner of its wide domain, its fine bridges, rationally and sensibly used for the good of the whole community, the condition of London, with its conflicting chaos of interests, where the toiler was daily at his wits' end to know how to get to or from his work, made one grow indignant. They inherited their Augean stable. There was no Hercules now. But there had been determination and resolution, and London was brighter and better than it was.

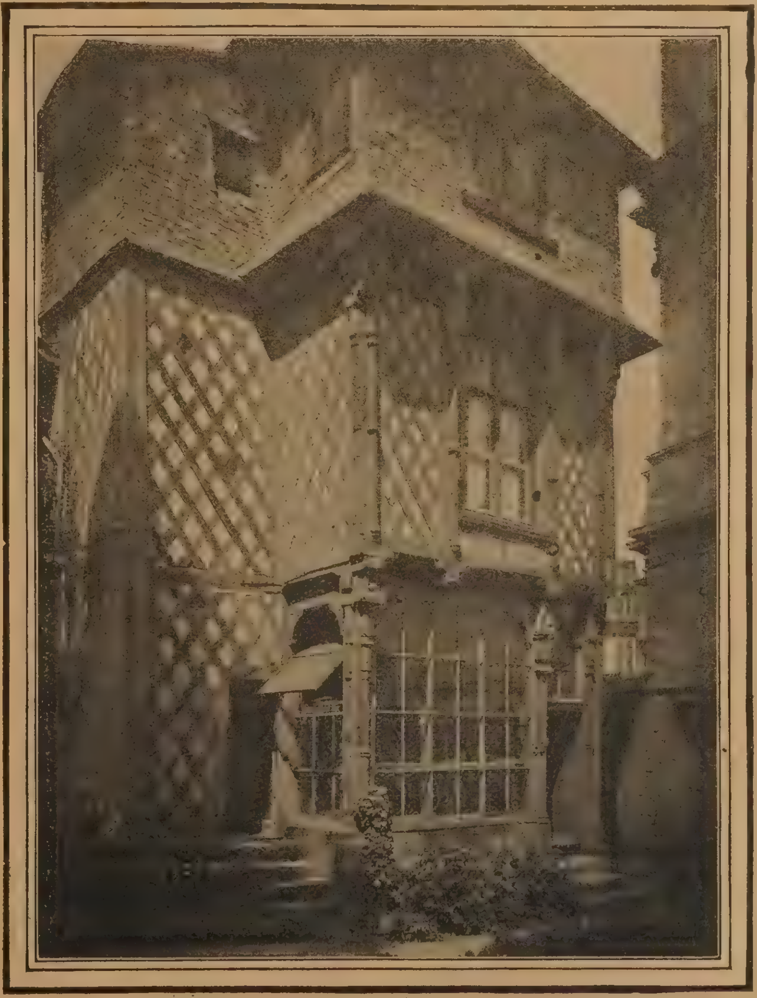

FIG. 19.—HOUSE NEAR THE CATHEDRAL, RENNES.

Law Cases.

Air-Space and New Buildings.—At the Hove Police Court on October 7th William Lawkin Duck was summoned for contravening by-law 62 with respect to new buildings at 13, Highdown Road, Hove. Mr. Woolley (for the Corporation) explained that the case was an infringement of the by-laws relating to the provision of air-space. When the building was first seen in April last it was resting on the ground and had a corrugated iron roof. It was encroaching on the air-space allocated to the house. The defendant's attention was called to the matter, and in the following May stated that he would put the building on wheels. This was done, and the roof was also taken off. The roof, however, was still remaining as it was piled at the side of the building. The latter was described as a portable under-carriage for a motor, but how it could be such Mr. Woolley said he did not know, as there was no flooring to it. The building was practically but a shelter for a motor car. William Purchase, assistant borough surveyor, said the building was built of combustible material, and no plans had been sent for approval to the council. Mr. Marx, addressing the bench on behalf of his client, contended that no offence had been committed within the meaning of the by-laws. Mr. E. D. Long, of Brighton, architect and surveyor, said that the structure could not be described as a building, as there was no floor, no roof, and it was on wheels. He found that the extent of the air-space was 380ft. super. The by-law required that there should be 300ft. for air-space; and as the erection did not occupy 80ft. super. there was still an excess of the air-space required by the by-law. The magistrates unanimously came to the conclusion that this building was one within the meaning of the by-law, and they found that it was an infringement of the by-law with regard to the air-space. There would be a penalty of 20s. and costs.

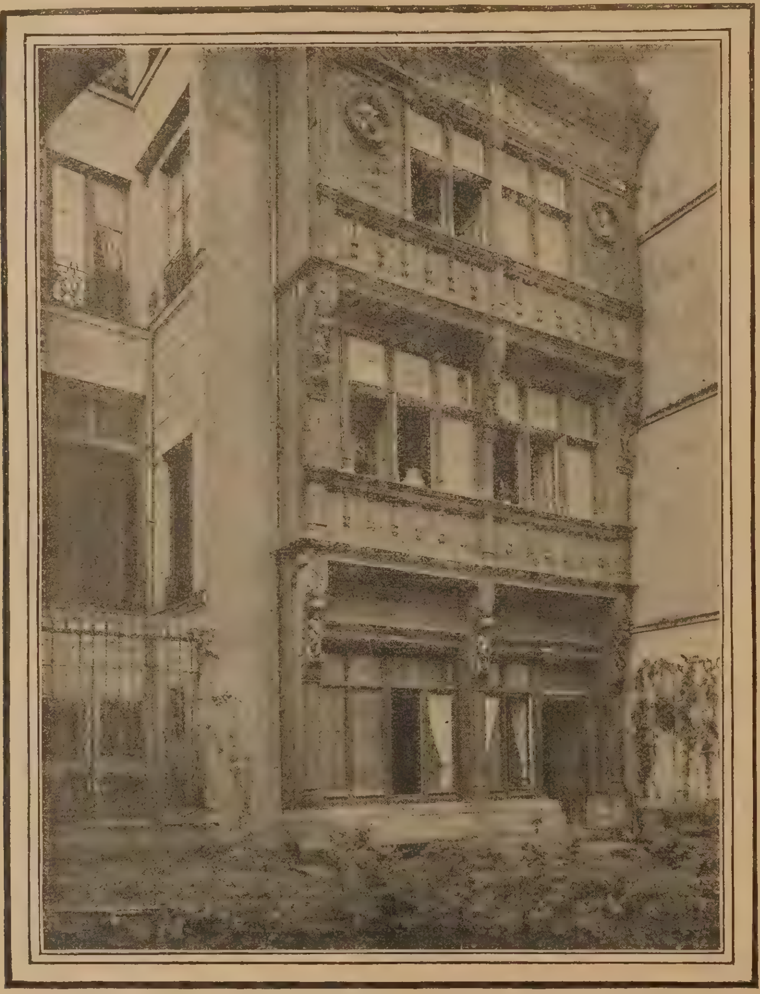

FIG. 21.—WOODEN HOUSE AT ROUEN.

Messrs. Antill & Co.'s Bankruptcy.—A sitting for public examination was held in the Court of Bankruptcy last week in the case of William Antill, A. W. Peterson and W. H. & E. A. Young, builders, of Mornington Crescent, Camden Town, carrying on business as W. Antill & Co. The liabilities are returned at £10,211, against available assets £7,462. The failure was attributed to loss on trading, but the Official Receiver suggested that the debtors had contributed to their insolvency by excessive drawings since 1900. The examination was concluded.

A Question of Stairs in a Bonded Store.—A case of considerable interest to builders recently came before the Kinning Park Dean of Guild Court, Glasgow. It was an application for lining by Messrs. Slater, Rodger & Co., Ltd., to erect bonded stores at the south-east corner of West Scotland Street and St. James's Street, Glasgow, on ground recently occupied by the Birkenshaw Coal Co. The plans showed only one flight of stairs leading to the upper storeys of the building, and to this the court took objection. They alleged that the exit for employees, in the event of an outbreak of fire, was totally inadequate. The petitioners, however, pointed out that there would only be three persons engaged in the upper storeys of the building, and further that these workmen must necessarily be under the supervision of the Customs officers, and they could not be so if there were more than one flight of stairs. The court were of opinion that it would be advantageous, as well as adding to the safety of the employees, were a spiral staircase placed at each end of the building. To this petitioners demurred as being unnecessary. After expert evidence had been led, the court agreed to pass the plans on condition that the stair in question was removed 20ft. south and a fireproof passage constructed from the foot of the stair to the street.

Correspondence.

A Friendly Criticism.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—I should like, if you will allow me, to make a friendly criticism of the designs by Mr. A. J. Hardwick and Mr. H. Atkin Berry published as centre plates in your issue for October 2nd.

The plan of the house at Roehampton has some commendable features. The sitting-room hall would be a useful and pleasant place, especially in summer; but to make this type of house really snug and comfortable the staircase should be well cut off to avoid draughts. The elevations are well treated, but I think the roof over the dining-room might be constructed so as to avoid the central gutter, which, in nine cases out of ten, is a constant source of trouble to the occupant. The plan would be improved if the doors to the drawing- and dining-rooms were not placed so much in line with the fireplaces. With a French casement to the dining-room bay window the side-entrance door might be omitted and this space more usefully occupied by a pantry. The back stairs should be placed along the hall wall, and a small ante formed where the cupboard is shown; this would give access to the kitchen and back stairs as well, it would cut off all smells, and would not encroach so much upon the floor-space of the kitchen. The scullery is very small, and no pantry is shown, and with such a high wall the verandah would be practically useless. Why a wall at all?

A good attempt is made in the plans of the houses at Ditton Road, Surbiton, to give a roomy entrance hall instead of a long staircase passage, so common in houses of this kind. The square bay and angle fireplace would be a very pleasing feature, and would give character to the house. In semi-detached houses it is a good plan to run the party wall out as far as the line of bay (as is done in the drawing-room in these plans) to avoid being overlooked by your neighbour and to save space in the rooms. The kitchen door should not enter direct from the hall, nor is a porch required to the back door; this space might be added to the coal place, and a small space for hats and coats taken from it. If the kitchen were placed where the scullery is shown and the latter put against the dining-room wall, a small ante could be arranged and cut off by a swing door. In this plan the scullery is very small, and little provision made for a pantry, &c.

The house at Warlingham, Surrey is, very sensibly treated and suitable for a country district. From the elevations one might expect it to be well planned. It is a pity that no plan is given, as so much depends upon the internal arrangement.

These criticisms are offered in a friendly spirit, and must be taken for what they are worth, but I have long been of the opinion that a criticism upon plans illustrated from time to time would be of great advantage, especially to the younger members of the profession.—Yours truly, X.

[We shall be glad to consider criticisms of any other designs which readers may care to submit. With regard to our correspondent's remarks about the plans of the house at Warlingham, we may say that when application was made to the architect for them he replied that he did not wish the plans to be published.—ED. B. J.]

"The Magazine of Art."

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—If Mr. B. W. Dexter will kindly re-read my note under this heading in your issue for October 2nd he will see my reference was to the first three volumes of this publication, which contain neither date, preface nor any indication of the time of issue. Mr. Dexter's possession of the original forel in which the first actual monthly number was issued is additionally interesting, and is evidence conclusive that the work was not originally issued, as assumed, in the first month of 1878. This goes to show therefore that the volume for that date—although it contains nothing to suggest the fact—does not embrace twelve monthly numbers, but only eight.—Yours truly, HARRY HEMS.

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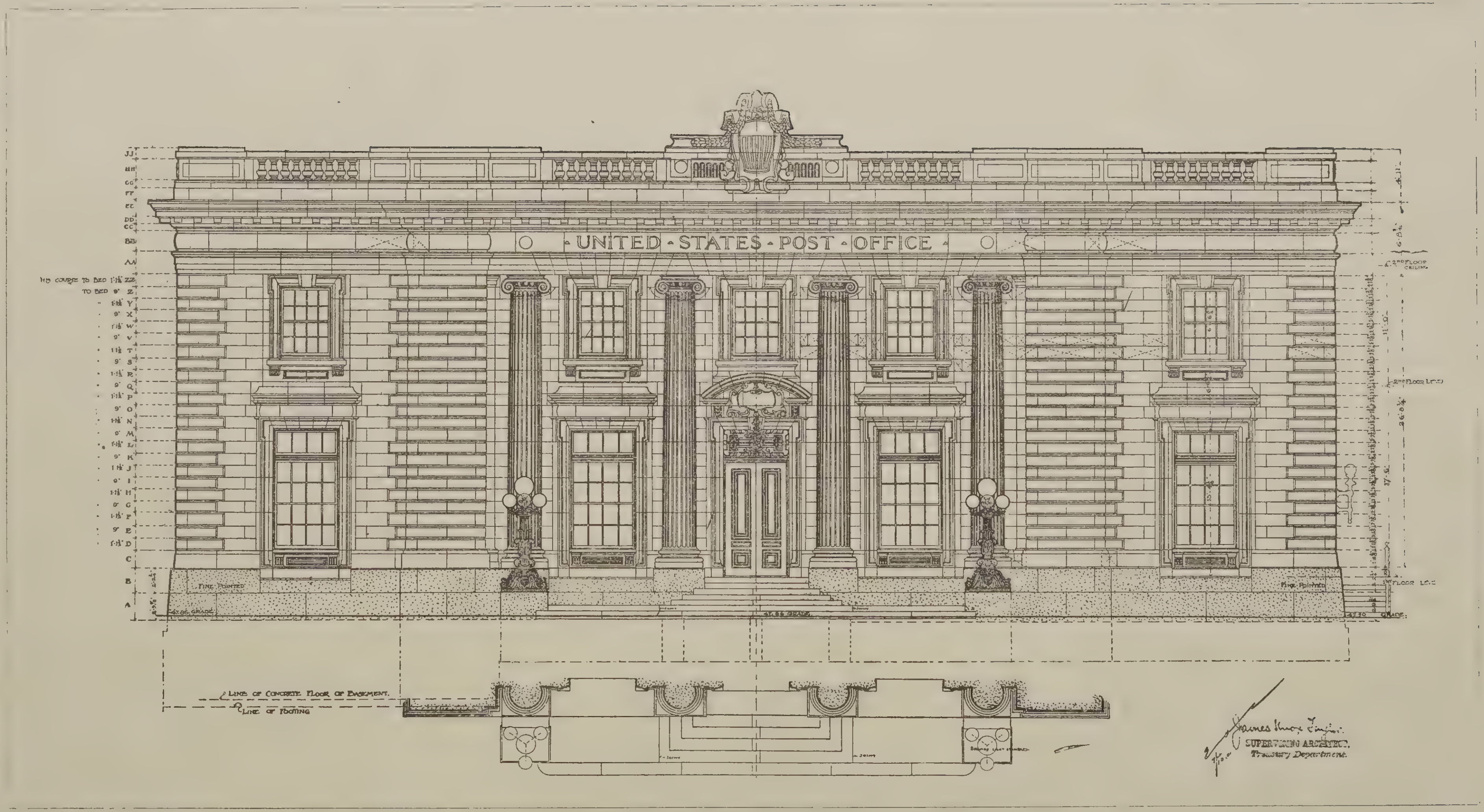
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, October 16th, 1901.



UNITED STATES POST-OFFICE, JOLIET, ILLINOIS: FRONT ELEVATION. James Knox Taylor, Supervising Architect.

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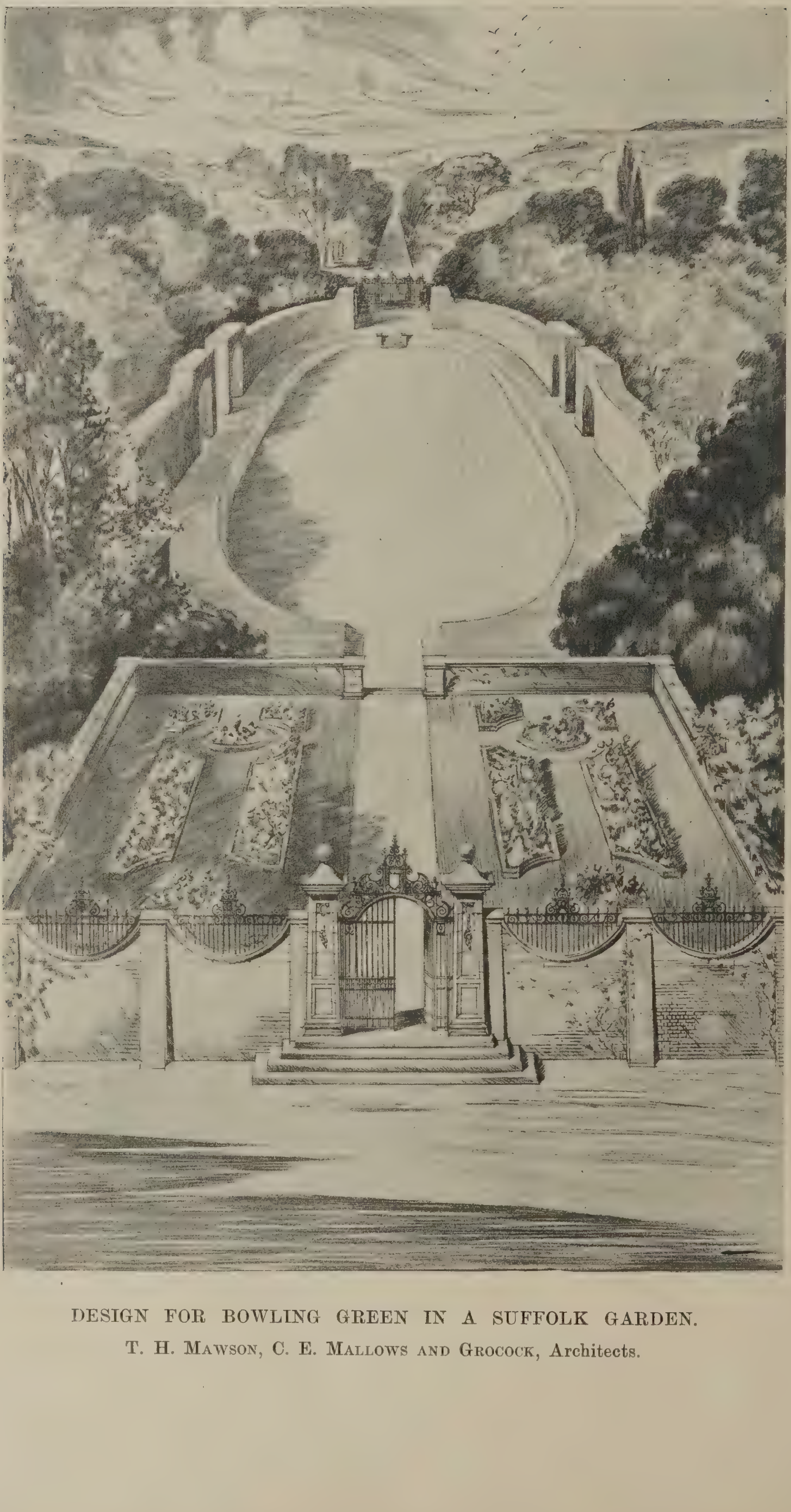
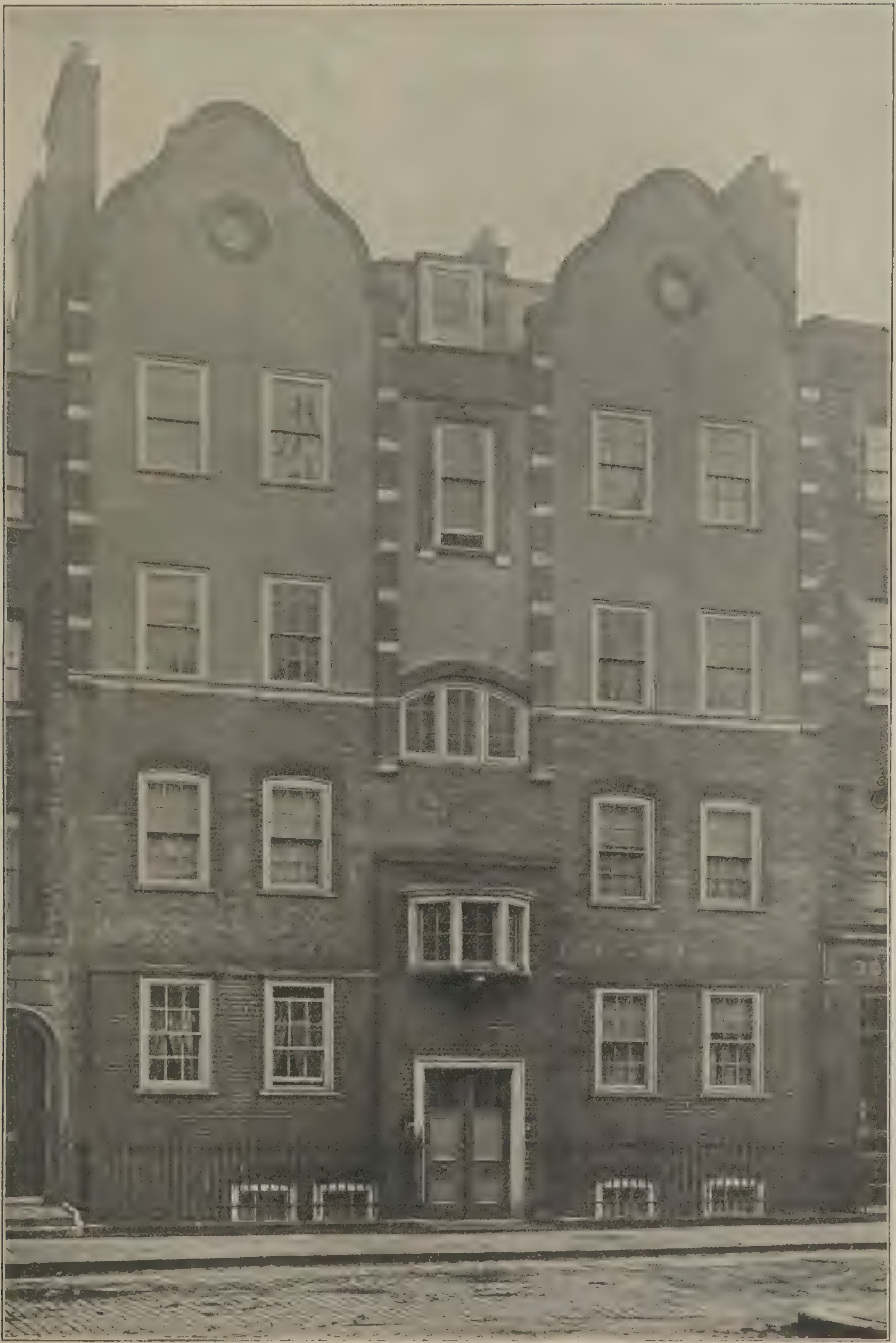


DESIGN FOR BOWLING GREEN IN A SUFFOLK GARDEN.

T. H. MAWSON, C. E. MALLOWS AND GROCOCK, Architects.

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, October 16th, 1901.



GORDON HOUSE, FOLEY STREET, LONDON, W

H. Fuller Clark and Percy A. Boulting, Architects.

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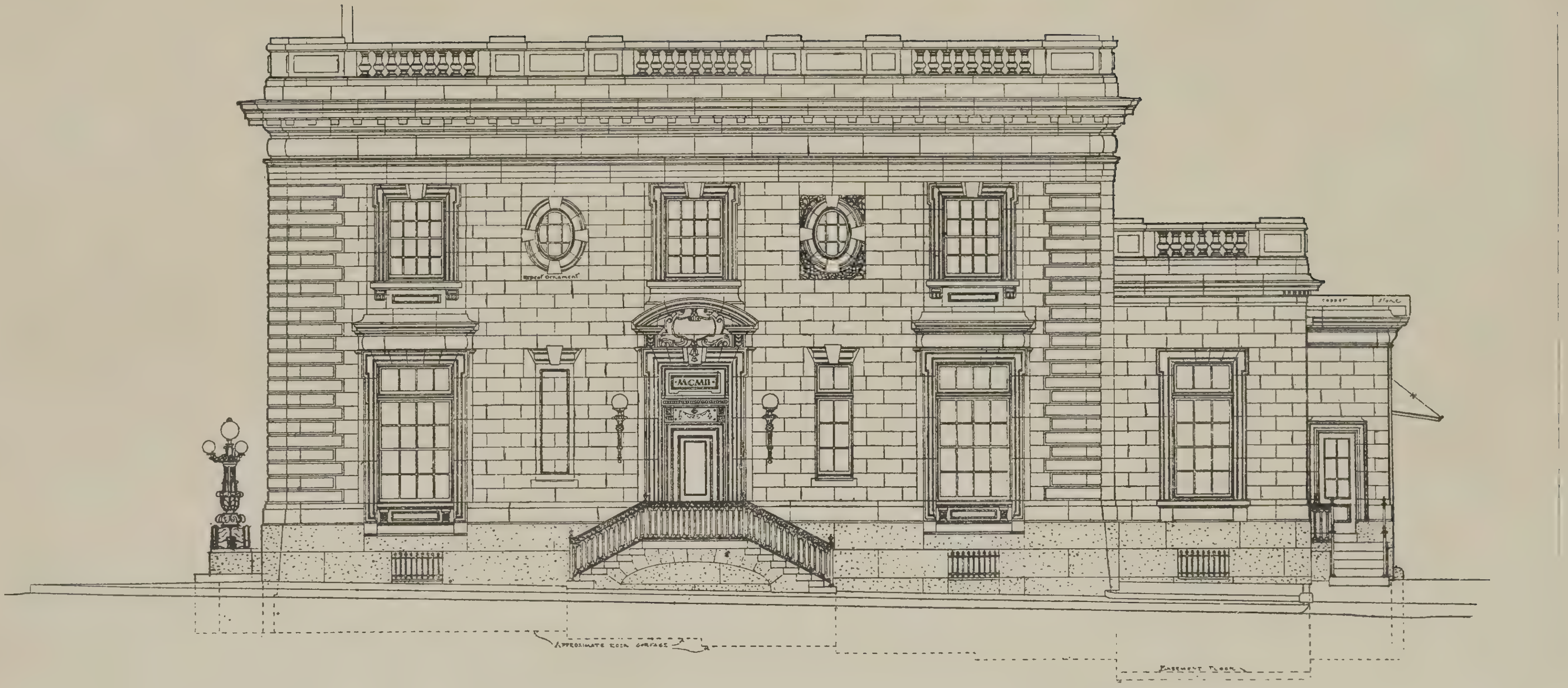

UNITED STATES POST-OFFICE, JOLIET, ILLINOIS: SOUTH ELEVATION. James Knox Taylor, Supervising Architect.

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THE PRESIDENT'S ADDRESS TO THE ARCHITECTURAL ASSOCIATION.

THE annual general meeting of the Architectural Association was held on Friday evening last at 9, Conduit Street, W., the chair being occupied by the president, Mr. W. Howard Seth-Smith, F.R.I.B.A. After the minutes of the last meeting had been confirmed, Mr. Edward W. Mountford moved the acceptance of the committee's report and balance-sheet for the past session. This was seconded by Mr. Baggallay, and carried unanimously. Mr. F R. Herring (Clapham) and Mr. T. H. Swinyard (London, N.) were then elected members of the Association, after which the president moved a vote of thanks to the Royal Institute of British Architects for its tenth annual grant of £100 towards the educational work of the Association, and also a vote of thanks to Mrs. Cates for presenting books bequeathed by the late Mr. Arthur Cates. A vote of condolence with the relatives of the late Mr. James Brooks was also moved. The prizes won by students during the past session were then distributed, after which the secretary announced that the annual conversazione would be held on October 25th at the Institute of Painters in Water Colours in Piccadilly, at 8 p.m. The president then read his inaugural address. He said that the past session had been one of unparalleled prosperity, clouded only by the losses sustained by death, which claimed eight members. But the passing of some men left so great a void that the whole complexion of things was altered. Such men were John McKean Brydon, Arthur Cates and William Young; and they could be paid no higher tribute than to say that they possessed that admiration and trust to which their professional attainments as well as their personal goodness entitled them.

During the past session success had attended all departments of their work, 116 new names having been added to the membership roll and six members re-instated, while the financial position was the best on record. The Sketch-Book, which for thirty-five years had figured so largely in connection with the work of the Association, and which had hitherto been produced by an independent committee (with Mr. William G. B. Lewis and Mr. William A. Pite as editors, and Mr. Edgar H. Selby as treasurer and secretary), had, at the request of these gentlemen, been taken over by the general committee, in whose hands it ought to become a valuable property.

Continuing, Mr. Seth-Smith said:—

The Day School.

The past history of this Association is a history of education. In accordance with its traditions we have, during the session just closed, tried to meet the demands of the profession and of the public for better education as far as those demands can safely be ascertained by a careful review of art-feeling in the community, and the growing sense in the profession that with us lies in great measure the responsibility for raising public taste in building. This sense of the beautiful can only grow as it is nurtured by observing the objects of beauty it is our function to create. You have, after mature consideration, added to the curricula a day school, and with its opening next week, we enter upon a course entailing increased responsibility upon this association. You are probably all conversant with the general principle of which this school is the outcome, namely, that if a young man is not to waste his employer's and his own time it cannot possibly be a good thing that he should be plunged into a busy office without some preliminary training. It is difficult to imagine on what grounds such a principle can be objected to. We are happy in having secured the services of Mr. Arthur Bolton as headmaster of this school. In his hands it is sure to grow and prosper as the evening studio has done under Mr. Lewis's direction. We feel satisfied it will receive the encouragement of the profession. Success depends on this. I would urge young men whose bent is towards architecture to enter this school, either directly or by agreement with the principals to whom they may wish to be articled. I believe most principals of standing will be found willing to give such pupils as may be unable to attend the evening school facilities for attendance, if not regularly, at any rate for two or three terms at stated hours for certain courses they particularly need. Such an arrangement will be as advantageous to them as to their pupils, while those whose minds are not fully committed to this line in life will, by entering the school, have an opportunity of re-considering their decision in the light of experience.

In no better way than by mingling socially and educationally as they do here with a body of enthusiastic fellow students and practising architects can men become emulous of the highest excellence. Nor, indeed, can they ascertain their own true level except by thus comparing themselves with those less, or more, gifted. All this gives a unique value to our association as a training ground.

Cramming.

A word here to our students in both evening and day schools. The committee too often observe a desire to go up for the R.I.B.A. examination after only a few months' direct preparation. This means cramming; cramming means working at high pressure, and high pressure, as surely as a neglected education, spells failure; not perhaps in passing the formal test, but in practical success in after life, which every student will admit is the real goal of professional education. The A. A. will, I hope, never be a party to this sort of thing. You must go elsewhere if you want it. It is not education at all. Passing the examination will make a man neither a skilled draughtsman nor a good builder; but if he masters these essentials his success is assured, and they can only be attained by a long and patient course of work, systematised as carefully as it has been by this Association. Above all things believe that no system, however complete, can teach you architecture; at its best it can but provide conditions suited to work, and teach you where and how to learn. Your education—your mental development—will be the result of your effort to apply the information offered and to work it out for yourselves.

The Ethics of Examination.

If the diploma (membership) is sought merely as the Institute's assurance to the world that you have had such a systematic training; as a guide to the subjects which it is necessary to know, and as an incentive to work at them; surely nothing but good can come of the examination which qualifies for that diploma. Let Emerson's testimony to our national character, written fifty years ago, inspire us to-day. In England he says: "Every man is trained to some one art or detail and aims at perfection in that; not content unless he has something in which he surpasses all other men. He would rather not do anything at all than not do it well. I suppose no other people have such thoroughness."

Generalization and Specialization.

As our art has a technical basis, this Association, if it is to become the educational power it aims to be, must act upon the universally admitted dictum so well expressed recently by Sir John Gorst that, technical instruction cannot possibly be assimilated by a student unless a proper foundation has previously been laid by a thorough grounding of elementary and secondary instruction. Surely this is also true of art. The more thorough an artist's general education the more alert will be his mind in all directions and the more rapidly will he appropriate and assimilate the special knowledge needed to fit him for his chosen life-work. I therefore hope that the Committee will before long see their way to make admission to this day school conditional upon passing the R.I.B.A. preliminary examination or its exempting qualifications. And what is true of a broad grounding in general education in youth is equally true

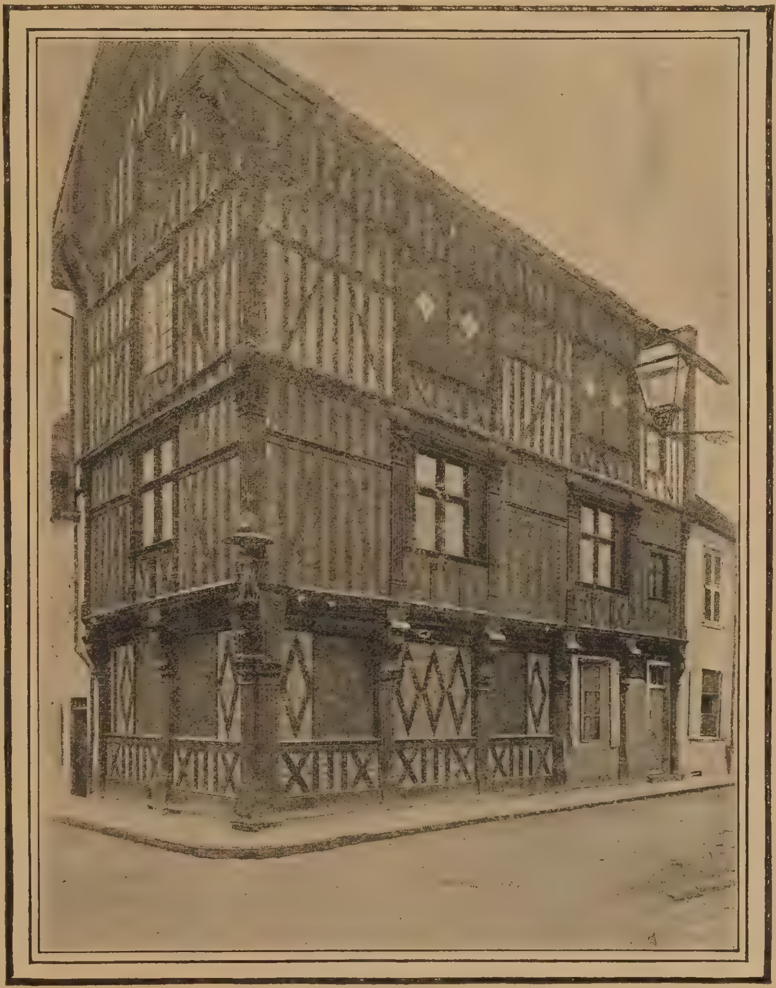


FIG. 22.—WOODEN HOUSE AT BAR-SUR-SEINE, AUBE.

of early professional training. You must not specialize until you have some knowledge of every subject essential to the practice of every ordinary architect. The Association has been most careful not to introduce into its curricula any subject which does not come under this category.

Mr. Lethaby and his Paper.

Perhaps the most striking contribution during the past year to the discussion of this great question was Professor W. R. Lethaby's paper read before the R.I.B.A. entitled "Education in Building." It is an able history of the conditions under which architecture was carried on in the Middle Ages and up to the time of the Renaissance. He exhorts us by every means within our reach to encourage a high standard of practical excellence on the part of our executants (the British workmen) and to see to it that we ourselves not only understand building construction as the A. B. C. of our profession, but that we endeavour to bring about a more co-operative spirit as between architect, builder, and mechanic.

But even supposing the buildings of those times were not under the control of a "magister" who designed and commanded, but were the creation of an "operator ipse magister," as contended by Mr. Lethaby, he appears to us to under-rate the effects of the vast social and educational change the whole community has undergone since the days of which he writes, and the impossibility of adjusting the old customs to modern requirements. Then it was only the King, the clergy and the nobility who were patrons of the building art. We now have a very numerous and educated upper middle-class who can afford to build. Their travelling and knowledge makes them critics in the matters of art, and anxious to imitate the ancient work they have seen.

The Architect: The Artisan.

All this has resulted in a demand that those they employ to design and direct their projects shall be of their own class; shall know more than they themselves of the history and structure of these admirable works of old; and shall build with an approximation to the same feeling —shall in fact be scientific where they are dilettante. Professionalism is the expression of this demand for a high standard of training. Professional men, including those whose function is design and draughtsmanship, have come to stay. They form a large section of the upper middle-class and they are largely employed not only by those of their own and of higher social status, but also by the numerous bodies representative of all classes alike, who prefer to be advised (in carrying out complicated architectural problems unknown to mediævalists) by men who have been thoroughly trained, through long years and at great cost, in the art of planning and in the knowledge of building construction, rather than by mechanics, whose blunders, inevitable where several trades are working without a general superintendent, would not be tolerated in these days of scientific method and exactitude.

Not enough Specialization.

It is a fault in our training that our pupils are not on the works enough, and that we do not specialize enough. Highly-trained men, with a diploma from a guild or an institute or what not, ought really, if our building is to be of our best, to confine themselves to design and the supervision of building construction, and not to meddle with surveying, valuations and dilapidations, bills, &c., work which certainly does not savour of art. When as a profession we are more thoroughly trained, and when our occupation has obtained legal protection from the competition of unqualified persons, we shall be in a position to adopt more generally this higher standard of work. And when the last of these conditions is established the first will naturally follow and the public will employ us more generally.

Architectural Registration.

The absolute necessity of some protection of the title of architect and its confinement to duly trained men is being more widely felt every year. In addition to the striking unanimity of Continental professional opinion which I mentioned a twelvemonth ago, we now have the weighty and closely-reasoned pronouncement of the President of the Institute in favour of something of the kind. The Institute's policy, since the establishment of the examinations, is incomprehensible and illogical, excepting as based on this principle. After all, the proposal is only that the State should give us a justly-acquired right to the expensively-acquired skill and knowledge which it demands in the same spirit as it did to the mediæval Guilds, but in the manner dictated by the political and social conditions of to-day.

Funds Needed for New Premises.

Gentlemen, if this Association is not to experience a serious check in its useful career, we must now apply ourselves heart and soul to settling the vexed question of new premises.

We must be prepared to collect the whole cost of building and equipment, and other expenses, a sum amounting (according to the two last building schemes gone into by the Premises Committee) to at least £15,000. This estimate allows nothing for luxury, but would provide merely a simple building well-designed to suit its purpose. The Committee believe they already see their way to something like £3,000 within the next three years. If every member of the Association would kindly undertake to collect (not necessarily to give) at least a guinea this session we should have made a start, without external help, to the extent of about £5,000.

Supposing our anticipations are realised so far, there ought to be no great difficulty in raising another £5,000 from other sources within the present session, and with £10,000 we might go forward in anticipation that a scheme so well inaugurated would be the best further appeal to the liberality of the profession and lovers of our art, and we might then reasonably expect to open our building free of debt within three years from the present date.

A Quotation from Martineau.

In concluding his address the President quoted at some length from Martineau, the substance of which is summed up in the following sentences relative to the architecture of the ancients: "the buildings devoted to the convenience of the body are for the most part gone; while those that represent ideas of the mind are standing yet. The provision for shelter, the places of traffic, the treasuries of wealth, the home of domestic life . . . have crumbled into the dust . . . but the temple answering to the sense of the Infinite and Holy, the rock-hewn sepulchre where love and mystery blended into a twilight of surmise; the column or the bust of civic praise, grateful for services to the commonwealth; these survive the shock of war and the waste of centuries, and testify that religion, love and honour for the good are inextinguishable."

Yet, as students, said Mr. Seth-Smith, we chafed under the long and patient training required to educate this high faculty, and as a class of artists we sometimes allowed our enthusiasm to suffer because national taste was so slow in developing. No one would deny that the art of the European Renaissance was a higher and nobler thing than that of the New Zealand Maoris, or assert that the art of Greece was produced in spite of the high intellect and civilization of that people. Let it suffice that we were progressing and that time must be allowed in proportion to the excellence of our art. To us belonged only the responsibility of doing our best by cherishing at all costs the highest ideas and cultivating our personal talents to their utmost capacity.

In moving a vote of thanks to the president for his address, Professor Beresford Pite congratulated the Association on the students' designs exhibited around them. Such work had vastly improved during recent years, and it was rather an important indication of what was being done in architecture, for many of the students who produced the designs were in the offices of well-known architects, whose work they reflected. He took exception to the last remark in the president's address, that we chafed under the long and patient training in design. The period of studentship was the happiest in the life of an architect, and he urged that unless the architectural student found real pleasure in his work it would be better for him to give it up. Every scheme of architectural education would fail if it did not engender enthusiasm in architecture is a fine art. Students should examine the buildings in their own district and cultivate enthusiasm for the great men—such as Cockerell or Burges, or the greater men of the Renaissance. They should never be satisfied with themselves. Undoubtedly, as had been said, an architect's best friend was his india-rubber, for the work rubbed out was always your best work. Mr. Francis Hooper, F.R.I.B.A., seconded the vote of thanks, which was carried with acclamation. The president replied, and the meeting then terminated.

New Patents.

These patients are open to opposition until November 18th.

1900.—Sewer Ventilation.—10,649. J. Maden, Macefield Villas, Old Hill, Staffs. A fan blower is employed to draw the gas out of the sewers and to force it up suitable conduits into the open air at a height where it can be discharged without giving offence. According to one modification, the fan is driven by a water-wheel actuated by the flowing sewage.

Condensation on Shop Windows.—17,835. A. C. Page, 66, Palatine Road, Stoke Newington, London, N. The window is constructed of two sheets of glass about 1in. apart. The air enclosed between acts as a non-conductor and prevents condensation.

Roller Blinds.—19,093. J. Adams, 28, Stanley Street, Bedford. Each end of the roller has a tightly-fitting adjustable cap with an indent or recess for the blind lath, which is first inserted in its hem, then laid on the roller, and there held by the caps.

Door Knobs.—20,097. T. H. Blenkin and S. G. Ward, 32 & 33, Cleveland Road, Wolverhampton. The knob is hollow, and has at its end a rubber ball or a pad of other soft material so that no damage is done to the wall should the door be violently thrown open.

Metal Troughs for Electric Mains.—20,197. M. Lachman, 29, Gillingham Street, London, S.W. The troughs are made of rolled sheet metal, and the side walls have their ends curled back on themselves. The lengths are connected together by metal clips driven on the two adjacent ends.

1901.—Motor Street-Sweepers.—1,704. J. T Collins, 238, Laurel Street, Hartford, Connecticut, U.S.A. This street-sweeper is self-propelled, and has an arrangement by which the traction wheels and the brush may be concurrently or independently rotated in opposite directions; means are also provided for spraying fluid in advance and at opposite ends of the brush.

The following specifications were published on Saturday last, and are open to opposition until November 25th. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1900.—12,935, Frame, Hickson & Goldie, ventilating rooms. 16,531, Jannetaz, double-acting hydraulic press for pressing and moulding artificial stone. 16,733, Gustorf, roofing tiles. 16,793, McDonald, brackets for flushing cisterns. 17,008, Lee, window. 19,750, Naylor, holding-down bolts. 20,678, Waine, door locks and latches. 20,874, Milo & Richardson, decorative treatment of wooden surfaces. 21,264, Taylor, grates for economising fuel and consuming smoke. 21,408, Taylor, draught-excluder for doors. 21,799, Sangwin, steps of buildings. 23,084, Knight, machine for laying bricks on buildings.

1901.—3,851, Kemp, Venetian blinds. 6,414, Barnett, fresh-air inlet for ventilating drains and sewers. 7,082, Dobney & Calah, holding sliding window-sashes. 7,286, Sharpe & Code, acetylene gas apparatus. 12,079, Woolhouse & Chrimes, automatic flushing apparatus. 13,013, Kramer, device for securing windows in an open position. 13,936, Bollé (*Pflaum & Gerlach*), sectional hot-water boilers. 16,025, Hörenz, combination ventilator and turbine driver. 16,504, Lloyd & Brooks, draw-off cocks and valves.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication

Clay-Modelling.

Northampton.—Goth writes: "I wish to learn clay-modelling so that I may better understand architectural details. Kindly name a book dealing fully with the subject."

There are several books that deal meagrely with this subject (there is a chapter on modelling in Millar's "Plastering: Plain and Decorative"), but the best and quickest plan is to get personal instruction. You can obtain much help, however, so far as design is concerned, from books on sculpture, such as Mitchell's "History of Ancient Sculpture" (Kegan Paul & Co.) and Gardner's "Handbook of Greek Sculpture" (Macmillan & Co., price 10s.).

Doric Order of the Temple of Theseus.

Newport.—Groudle writes: "In the Doric Order of the Temple of Theseus, Athens, does the centre of the triglyph come over the centre of the column?"

Yes.

Proportions of Tall Chimneys.

Devonport.—Beginner writes: "Please give formula (without trigonometrical functions) for calculating the thicknesses of a square chimney 90ft. high, 5ft. 6in. wide at the base and 3ft. 6in. at the top, to withstand a wind-pressure of 40lb. per sq. ft. It is to be built of bricks. Assume weight to be 110lb. per cub. ft."

If a tall chimney is made of the ordinary proportions it is usually strong enough without any special calculations. These proportions are 1-brick thick at top, and increased ½-brick in thickness every 20ft. down. Above 120ft. high the top length will be 1½-bricks thick. Cornice or cap not to project more than thickness of brickwork. Width of base to be at least one-tenth of height for square shaft and one-twelfth for circular shaft. Firebrick lining to be independent of brickwork of shaft, and to have 2in. space between. Interior sectional area to be uniform at each set off. Shaft to batter 2½in. in every 10ft. of height. For important cases full calculations should be made. For a square chimney 90ft. high the base must be at least 9ft. by 9ft., notwithstanding that if the top is 3ft. 6in. square outside a batter of 2½in. per ft. will only make the base at ground line 7ft. 3in. square; so that it is evident for this case the batter must be increased to 3¾in. per 10ft. on each face. HENRY ADAMS.

Cast-Iron Bridge Girder.

Sunderland.—Enquirer writes: "I understand that the shearing strain at any point in the web of a flanged girder is equal to the amount of load passing through that point to the support, and that the shearing strain due to a distributed load on a girder is nil at the centre and equal to half the total distributed load at each abutment. In designing a cast-iron girder, why is the depth of the girder diminished towards the abutment when the strain is greater and the flanges are the same throughout?"

The statement as to shearing stress is perfectly correct. In the case of the cast-iron parabolic bridge girder the flanges take the longitudinal stresses, or tension and compression, but being of uniform section the depth is reduced as ordinates to a parabola so that the stress throughout may be uniform. The web takes the shearing stress, but from practical considerations of foundry work it is necessary to make it much stronger than the stress requires. At the ends, where the depth to meet the longitudinal stress is nil, the sectional area of flanges alone is sufficient to provide for the shearing stress, but it is usual to give a depth of 6in. or 7in. for sake of appearance. HENRY ADAMS.

War Office Surveyors' Examination.

Devonport.—Beginner writes: "Would Twisden's 'Practical Mechanics' be a good addition to the library of anyone who intended entering for a Civil Service examination, such as that of surveyor to the War Office?"

Twisden's "Practical Mechanics" is a good book, but rather out of date; certainly no harm can be done by working through it, but many new terms have been introduced into mechanics since this book was written. Taylor's "Theoretical Mechanics—Solids" and Taylor's "Theoretical Mechanics—Fluids" (Longmans, 2s. 6d. each) will on the whole be found more suitable. Perry's "Practical Mathematics" (Eyre & Spottiswoode, 6d.) is an essential addition for all modern examinations. HENRY ADAMS.

Portable Stage.

Lancaster.—Anxious writes at great length and in a most illegible manner with reference to a portable stage, though it is particularly requested that correspondents should be as brief as possible; moreover, he gives an address which, when used, results in a letter being returned "Gone away." Considering the trouble which a reply to his enquiry involves, this is certainly a most discourteous method of making use of our columns.

So far as can be made out from this correspondent's eccentric writing he has to construct an open-air stage to be built of wood and used for acrobatic performances upon three days and then taken down, packed, and stored away for similar use in subsequent years. Although only used on three days it will of course need to be as strong as if used all the year round. The arrangement of framing at front of shelter may be as shown in Fig. 1, where A B is a space 10ft. wide, left level for attachment of trapeze, C D side-post, B E one strut or brace, F D another strut, and C G a third strut, all bolted through at G and also at the other ends. As the trapeze may carry three heavy men, say 5 cwt., and the load may be suddenly applied, making it double the points A and B will each have 5 cwt. But the beam may have the whole load of 10 cwt. occasionally applied at the centre, and there will be a distributed load of, say, 25 cwt., due to weight of structure, snow, wind, &c., or say an equivalent to a total of 60 cwt. in centre; and allowing a factor of safety of 6, the breaking weight should

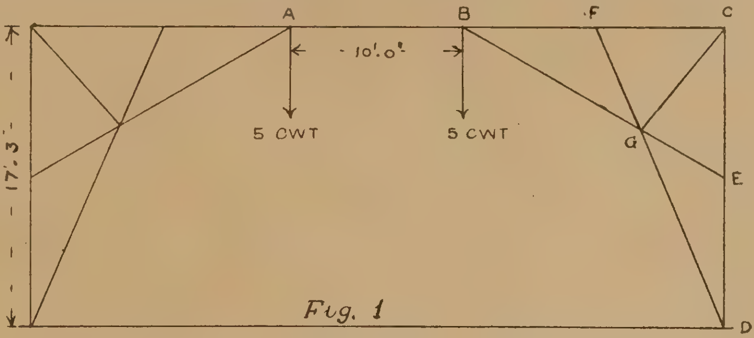


Fig. 1

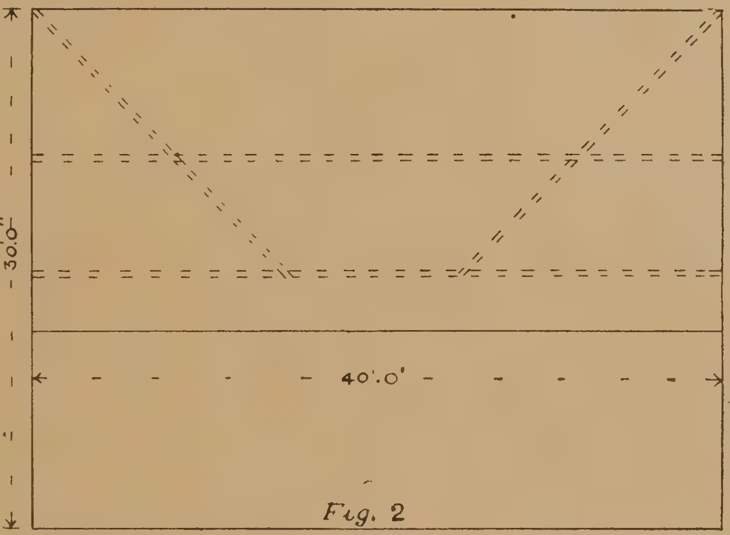


Fig. 2

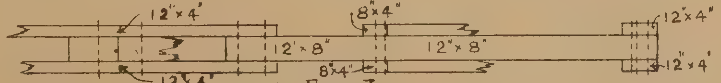


Fig. 3

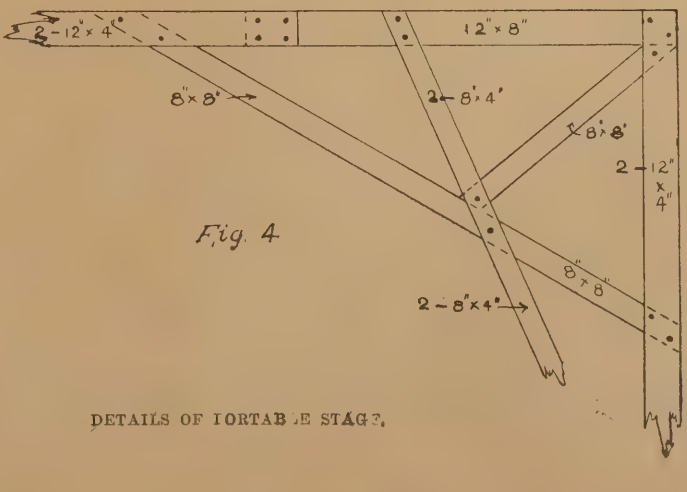


Fig. 4

DETAILS OF PORTABLE STAGE.

be 360 cwt. in centre. Then $W = \frac{cbd^2}{L}$, whence $bd^2 = \frac{WL}{c} = \frac{360 \times 10}{3\cdot6} = 1{,}000$, therefore say 12 × 8. The timbers of this frame may be arranged as shown in enlarged detail, Fig. 3. The sides and back of the structure will need cross-bracing, and the main beam and roof should be stiffened by timbers (see Fig. 2) notched under purlin and bolted at ends. The remainder of the work is ordinary architectural design for which a local architect may be consulted. HENRY ADAMS.

Making Architectural Models.

PARKSTONE.—TURPENTINE writes: "Kindly inform me how to make a pasteboard model of a house. Can I cut the roof and walls from two sheets of board only? Are there any books on the subject?"

Querist does not state to what scale he wishes to make his model or how high the building is; it is therefore impossible to say what size cardboard he requires. I would, however, suggest that he obtains a demy or royal Bristol board six-sheet or eight-sheet thick. The plan should be traced on paper or cloth and then stuck down around the outside edges on a board. The elevation should then be drawn straight on the Bristol board, coloured, cut out, and stuck carefully down to the outline tracing, care being taken to fix small pieces of wood or cardboard inside all the corners for strength. When the walls are all stuck up a knife should be run round the building, which should come off the board. The tracing paper or cloth can then be pulled away from the cardboard and the roof set up and glued on from the inside. Chimneys and ventilators should be cut out of wood, and paper pasted round them and coloured. The model will then be ready to be fixed down on a board, when the surroundings can be added, using green felt or baize for grass and colouring the ground for the paths, or gumming and sprinkling on fine gravel, waiting until it has dried before brushing off. The only book on the subject which I know of is "The Art of Architectural Modelling in Paper," by T. A. Richardson. It can be purchased of Messrs. T. A. Richardson, of High Holborn. JOHN B. THORP.

Cost of Roadmaking.

MANCHESTER. — MACADAM writes: "(1) What is a fair price for kerbing, flagging, channelling and tar macadamising a suburban road outside Manchester—how much per lineal foot or yard? (2) Has a district council power to charge what it likes for roadmaking of this character, and to accept any tender without consulting the property owners? (3) Can the district council add to the charge for roadmaking interest at the rate of 4 per cent on the total sum charged for roadmaking, the interest accruing against the property owners during the time taken in roadmaking, that time being long or short according to the whim of the district council? (4) Is not 17s. 6d. per yard an exhorbitant price for kerbing, flagging, channelling and tar macadamising a road in a new suburban district?"

(1) The prices of roadmaking materials depend very largely upon the locality and the facilities for obtaining them. The following prices, however, may be taked as approximate and serve as a guide:—

6in. by 12in. edge pennant curbing	5s. 8d. per yd. laid.
12in. by [illegible]in. flat granite „	6s. 6d. „ „ „
Flagging—patent Victoria stone	6s. 3d. per super. yd.
York stone flagging	6s. to 7s. „ „
Brick paving	3s. 6d. „ „
Tar pavement	3s. to 4s. „ „

according to local facilities for manufacture.

Channelling, if of 6in. by 4in. granite blocks on concrete, would cost about 16s. to 18s. per sq. yd. Channelling of 12in. by 4in. pennant stone costs about 3s. per yd. run. Tar macadamising (exclusive of foundation), 2s. 6d. to 3s. 6d. per sq. yd. run. Tar macadamising preparing foundation, from 3d. to 6d. per sq. yd. In the making-up of a suburban roadway under the Private Street Works Acts, the cost per ft. of frontage will depend, of course, entirely upon the works executed in the street and whether sewers are included, &c. Under ordinary circumstances, where there are no very exceptional works involved, the cost per ft. of frontage frequently ranges from about 9s. to 15s. for a road 50ft. wide. (2) With regard to the powers of a district council in the making-up of a "private street" (for we assume this is what our correspondent refers to), this depends upon the Act under which the authority is proceeding. The powers for making-up "private streets" are to be found in the 150th section of the Public Health Act, 1875, and in the Private Street Works Act, 1892, and to these reference should be made. Under the latter Act the authority has power to proceed to make up the street without affording the owners the option of doing the work themselves, as is provided in the Act first named. There is no obligation to consult the owners before accepting a tender. (3) By the Private Street Works Act, 1892, section 9 (2), it is provided that "the authority in any estimate of the expenses of private street works may include a commission not exceeding £5 per centum (in addition to the estimated actual cost) in respect of surveys, superintendence and notices." And again, by section 14 of the same Act, after the "final apportionment has been made, the owner stands charged with the sum due from him in respect of such works," together with interest at a rate not exceeding £4 per centum per annum from the date of the final apportionment till payment thereof." This interest does not commence until the work has been completed and the *final* apportionment has been served. (4) If our correspondent means 17s. 6d. per yard of frontage to the street, this price does not appear to us at all excessive for, say, a road 35ft. in width if works of curbing, channelling, roadmaking and paving have to be carried out; but it is impossible to give any definite opinion without knowing the class of work and material specified and the width of roadway, &c. W. H. M.

Dimensions of Assembly Hall.

HULL.—J. R. A. writes: "Which is the best way to calculate the dimensions of an assembly hall to seat a given number of people? Is there a book published dealing with this class of building?"

The usual allowance for seating accommodation is 1ft. 10in. wide by 2ft. 6in. from front to back per sitting, but a more reasonable size is 2ft. by 3ft. Including gangways, 7ft. super. should be taken as the unit. We do not know of any book specially dealing with the subject.

Tests for Lime and Cement.

BIRMINGHAM — COMPO writes: "Kindly mention a good simple test for the quality of lime and cement."

Test for limes:—Wet the lime; if it slakes in a few minutes with decrepitation and much heat, cracking and ebullition of vapour, it is a poor, feebly hydraulic, lime; if it shows no sign of slaking for an hour or more, then cracks all over with development of heat, but no decrepitation, it is hydraulic and very suitable for mortar; if it is very difficult to slake, and develops hardly any heat, with little or no cracking or powdering, it is eminently hydraulic. These varieties harden as follows: the first is firm in fifteen to twenty days, the second in six or eight days, and the last is firm in twenty hours and hard in two to four days. A rough test for cement was given on p. 245 of our issue for May 1st last.

Book on Timber.

BIRMINGHAM—BRAND writes: "Please name a good book on timber."

"Timber and Timber Trees, Native and Foreign," by Thomas Laslett (B. T. Batsford, 94, High Holborn, W.C.; price 7s.).

Wall Gardens.

RADLETT, HERTS.—GARDEN writes: "In your notice of Miss Jekyll's new book in your issue for September 11th you conclude the first paragraph by saying that in almost every locality stone can be easily obtained . . . . if not, chalk can be used. I should like to know (1) whether stone can be obtained anywhere in this county, and (2) whether chalk is suitable for building a bank at an angle of about 60 degs. with the ground, spaces being left for soil? Would not chalk crumble with rain and frost?"

(1) We do not know of any hard stone quarried in Hertfordshire, but in the chalk quarries a hard variety called clunch is found, and is very suitable for rock walls. In fact St. Albans Cathedral is partly built of material obtained from a hard layer at the top of the chalk marl, called Totternhoe stone. (2) The hard chalk we have named is suitable, and if built thick enough the rain and frost will not materially affect it for very many years. If, however, you do not care to use it you might use bricks for the rough-walled garden bank.

Cheap Tapestry for Wall Decoration.

LEAMINGTON.—Q. & C. write: "Where can we obtain the cheap tapestry seen in public billiard-rooms, &c.?"

Carlhian & Beaumetz, 73, Great Eastern Street, E.C.; E. Jullien, 2, Osnaburgh Terrace, Regent's Park, N.W.; A. H. Lee, 10, Oxford Circus Avenue, 231, Oxford Street, W.; Emile Pinchon, 3, Oxford Circus Avenue; J. W. Morris, 17, Berners Street, W.

Rendering Tank Watertight.

GREENOCK.—Q. T. writes: "A friend of mine has just completed a septic tank, which he has excavated in the grounds of a large mansion. The bottom and walls were lined with Portland cement—concrete 9in. thick and then finished with plastered cement—all good hard material; but he now finds that the water oozes away. Can you suggest any waterproof coating which may be put on with a brush, or can you suggest any remedy to make the tank watertight?"

We are unable to recommend any material or solution which is capable of application by means of a brush, so as to make this tank absolutely watertight. The most satisfactory remedy would be to line the bottom and sides of the tank with mastic asphalt, finished on the inside with a skin of brickwork 4½in. thick, and rendered on the face with cement. T. E. C.

TO READERS.—Within the last month no fewer than half a dozen letters have been returned to us through the Dead Letter Office when sent to the addresses given by correspondents who desired to make use of our "Enquiries Answered." We cannot understand why such false addresses should have been given, but we consider such action unworthy of anyone with a sense of ordinary courtesy.

Masters and Men.

The Swansea Builders' Labourers on Strike at a recent meeting discussed the latest terms of settlement offered, and decided that they would return to work on a farthing advance, to be given in May next, but declined to sign on for any terms of years as suggested.

Dundee Masons for Paisley.—A large batch of masons arrived in Paisley recently from Edinburgh and Dundee districts to take the places of the Paisley men, who are on strike. The masters stated that they expected an additional eighty men, and that so far as they are concerned the strike was at an end, as they had now as many masons as they have work for. The strike has lasted for fourteen weeks.

Blackpool Plasterers.—A compromise between the masters and employees has obviated a strike in the plastering trade. A month ago the employers gave notice of a reduction of a penny per hour in the rate of wages to be paid, thus bringing the standard down to 9d. Notice expired at the end of last month, and at a meeting of the two parties concerned the employees consented to accept a reduction of a halfpenny per hour. This was eventually agreed to by the employers.

The Bradford Dispute.—The Bradford Master-Builders' Association have had under consideration an offer from representatives of the masons now unemployed in consequence of the building trade dispute to recommend the men to resume work at ½d. per hour reduction, on condition that the masters did not insist on the rule that union and non-union men should work together. A reply was decided upon that the masters insist on non-union men and union men should work together, but they would permit any peaceful persuasion to be used by the men to induce the former to join the union.

Bricks and Mortar.

APHORISM FOR THE WEEK.

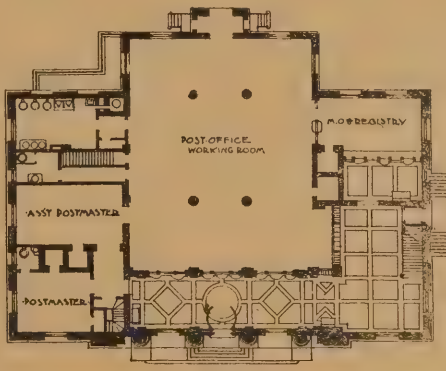
"*Work! Those who talk most know least.*"—
The late JAMES BROOKS.

Our Plates. THE post-office at Joliet, Illin., U.S.A., is an admirable piece of Classic work. Mr. James Knox Taylor, the supervising architect of the United States Treasury Department, has proved an exception to the general rule that nothing good in the shape of architecture can come from a Government department. We could wish that the same could be said of our own post-offices. The architects of the United States are producing much good work at present, due to the very complete training which students undergo at the several excellent schools (modelled on French lines) established in that country. Mr. Taylor in this post-office has wisely not attempted anything very original or brilliant, concerning himself chiefly with eliminating anything wanting in taste, and in consequence he has produced a most creditable and fine building. The planning is ornamental and workable, and strongly contrasts with what we are familiar with in this country.—The scheme for a Suffolk garden, by Messrs. Thomas H. Mawson, Dan Gibson and C. E. Mallows, explains itself.—Gordon House, Foley Street, W., consists of two flats on each floor, containing sitting-room, bedroom, kitchen, coal store, larder and w.c. The exterior is of picked stocks and red-brick facing, Portland stone and green coloured cement. Messrs. John Anley & Son, of Dalston, were the general contractors, and the sanitary works were carried out by Messrs. Thomas J. Boulting & Sons, of Union Street Middlesex Hospital. The architects are Messrs. H. Fuller Clark and Percy A. Boulting, of John Street, Bedford Row, London, W.C.

Cherbourg Stone. THE British Consul at Cherbourg states that there are several firms engaged in stone-quarrying there, all of whom appear to be doing well and show an ever-increasing business. The stone derived from the Cherbourg quarries is principally adopted for use as road metal; the stone is broken by hand, and is shipped mostly in British vessels to ports in the South of England, such as Poole, Shoreham, Southampton, Newhaven, Dover, Ramsgate, Margate, Herne Bay, Rochester, Stroud and the Thames. The stone shipped to these ports is termed screened, the stone being broken into pieces ranging from 1½in. to 2½in. in size. A slight misconception of terms should here be noticed, namely, that what is usually termed granite in England is at Cherbourg known under the name of quartzite, and it differs from the granite proper as found in the neighbourhood of Fermanville and Dielette in being much softer. A somewhat cheaper kind of stone is shipped to Llanelly and Bridgwater. The main trade is, however, in screened stone, and this export has shown a large increase during the last few years. The Cherbourg Quartzite Co., Ltd., shipped 34,000 tons, the Kent Road Maintenance Co. 55,483 tons, and other firms about 2,885 tons.

The Sutton Model Dwellings. THE trustees of the Sutton model dwellings scheme are looking for sites. Hitherto they have confined their quest to London, but their charter—the will of the late W. R. Sutton, carrier, of the City—permits them to buy land, which must be freehold or copyhold, in any populous place in England. Mr. Sutton left property worth more than £2,000,000. It yields about £80,000 a year, of which £13,000 is paid in the form of annuities to the testator's wife, brother (each of whom has an annuity of £5,000), sisters, nephew and some old friends and servants. The balance, and ultimately the whole, of the income is to be perpetually devoted to the erection and maintenance of dwellings for the poor. Perhaps its most remarkable feature is the provision that the dwellings must be let "below the full rents which could be obtained for the same." The trustees are told in the will that they may make the rents as low as they like, provided no person lives in a Sutton dwelling free of charge. Some months have passed since the death of the founder of the scheme, and people who knew of the will have been privately asking why there was no sign of preparations for the Sutton model dwellings. The reason is that three of the relatives of the deceased gentleman brought an action some time ago to set aside the testament as contrary to the Mortmain Act. Mr. Justice Buckley decided against them, and the scheme is safe, but it is not long since he did so. When the trustees have found a suitable site they will begin to build without delay, but all they do must be sanctioned by the Attorney-General.

The Ruin of Scottish Monuments. THE Glasgow Architectural Association held its first meeting of the session last week, when Mr. Charles E. Whitelaw delivered his opening address. The office-bearers for the session are: President, Mr. Charles E. Whitelaw; vice-presidents, Mr. William J. Blain and Mr. James Lochhead; hon. secretaries, Mr. Alexander N. Malcolm and Mr. William J. Lukeman; hon. treasurer, Mr. William Haldane; and hon. librarian, Mr. D. Bennet Dobson. After making a few remarks on the work of the Association during the past session, Mr. Whitelaw said that instead of, as customary, giving a paper of a general nature, he had chosen as a subject "The Disintegration of the National Ecclesiastical Monuments of Scotland." The lecturer divided his subject into three sections—first, the English Raids; secondly, the Religious Revolution; thirdly, the Period of Decay. Commencing with the period preceding the Reformation, the speaker referred to Henry the Eighth's failure to bring his nephew James V. of Scotland over from the Church of Rome, and to his starting a series of border raids covering from 1542–7, during which disastrous period all the border monasteries, with Holyrood Abbey and a great number of lesser ecclesiastical buildings, shared in the general destruction. He then referred to the Reformation in Scotland in 1543, during which many monasteries were pillaged, particularly those of Dundee, Perth and Aberdeen. Reliable information about this period was very scanty, but we could infer that the buildings themselves were not destroyed but, with the cathedrals, merely purged of the altars and offending images. The famous singing dome of St. Andrew's only existed in the imagination of a posthumous writer, the real cause being neglect and faulty construction. Mr. Whitelaw then spoke of the establishment of Protestantism in 1561. Scotland was very poor, never having recovered from the effects of the long-continued wars with England, hence we found the great churches, unable to maintain themselves, falling into partial ruin. The period of destruction and decay dated from the fifteenth century, when the vacant monasteries were pulled down by enterprising town officials to build tolbooths, &c.; by country lairds, to build mansions; and by farmers, to build steadings and dykes—a practice only checked during the Gothic revival in the first half of the nineteenth century.



PLAN OF UNITED STATES POST-OFFICE AT JOLIET, ILLINOIS. JAMES KNOX TAYLOR, SUPERVISING ARCHITECT.

MANCHESTER SOCIETY OF ARCHITECTS.

MR. ALFRED DARBYSHIRE'S ADDRESS.

THE opening meeting of the new session of the Manchester Society of Architects was held on Thursday evening last, Mr. Alfred Darbyshire (president) occupying the chair. In the course of his address the president said there might be present persons who, like himself, were fully aware of the conditions and who had not forgotten the difficulties which presented themselves to the man who elected to become an architect forty or fifty years ago. The student and the architect of the present day could have no knowledge of the state of the profession which existed in a provincial town like Manchester, and he offered his congratulations to those who were fortunate enough to have embraced the profession within the last quarter of a century. At the period of which he was speaking, the men practising architecture in Manchester were few in number and, he thought, all of them under the Classic influence. As a matter of course they were busy men, and could devote little attention to the education of their pupils. A time arrived, however, when that limited means of study ceased. The school of design became the school of art, the Academy of Fine Arts was established; they eagerly embraced the chances which these institutions offered, and which saved them from immolation on the altar of antiquity. In addition to these extra means of study, the Gothic revival set in and captivated them with its fascinating influence. They soon realised the fact that there was more in the development of architecture than could be got out of the "Five Orders," and that if their art was to rise to dignity and public appreciation it was to be by a cosmopolitan appreciation of the architecture of past ages and by collaboration with the sister arts of painting and sculpture. This was the condition of their art in this city about the middle of the Victorian era. Let them consider what had brought about the present state of prosperity, and the conditions under which it was now practised.

There appeared to him two marked and important causes for this change in architectural practice. The first of these causes was the determination on the part of architects to throw off the shackles of severe classicism. The second cause might be found in the increased opportunities for study outside the office walls. Schools of art arose, and the architect learned to become an artist. Public libraries were established, through which the student became a scholar, and, to crown all, a man arose who was to exhibit the beauties of Italian Renaissance in the streets of the city. Edward Walters struck the death-blow to the old school, which attempted to adapt Greek temples to town-halls, Quaker meeting-houses, concert-halls and infirmaries. He supposed there was scarcely to be found such an example in modern civic architecture where the whole character of a town had been so completely changed for the better by the genius of one man.

He went on to point out some of the defects in the practice of architecture of the present day. It was satisfactory to admit that improvement had taken place in recent years in the conduct of architectural competitions; but until competition was limited, each competitor remunerated, and the result adjudicated by a thoroughly competent and honourable architect, the system would remain incomplete and a scandal to our present state of civilisation. Although he entertained fixed and strong convictions on this matter, he would modify what he had said by this remark. If it were possible by the means he had mentioned to secure genuine and honest results, then any dormant talent might be developed and reputations made through the medium of competition. Genuine assessment was clearly the pivot on which such result was to be turned.

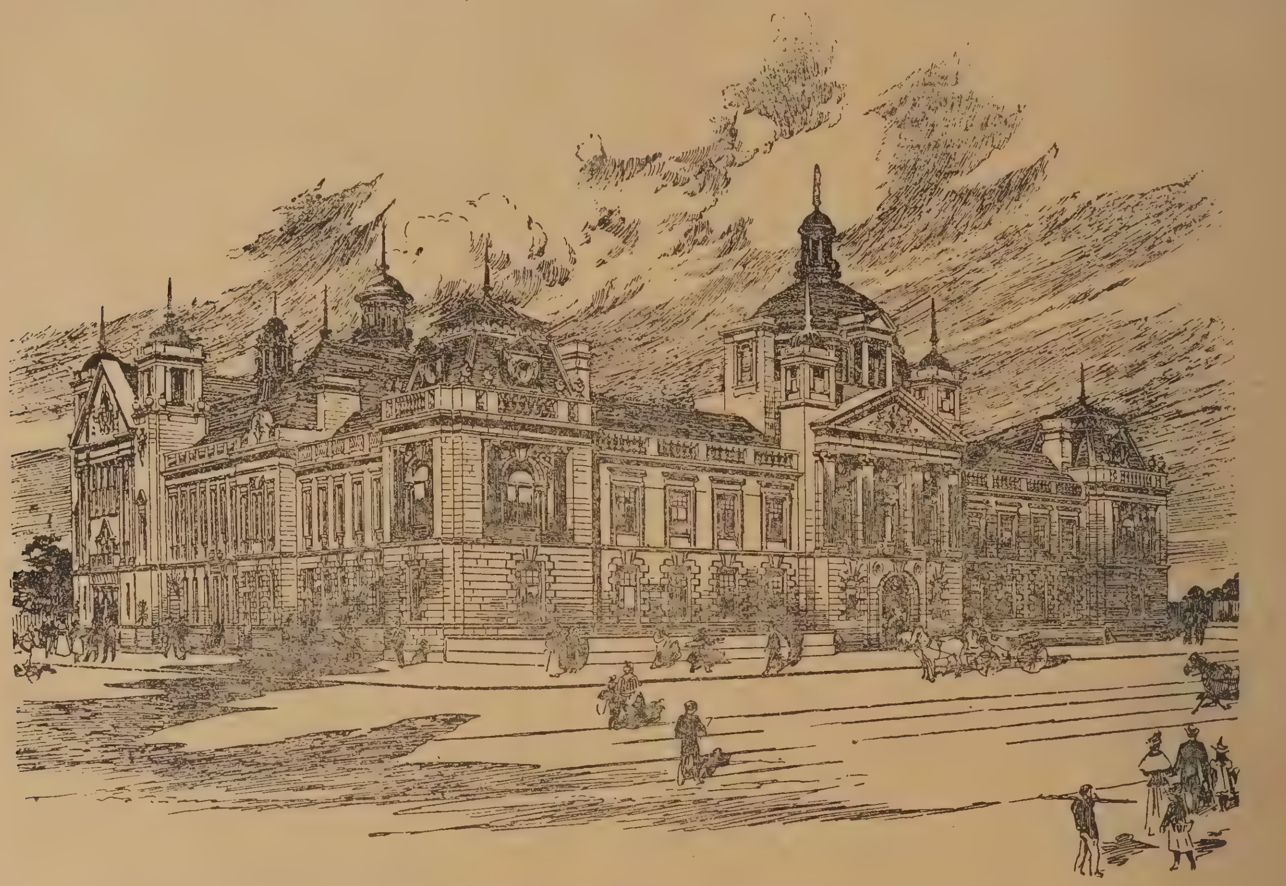
The members of this society were no doubt all cognizant of the fact that the Corporation of Manchester had determined to establish a municipal office of architecture, to be presided over by an official who was to be styled "The City Architect."

He fully appreciated the desire of the Corporation to appoint such an architect, and he would have him invested with power to condemn all ugliness and purely commercial street architecture; but it would be undesirable to place the future architecture of the city entirely in his hands. Such a decision would be the death blow to a variety of architectural treatment, and the future civic architecture would be "cribbed, cabined and confined" to one line of thought.

There was another matter which was of great importance to their local profession, and which required careful consideration. He alluded to the establishment of a Chair of Architecture at Owens College. The idea of a Professor of Architecture in connection with the University was not a new one. It had occupied the attention of some of the older members of the society for several years past, but it was only recently that the matter had assumed a practical form, and that steps had been taken towards the realization of an ideal, which he ventured to think would be of incalculable value to their profession in that city.

There was a point in connection with the practice of architecture to which he must briefly allude, and that was the collaboration of the architect, sculptor and painter where works were to be carried out in which an artistic ideal had to be realized, or where a symbolic decorative language had to be used on an architectural foundation. It had always seemed to him that although the architect provided the medium of artistic expression in his work, it was desirable that he should consult those who had to embellish it with high art adornment in sculptured or pictorial language—in other words, that proper preparation should be made for those sister arts which contribute so much towards the monumental character of architecture. He felt convinced that if a harmonious working together of the architect, sculptor and painter were made a rule instead of an exception, many mistakes would be obviated and grander results would be realized.

A New Evangelical Union Church at Glasgow is being erected at the corner of Dalmarnock Road and Harvie Street. It will provide accommodation for 605 persons, and is to be electrically lighted. Mr. J. C. M'Kellar, I.A., is the architect.



GOVAN MUNICIPAL BUILDINGS. THOMSON AND SANDILANDS, ARCHITECTS.

IS A NATIONAL IRISH ARCHITECTURE POSSIBLE?

THIS was the thesis of Mr. Charles MacCarthy's presidential address at the Architectural Association of Ireland last week. He was hopeful that the question could, and would, be answered in the affirmative. It was quite true that the present was an age most unfavourable to artistic development. Still, in spite of materialism the century just closed was not, even in the most material of countries, wholly unfavourable to other arts such as poetry and music. If such arts as these had been able to withstand the blighting influence of a philistine environment, why should they despair of architecture? Architecture, compared with some other arts, was, in some kind, a practical necessity.

Granted that a school of architecture was possible and necessary, it might still be asked, would not the attempt to make it national end in making it narrow and provincial? Was not all great art cosmopolitan? To the first of these questions the answer was an unqualified no; to the second a very qualified yes. Nationality and provincialism were as far asunder as the poles. As to cosmopolitanism in art, there too a confusion of thought existed. All great art must in its origin, its growth, its making, be instinct with the spirit of the country which had produced it, and, therefore, in the true meaning of the word, national. But there was a sense in which great art was cosmopolitan, for as soon as any nation had produced even one solitary work of really great art, that work belonged henceforth to mankind.

If he were asked to what branch of architecture he looked as holding forth the greatest promise of becoming the foundation of an Irish school, he would unhesitatingly say—to ecclesiastical architecture. It was to the Catholic Church, the church of the majority of Ireland, rather than to the State, the municipality or to private enterprise, that they must look for the material out of which a school of national architecture was to be created. But they could not conceal from themselves that church architecture in Ireland had fallen upon evil days. However much they might be disposed to blame the leaders of the Gothic revival in Ireland for having, under the influence of Pugin, adopted the English parish church as their model, instead of seeking inspiration from such beautiful examples of purely Irish work as were found in Cashel, Holy Cross, Cong and Kilkenny, still they must admit that they at all events were earnest men, and that their works were remarkable for beauty of design, honesty of intention and sound construction. Could they say as much of their church architecture of to-day? Was it not, on the contrary, too often characterised by the absence of every one of these qualities? Intricate in design, yet absolutely without interest, the majority of modern Catholic churches were nothing short of a disgrace to the country. Flimsy in construction, ill considered in plan and arrangement, made ridiculous by ill-placed senseless carving and pretentious but absolutely inartistic detail, these churches had been decorated internally in a manner of which literally he could not trust himself to speak.

Yet he did not despair. On the contrary he was filled with hope, because he believed that the lowest depth had now been reached and that when things had come to this pass they usually mend. But he had another and a brighter reason for hope. They must not forget that Ireland had a sound tradition of fine architecture, distinctively and peculiarly Irish; while in the decorative arts such as stone-carving and metalwork their pre-eminence in the past was almost universally admitted. He knew that it had been said that outside the early Romanesque work there was little or nothing distinctively Irish in their architecture, and that the Gothic work of, say, the thirteenth, fourteenth and fifteenth centuries was largely English. That was, however, an erroneous opinion, as was pointed out by Mr. James Ferguson. All the Gothic work in Ireland was, in fact, marked by what Mr. Ferguson called a foreign (that was, an un-English) character; while the cloisters of Muckross, Holycross and Kilconnell were, he said, more like those to be found in Sicily or Spain than anything in the British Islands.

Turning now to the present, he thought he could see the beginning of an art revival in Ireland. There was a movement around them which was national in the widest sense, a movement which had already given them that most astonishing revival of the Irish language, and a revival less marked, but very real all the same of music and literature. That this was certain to affect the artistic life of the country he for one could not doubt. If he were reminded that all this was largely a question of money, and that one could not afford to employ artists to paint the walls and windows or carve the capitals and string-courses of every country church, the answer was that half the country churches would be very much better without either carving or painting. If in future they left out the Carrara marble altar, with its bristling reredos, the vulgar stained-glass from Germany, and that impertinent carved oak pulpit from Belgium, and put the money into honest masonry instead, it would have cost them nothing, and they would have done a good stroke of work for architecture and for Ireland. It was to their architectural design that they should have to devote their attention in the first instance, if they honestly desired better things. As a first step on their road they must break with the evil practices of to-day, and then turning to the past of their own country for inspiration, let them study in the first place at least the simplicity and dignity so characteristic of their earlier Gothic buildings. Thus and thus only, he thought, could they hope to lay the foundation of a really national architecture.

At the above meeting the prizes won during the past session were distributed by the president, the prize-winners being as follows:—A.A I. travelling studentship, J. A. Rockett; Institute prize, Charles B. Powell; Beckett prize, L. O'Callaghan; class of design, 1st, W. Connolly; 2nd, J. K. Vinycomb and H. J. Leask (equal); class of building construction, 1st, H. Lundy, 2nd, W. Connolly; technical demonstrations, 1st, L. O'Callaghan; 2nd, H. J. O'Rourke; 3rd, F. Morley.

GOVAN MUNICIPAL BUILDINGS.

THE new town halls and municipal buildings erected at a cost of £48,000 by the Town Council of Govan were formerly opened last week. The site occupies a complete square; it is bounded on the north by Merryland Street, on the east by Govan Road, on the south by Summertown Road and on the west by Carmichael Street. The town hall extends along the entire west side of the block, the principal entrance to which is from Summertown Road by a three-arch doorway, leading through glass doors to the vestibule. There are two large corridors running parallel to each other along each side of the hall, which is entered from three different places. It is 90ft. long by about 60ft. wide, with an elliptical platform extending 14ft. into a recess at the north end. Immediately behind the platform Messrs. Norman & Beard, of Norwich, have built a four-manual organ, which will be worked by means of a 3 h.p. and 1 h.p. electric motor respectively. In the area there will be sitting accommodation for over 1,300 persons; while the gallery, which is reached by means of two main staircases leading from the vestibule, will seat over 1,000 persons. There are plenty of ante-rooms and lavatory accommodation, with specially-constructed ladies and gentlemen's cloakrooms; while a ladies' waiting-room and gentlemen's smoking-room are situated on the mezzanine floor. At the north end of the hall, and situated immediately to the rear of the platform, a suite of rooms have been set aside for the use of artistes taking part in concerts and other entertainments, access to which is gained by a separate door leading into Merryland Street. In addition to the main entrance there are two exit doors leading direct from the area of the hall to Carmichael Street. The lesser hall, which is situated above the borough treasurer's office, is entered from Summertown Road, and accommodates over 500 persons. There are also the usual ante-rooms and lavatory accommodation. In the sunk area there is a kitchen and scullery, with all the most modern appliances for cooking, &c., and from which easy access is gained to both halls. The eastern half of the block has been set aside for borough purposes, and offices have been provided for the town clerk, the sanitary inspector, the borough surveyor, the medical officer of health, and the inspector of weights and measures; while the council chambers are located immediately to the rear.

The architects of the buildings were Messrs. Thomson & Sandilands, of Glasgow; Messrs. Dansken & Purdie, of Glasgow, were the measurers; and Mr. Andrew Brown acted as clerk of works. The following were the contractors: Digger, mason, brick, steel and iron works, Thaw & Campbell, Glasgow; carpenter, joiner, glazier and ironmonger works, George Ferguson & Sons, Glasgow; slaters, James Cuthbertson & Son, Glasgow; plumber, John McFeat, Govan; plaster work, George Nicol & Son, Govan; carver work, James C. Young, Glasgow; sculpture work, A. McFarlane Shannan, Glasgow; heating and ventilating, James Boyd & Sons, Paisley; tile work, John Youden & Co., Ltd., Glasgow; grates and hearths, John Caird Parker, Glasgow; painter, John Hendry, Govan; electric lighting, R. D. Cassells & Co., Glasgow; mosaic and terrazzo floors, British and Italian Mosaic Co., Ltd., Glasgow; furniture, Wylie & Lochhead, R. Balfour & Son, and A. Gardner & Son, all of Glasgow; forms and chairs, Robertson's Furniture, Ltd., Glasgow; basement lighting, St. Pancras Ironwork Co.; electric motors and fittings for organ-gearing, King & Co., Leith; organ case, John Craig, Glasgow; ornamental iron gates and railings Singer & Co., Frome; stair railings and grills, George Adam & Son, Glasgow; and railings for town hall, T. & R. Adam, Govan.

We are enabled to publish the accompanying block through the courtesy of the "Glasgow Evening News."

Builders' Notes.

Granting Building Certificates.—At a meeting of the Accrington Town Council exception was taken by a member to a decision of the General Works Committee that certificates of completion of houses be not given unless they are finished in all respects in accordance with deposited plans, and where same have garden areas in front, unless the garden area walls and railings and garden threshold are fixed and finished off. He contended that the building by-laws were hard enough in Accrington already without imposing such a stringent restriction as this, and moved that the minute be referred back. The town clerk pointed out that in some cases garden walls and areas had not been completed for a considerable time after the houses themselves were finished, and people who had purchased houses had complained that they could not get them completed in accordance with the deposited plans. The amendment was lost.

Slump in the North Lincolnshire Brick Trade.—The men in the employ of Messrs. Turner Brothers, of Barrow Haven, recently received notice that operations would cease at the end of last week and the three yards belonging to the firm would be closed indefinitely. Owing to the slump in the brick trade very little manufacturing was done during the summer, and as a consequence there will be no necessity to dig clay during the ensuing winter. The direct effect of this state of affairs is that the men will probably flock to Hull in search of employment. Such a state of things has not occurred within the memory of the oldest inhabitant. Tile-making, a speciality of the firm up to a year or two ago, has entirely ceased, as well as the manufacture of ornamental finials and ridges. This is in a great part owing to the introduction of cheap foreign slates, mostly from Belgium. Another yard in the immediate vicinity has also practically ceased working, and the large stocks held by all the yards in the neighbourhood will have a disastrous effect upon the labourers during the winter. As before noted, this experience is unique at Barrow Haven, where up to the present year an accumulation of stock was unknown, the goods being readily bought as soon as manufactured. Although the dearness of material is no doubt partly responsible for the present state of things, another important feature must not be lost sight of, that during the last two or three years the output has been considerably increased by the establishment of new yards furnished with modern machinery. No fewer than eight new yards have been started between Barton and Grimsby during the last two years. This over-speculation was caused by the high price of bricks at the time, and the expectation of extensive buildings at Hull and Grimsby.

Engineering Notes.

A New Bridge over the Darwen has been erected at Walton.

Mr. E. Cruttwell, M.Inst.C.E., who, in conjunction with Mr. A. Murray, is carrying out the widening of London Bridge, has recently entered into partnership with the firm of Sir John Wolfe Barry & Partners, of 21, Delahay Street, Westminster.

A New Bridge over the Ythan at Auchedly is being erected. It is built on the site of the old Auchedly ford. The bridge will be a substantial stone structure, built after plans prepared by Mr. William Davidson, architect, the road surveyor of the district. Mr. Edgar Gauld, of Aberdeen, conducted the building operations, under the superintendence of Mr. Adam Scroggie.

The Main Section of the Croydon Electric Tramway, extending from Norbury to the borough boundary, was opened recently. The work, which it is estimated will cost altogether about £250,000, has been carried out by the Croydon Corporation in conjunction with the Callender Cable Co. The engines and cars have been supplied by the British Thompson Co., and the line has been leased by the Corporation to the British Electric Traction Co. for a period of twenty-five years, terminable every five years, the company paying 6½ per cent. interest on all capital outlay.

A New Bascule Bridge at Hull is being erected across the river Hull at Scott Street. It is expected to be in working order some time next year. The abutments and approaches are now being proceeded with. The bridge itself will be built of iron and steel. Crossing the river midway between North Bridge and Sculcoates Bridge, it is situated between Scott Street, Wincolmlee, on the west side, and Lime Street, Jenning Street and St. Mark Street on the east. It will be the means of bringing the east district in more direct communication with the Cannon Street Station of the Hull and Barnsley Railway, the north-west part of the city, and the numerous timber-yards, oil, flour and paint mills and works situate on the river-banks. The cost of the bridge, including the property acquired for the approaches, will be about £30,000. In connection with it is a subway for water, gas and electric mains. The Corporation have also obtained power by their Act of 1901 to construct a bridge across the river at Stoneferry, which will prove another means of communication between east and west, and will bring the number of bridges across the river up to six, five of which will be under municipal control.

THE FIRE AT STEPNEY CHURCH.

ON Saturday morning last a serious fire occurred at the ancient parish church of St. Dunstan, Stepney, a considerable part of the building being destroyed. About six o'clock the east end of the building was seen to be in flames, and though these were got under by eight o'clock the whole roof of the nave had been destroyed, only the skeleton of charred rafters remaining, stripped of its tile covering. The fire seems to have begun in the heating cellar, and thence to have run up the steps of the organ loft to the organ, which was completely destroyed. The débris of the organ falling on the altar, that was also burned, and the vestries were gutted. The roofs of the aisles, except about 5ft. at the organ end, are intact; the walls, floor, and seats of the church are practically uninjured; and the square tower at the west end, with its clock and bells, has not been touched. The great east window was much injured, and one other stained-glass window destroyed, but the parish registers, going back to 1568, and the silver-gilt church plate, of seventeenth-century work, having been kept in a large safe, have been preserved uninjured.

In 1485 the church was rebuilt, the fine old oak roof now destroyed dating from that time. The only parts of the present church which date back to before that rebuilding are the sedilia and an old stone crucifix, but these probably were not made earlier than the twelfth century.

The church was restored two years ago at a cost of £5,500. It contains many interesting monuments which have, fortunately, not been destroyed by the fire.

Keystones.

New Offices for the Felling Urban Council are proposed to be erected at a cost of about £8,000.

New Buildings at the West of England Eye Infirmary, Magdalen Street, Exeter, have been erected. They are built of bricks with Bath stone dressings. The cost is estimated at £18,000. They provide for fifty in-patients.

A New Town Hall at Alfreton has been opened. Mr. Frederick Lee, of Alfreton, was the builder. The building includes a county-court room and post-office. It is built of red bricks with stone facings. The hall has a seating capacity of 600.

Photography at Tintern Abbey Permissible.—We learn on the highest authority that the statement recently made that photographing at Tintern Abbey would not be allowed in future is absolutely without foundation.

A New Mission Church at Leeds has been erected in Pennington Street, Woodhouse Ridge. The building, which is named after St. Gabriel and will seat 360 persons, has been erected from the designs of Mr. G. W. Atkinson, at a cost of £1,450, exclusive of furnishing and site.

A New Church at Edmonton, to be dedicated to St. Michael, is being erected. The total cost of the building, which will occupy a prominent site adjoining the Mission Hall, within half a mile from Lower Edmonton Station on the Great Eastern Railway, is estimated at £12,000. Mr. W. G. Cave is the architect.

The New Buildings in connection with the Hounslow Polytechnic were opened recently. The extension was built by Messrs. George Challis & Co., of Brentford, from the designs of Mr. H. T Wakelin, county engineer and surveyor, at a cost of about £2,000. It comprises a new art-room 37ft. by 31ft., and accommodation for carpenters, plumbers and bricklayers' shops.

A Consumption Hospital Competition.—The committee of management of the North London Hospital for Consumption having asked five well-known hospital architects to compete for the erection of their proposed country branch and convalescent home at Northwood, Middlesex, have selected the design submitted by Mr. Frederick Wheeler, F.R.I.B.A., of 6, Staple Inn, W.C.

A New Temperance Hall at Birmingham has been erected near the top of Temple Street, and was formally opened by Mr. Chamberlain last Monday. The new structure is free Renaissance in style. It has been built of pressed red bricks with buff terra-cotta dressings. The gallery is similar to the dress circle in a theatre. It is so constructed that every person seated therein—and it can hold 450—can see the platform. The area of the hall can accommodate 550 persons. Messrs. Ewen, Harper & Co. were the architects.

The New Melville United Free Church, Aberdeen, is being erected on a corner site on the south side of Skene Street at its junction with Rose Street. The frontage to Skene Street is 68ft. and to Rose Street 160ft. The design is Classic. The architects are Messrs. Brown & Watt. The feature of the building is a campanile, rising to a height of 120ft. at the corner. The seating is arranged in horse-shoe form. The pulpit is placed at the west end of the church. There are narrow galleries at the two sides and a larger one opposite the pulpit. The interior walls of the area up to the gallery level will be panelled in woodwork throughout. The large hall extends along Rose Street and gives seating accommodation for about 400 persons, where it is intended to carry on the Sabbath school work. There is a small hall which will hold about 100 people, adjoining the larger hall, and the two can be thrown into one. The session-house will seat about forty. The two street elevations and the campanile are to be built of white Kemnay granite, having the dressed and moulded features close-picked and the plain wall surface faced with hammer-blocked Ashlar. The total cost of the buildings will be over £7,000. The contractors are as follow: Masonwork, Messrs. Pringle & Slessor; carpenterwork, Mr. Alex. Hall; slaterwork, Mr. George Farquhar; plasterwork, Messrs. Roger & Baxter; plumberwork, Mr. James Monro; painterwork, Mr. Edward Copland; heating engineers, Messrs. Shirras, Laing & Co.

A New Board School at Catford have been open in Holbeach Road. It provides accommodation for 314 boys, 314 girls and 318 infants.

Why every Architect and Builder should buy "Specification No. 5" is clearly explained in a brochure which has just been issued. It can be obtained from the publishers, 1, Arundel Street, Strand, post free.

A New Board School in Whitechapel was opened in Commercial Street last week. The new buildings will accommodate 900 children, and are lighted by electricity drawn from the Stepney borough mains.

A New Opera House at Tunbridge Wells is being erected at a cost of £30,000. It will have a seating capacity of 1,200. Mr. J. P. Briggs, of Effingham House, Arundel Street, Strand, W.C., is the architect.

Mr. H. Ascough Chapman, A.R.I.B.A., architect, of Leeds and Scarborough, has been appointed architect for the new group of buildings to be erected by the Leeds Corporation in Ashley Road, comprising a police and fire station, inspector's residence, single men's quarters, &c.

The Alfred Miller Institute, at Barnstaple, was opened last week. It has cost over £3,000 for building alone, and the total expenditure is over £5,000. There are large recreation- and reading-rooms for men and women. A concert hall affords accommodation for 300 persons. At the western end of the building is a clock tower.

A Sale of Furniture is now being held at the establishment of Messrs. Oetzmann & Co., of 62–79, Hampstead Road, W. They are offering a stock of furniture, china, glass, &c., together with carpets, rugs, curtains, &c., at a discount of 47½ per cent. for cash. A special illustrated catalogue is published in connection with the sale.

A New Church Hall has been erected in connection with Penicuik North United Free Church to accommodate about 200 persons. The hall, which was designed by Mr. R. Murray, George Street, Edinburgh, is of a style of architecture which harmonises with the church which it adjoins. The contractors were as follow: Masonwork, Mr. C. Lawson; joinerwork, Mr. James Tait; plumbing, Mr. T. Brown; slating, Mr. R. Dickson; painting, Mr. C. Wilson; heating, Messrs. Meikle & Philp, Edinburgh. The furnishings were supplied by the Bennet Furnishing Co., Glasgow.

A New Church of England Infant School has been erected at Newcastle-on-Tyne, in connection with the parish of Byker St. Anthony. The building is of red bricks with stone dressings, and is to be 73ft. long and 53ft. broad. There is a large schoolroom, which can be made into two by a movable partition, and a special classroom for cooking fitted up with gas stove and range. The school will accommodate about 200 children, and will be enclosed with a boundary wall and railing. The architect is Mr. J. Wightman Douglas, of Alnwick, and the contractor Mr. W. S. Anderson, Hunter's Road, Newcastle.

The Church of St. Botolph, Stow Longa, Hunts., dating from Norman times and containing work of all the succeeding centuries, was reopened recently, after rebuilding of the clearstory and nave and aisle roofs from designs by Messrs. John & S. Inskip Ladds, joint architects, of 7, Doughty Street, W.C. The new clearstory is based upon the fragments of the former one which were found during a previous restoration. It is of Early Perpendicular character and has been erected of Weldon stone by Mr. Henry Ashley, of St. Neots. The new roofs are of English oak, and have been executed by Messrs. Wrycroft & Sons, of St. Neots; that to the nave is of hammer-beam construction, and into the three middle principals the old tie beams of the late roof (which was of debased seventeenth-century character) have been framed. The roofs of the aisles are quite plain except at the eastern end of the south aisle, where a side chapel has an ornamental ceiling. The nave is covered with tiles, but the aisles with lead laid by Messrs. Peacock & Sons, of Huntingdon. A new wood block floor has been laid by Messrs. Goddard & Sons, of Farnham, Surrey; the glass is by Messrs. Pepper & Sons, of London, and the new side altar by Mr. Reid. The work has cost £1,150.

A New Suite of Halls and a Rectory for St. Mary Magdalene's Episcopal Church, Dundee, have been erected at a cost of £9,000, inclusive of the cost of the site.

The Advertisements on Dover Cliffs, against which for several years there has been carried on a strong public campaign locally and throughout the country, were removed last week. One of these signs alone contained no less than 4 tons of timber.

The Royal Albert Asylum, Lancaster, has been extended at a cost of £15,000. Special provision is made by the extension for epileptics, cripples and feeble patients, whose removal from the main block will enable the number of patients to be increased to about 800.

The Old County Hall in Spring Gardens, S.W., has recently undergone a complete renovation. The London County Council Chamber and all the committee-rooms have been decorated afresh, and a new system of electric lighting has been introduced into the former. Several structural alterations have also been made in the building, and a new corridor constructed on the east of the council chamber.

A New Sunday School has been erected in connection with the Unthank Road Baptist Church, Norwich. The architect was Mr. A. F. Scott and the contractor Mr. S. R. Wilkins. The building consists of a central hall, with gallery, nine classrooms and a room for the superintendent, and it is connected with the church by a covered corridor. The total cost of the building has been £1,800.

A New Public Hall at Jedburgh has been erected in Abbey Place at a cost of £6,000, and besides the large hall and gallery, in which about 803 people can be accommodated, there are a small hall for meetings, a drill hall and armoury for Volunteers, ante-rooms, cloak-rooms and other places. The principal frontage is 90ft. in length. The style is an adaptation of the later Renaissance period. Mr. James P. Alison, of Hawick, was the architect.

A New Congregational Chapel at Brislington has been erected on the main road at the corner of Wick Lane. The work, which has been completed by Messrs. W. Cowlin & Son, is a part only of the design furnished by Mr. Frank Wills. The plans provide accommodation on the ground floor and galleries for 812 persons, and with large schoolrooms at the side would cost about £8,000. The present portion of the building adequate for seating 385 persons has cost about £4,000.

A New Reredos at St. Michael's Church, Edinburgh, has recently been erected in the Lady Chapel. It is in late Gothic style, showing traces of German influence, and is decorated with colour and gold. When complete the niches will contains groups of figures. The carving was carried out, from designs by Mr. Hamilton More Nisbett, architect, by Mr. John Gibson, Haymarket; and the painting and colour decoration were done by Messrs. G. & H. Potts, Edinburgh. The cost was £145.

Fletcher's History of Architecture.—Mr. B. T. Batsford will issue early in November a revised and enlarged edition of "A History of Architecture on the Comparative Method," by the late Professor Banister Fletcher and Mr. Banister F. Fletcher. This edition has been revised and considerably enlarged by the junior author, and includes the Saracenic and Eastern styles. It now has 256 full-page plates, one-half being from photographs of buildings, the other from specially-prepared drawings of constructive and ornamental detail, including over 1,300 illustrations.

Ruskin's Birthplace.—The lease of No. 54, Hunter Street, Brunswick Square—where Ruskin was born in 1819—which belongs to the Foundling Hospital, having expired, the house is being completely renovated; and in order to give it a modern look the sashes of the front windows, which were in small squares, have been taken out and have been replaced by coarsely-moulded ones, glazed with inferior sheet glass in large squares, completely altering the character of the front of the house. This alteration will probably be followed by the removal of the delicate lead fanlight and the iron railings in front (as has been done elsewhere), and the transformation will then be complete.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Oct. 18	Hull—Underground Convenience	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 18	Cardiff—Cookery Kitchen	School Board	E. W. M. Corbett, Architect, Castle Street, Cardiff.
„ 18	Preston, Lancs—Repairing Roof of Market	Corporation	Borough Surveyor, Town Hall, Preston.
„ 18	Aberystwyth—Shop Premises	Miss Jukes	J. A. Jones, 7 Queen's Terrace, Aberystwyth.
„ 18	Isleworth—Additions to Nurses' Home	Brentford Union Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
„ 19	Sheffield—Baths and Library	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 19	Pontlottyn, Wales—School	Gelligaer School Board	James & Morgan, Charles Street Chambers, Cardiff.
„ 19	Newry—Rebuilding Workhouse	Guardians of Union	W. R. Bell, Clerk's Office, Workhouse, Newry.
„ 19	Bryncoch, near Neath, Wales—Six Houses	Main Colliery Company	J. C. Rees, Architect, Neath.
„ 19	Monmouth—School	Haberdashers' Company	Widnell & Trollope, 20 Tothill Street, S.W.
„ 21	Middleton—Shed and Workshops, &c.	Electric Traction Co., Ltd.	A. L. Barber, Secty., Donington House, Norfolk St., Strand, W.C.
„ 21	Armley, near Leeds—Boardroom, &c.	Guardians of Bramley Union	P. Robinson, 72, Albion Street, Leeds.
„ 21	Radcliffe, Lancs—Wall, &c.	Urban District Council	W. L. Rothwell, Surveyor, Council Offices, Radcliffe.
„ 21	Newquay, Cornwall—Schools, &c.	St. Colomb Minor School Board	J. Pearce, 1 Lehenver Villas, Newquay.
„ 21	London, W.—Bricks, &c.	Great Western Railway Company	Stores Superintendent, Swindon.
„ 21	Darlington—Two Public Urinals	Streets Committee	Borough Surveyor, Town Hall, Darlington.
„ 21	Eastbourne—Branch Library and Baths	Technical Instruction Committee	W. C. Field, Borough Architect, Town Hall, Eastbourne.
„ 21	Skegness—Pair of Cottages	Lindsey County Council	J. Thorp, 29 Broadgate, Lincoln.
„ 21	Yeovil—Show Room	Corporation Gas Committee	Offices, Gasworks, Yeovil.
„ 22	Plaistow—Double-tenement Houses	West Ham County Borough	Borough Engineer's Office, Town Hall, West Ham, E.
„ 22	Cardiff—Clergy House	Rev. H. A. Coe	Veall & Sant, Architects, Cardiff.
„ 22	London, N.W.—Additions to Infectious Diseases Hospital.	Willesden District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
„ 23	Abbotskerswell, Devon—Schoolmaster's House	School Board	S. Seagar, Architect, Union Street, Newton Abbot.
„ 23	Dublin—Alterations, &c. to Dispensary	South Dublin Union Guardians	J. P. Condon, Clerk, Board Room, James's Street, Dublin.
„ 23	Stockton-on-Tees—Alterations to Warehouse	Corporation	Borough Engineer, Borough Hall, Stockton-on-Tees.
„ 24	High Nibthwaite—Alterations, &c. to House	G. E. Moser	J. Stalker, 57, Highgate, Kendal.
„ 24	Fulbourn, near Cambridge—Wing to Asylum	—	A. P. Macalister, 20, St. Andrew's Street, Cambridge.
„ 24	Aston Manor—Public Urinal	Urban District Council	G. H. Jack, Engineer, Council House, Albert Road, Aston Manor.
„ 24	Nairn, Scotland—Semi-detached Villas	—	C. C. Doig, Architect, Elgin.
„ 25	Ancoats, Manchester—Stonebreaking, &c.	Joint Workhouse Committee	A. J. Murgatroyd, 23, Strutt Street, Manchester.
„ 26	Roscommon—Alterations, &c., at Infirmary	County Infirmary Governors	J. J. Sheil, Registrar, The Boardroom, Roscommon.
„ 26	Hebburn—Police Court	Durham County Council	W. Crozier, County Architect, Shire Hall, Durham.
„ 26	Southwick-on-Wear—Police Court	Durham County Council	W. Crozier, County Architect, Shire Hall, Durham.
„ 26	Thorpe-le-Soken, Essex—Alterations, &c., to Schools	—	C. E. Butcher, 2 Queen Street, Colchester.
„ 28	London, N.E.—Three Workshops, &c.	Governors of Hackney Institute	A. W. S. Cross, 58 Conduit Street, Regent Street, W.
„ 28	Gt. Northern Railway Co., Ireland—Houses, &c.	Directors	Company's Engineer, Amiens Street Terminus, Dublin.
„ 28	Belfast—Renewal of Roof over Station	Great Northern Railway Co. (Ireland)	Company's Engineer-in Chief, Amiens Street Terminus, Dublin.
„ 28	Brynteg, near Wrexham—Schools, &c.	Broughton School Board	R. J. Kendrick, 1 Henblas Street, Wrexham.
„ 28	Batley—Council Offices, &c.	Horbury Urban District Council	W. Hanstock & Sons, Architects, Batley.
„ 29	London, S.W.—Sub-District Post Office	Commissioners of H.M. Works	H. Tanner, H.M. Office of Works, Storey's Gate, London, S.W.
„ 30	Cheltenham—Town Hall	Corporation	E. T. Brydges, Town Clerk, Municipal Offices, Cheltenham.
	ENGINEERING:		
Oct. 18	Batley—Plant	Corporation	Lacey, Olirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 18	Darlaston—Reconstruction of Tramways	British Electric Traction Co., Ltd.	Chief Engineer of the Company, Donington House, Norfolk Street, London, W.C.
„ 18	Stourbridge—Tramways	British Electric Traction Co., Ltd.	Chief Engineer of the Company, Donington House, Norfolk Street London, W.C.
„ 18	Dundee—Electric Motors	Gas Commissioners	W. H. Tittensor, City Electrical Engineer, Dudhope Crescent Road, Dundee.
„ 18	Whitby—Wiring Electricity Works	Urban District Council	C. W. Kennaway, Electrical Engineer, Council Offices, Whitby.
„ 19	Annalong, co. Down, Ireland—Harbour Improvements	Down County Council	County Surveyor, Court House, Downpatrick.
„ 21	Youghal—Ventilating Apparatus	District Lunatic Asylum	H. A. Cutler, Municipal Buildings, Cork.
„ 21	Newport, Mon—Winches, &c.	Corporation	H. F. Parshall, 8 Princes Street, Bank, London, E.C.
„ 21	Cork—Heating, &c.	District Lunatic Asylum Committee	H. A. Cutler, Municipal Buildings, Cork.
„ 21	Blackpool—Tramway Extensions	Corporation	R. C. Quin, Electricity Works, West Caroline Street, Blackpool.
„ 22	Cardiff—Deepening Shaft	Elders Navigation Collieries, Ltd	Company's Offices at Cardiff.
„ 26	Blackburn—Engines, &c.	Water Committee	W. Stubbs, Municipal Offices, Blackburn.
„ 29	London, N.E.—Disinfector	Guardians of St. Matthew, Bethnal Green	D. Thomas, Clerk, Bishop's Road, Bethnal Green, N.E.
„ 29	Otley, Yorks—Reservoir, &c.	Urban District Council	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
Nov. 1	Edinburgh—Waterworks	Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
„ 2	Levenshulme—Refuse-destructor Installation	Urban District Council	J. Jepson, Surveyor, Levenshulme.
„ 12	Dartford—Pumping Machinery	Urban District Council	W. Harston, Surveyor, High Street, Dartford.
„ 23	Boulder City, Western Australia—Electric Tramway	City Council	Agent-General's Office, London.
„ 26	East London, South Africa—Electric Plant	—	Dyer & Dyer, 17 Aldermanbury, E.C.
Dec. 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb. 28.	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works, Sydney.
	IRON AND STEEL:		
Oct. 18	Lancaster—Cast-iron Water Pipes	Rural District Council	Surveyor, 5 Dalton Square, Lancaster.
„ 18	Preston—Cast-iron Water Pipes	Corporation	Borough Engineer, Town Hall, Preston.
„ 19	Coventry—Cast-iron Pipes	Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
„ 21	Ramsgate—Water Pipes	Corporation	W. A. M. Valon, Engineer, Ramsgate.
„ 21	London, W.—Ironwork and Tools	Great Western Railway Co.	Stores Superintendent, Swindon.
„ 23	Christiania—Rails, &c.	—	Railway Manager's Office, Christiania.
„ 29	Isleworth—Iron Escape Staircase	Brentford Union Guardians	W. H. Ward, Architect, Birmingham.
Nov. 1	Edinburgh—Cast-iron Pipes	Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
„ 11	London, S.W.—Rails, &c.	—	Agent-General for Victoria, 15 Victoria Street, London.
	PAINTING AND PLUMBING:		
Oct. 21	London, W.—Colours, Paints, &c.	Great Western Railway Co.	Stores Superintendent, Swindon.
Nov. 6	Christiania—Oils, White Lead, &c.	Norwegian State Railways Administration	Manager, Engineering Department, Christiania.
	ROADS AND CARTAGE:		
Oct. 19	London, E.—Barging away	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
„ 21	Hoddesdon, Herts—Kerbing, &c.	Herts County Council	U. A. Smith, 41 Parliament Street, S.W.
„ 21	Berkhampsted—Making-up, &c., Street	Urban District Council	E. H. Adey, Surveyor, Montague Road, Berkhampsted.
„ 21	Glasgow—Street Extension, &c.	Trustees of the Clyde Navigation	W. M. Alston, 16 Robertson Street, Glasgow.
„ 21	Sheerness—Materials	Urban District Council	T. F. Berry, Surveyor to Council, Trinity Road, Sheerness.
„ 23	Harlington, Hounslow—Making-up, &c., Roads	R. Newman	C. W. Manning, Surveyor, London Road, Ashford, Staines.
Nov. 1	Enfield, Middlesex—Footpaths	County Council	H. T. Wakelam, County Surveyor, Guildhall, Westminster.
„ 9	Ince, Lancs—Street Works	Urban District Council	Winstanley & Ashworth, 42 Deansgate, Manchester.
Nov. 30	Johannesburg—Pavements	—	"The Times," London, E.C.
	SANITARY;		
Oct. 23	Havana—Sewering and Paving	Municipality	Commercial Department, Foreign Office, S.W.
„ 25	West Hartlepool—Sewerage Scheme	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
„ 28	Newhaven, Sussex—Sewer, &c.	Urban District Council	F. J. Rayner, Town Surveyor, Newhaven, Sussex.
„ 28	Gosport—Sewers, &c.	Urban District Council	R. St. George Moore, 17 Victoria Street, Westminster, S.W.
	TIMBER:		
Oct. 19	Londonderry—Drainage and Plumbing Work	Union Guardians	M. A. Robinson, Architect, Richmond Street, Londonderry.
„ 21	London, W.—Telegraph Poles	Great Western Railway Co.	Great Western Railway Co., Stores Superintendent, Swindon.
„ 28	Selby, Yorks—Pipe Sewer	Rural District Council	B. McG. Gray, Town Surveyor, Town Hall, Selby.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 21	Leeds—Public Baths at Junction of Calveley and Broad Lanes, at cost not exceeding £8,000.	£30, £20, £10 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds.
" 21	Leeds—Public Baths and Branch Free Library in York Road, at cost of £15,000.	£50, £30, £15 [Limited to Local Architects].	W. J. Jeeves, Town Clerk, Leeds
" 26	Tadcaster—Sewage Works Scheme	£20.	Bromet & Son, 16 Park Row, Leeds.
" 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
" 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £10, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
Nov. 23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
" 23	Bexhill—Isolation Hospital	£25.	E S. Douglas, Town Hall, Bexhill.
1902. Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date	Tuam, Ireland—Drainage of Town	£50.	J. Daly, Acting Clerk, Rural District Council, Tuam.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ALDERSHOT.—For the erection of a new warehouse at Aldershot, for Messrs. T. White & Co., Ltd. Messrs. Friend & Lloyd, architects, Aldershot:—

Martin, Wells & Co.	£2,900
G. Kemp	2,789
W. Garland*	2,688
W. J. Snuggs	2,487

* Accepted. [All of Aldershot.]

CAERAU (near CARDIFF).—For the erection of a residence at Caerau, near Cardiff, for Colonel Sir Edward S. Hill, K.C.B. Mr. George E. Halliday, F.R.I.B.A., architect, Cardiff. Quantities by Mr. John W. Rodger, surveyor:—

W. Cox, Llandaff	£3,350	0	0
S. Shepton & Son	3,086	0	0
D. Thomas & Son	2,895	0	0
E. R. Evans Bros.	2,887	7	0
G. Couzens & Co.	2,737	7	6
F. Couzens & Co.	2,698	0	0
Britton, Barry Dock	2,660	0	0
A. W. Cadwallader*	2,610	0	0
F. Bevan, Penarth	2,431	0	0

*Accepted. [Rest of Cardiff.]

CARDIFF.—For supply, delivery, and erection of the steel and iron work required for (1) the widening of the Hayes Bridge, (2) the widening of the North Road Bridge, and (3) the reconstruction of the East Wharf Bridge, all within the county borough of Cardiff, comprising about 230 tons of steel girders, flooring, &c., and 25 tons of ornamental cast-iron parapets, &c., for the Corporation. Mr. W. Harpur, M.I.C.E., borough engineer:—

Heenan & Froude, Newton Heath, Manchester	£5,707	3	9
A. Handyside & Co., Ltd., Derby	5,545	10	0
E. Finch & C., Ltd., Chepstow	5,323	12	11
A. D. Dawnay & Sons, Ltd., London and Cardiff	4,967	15	1
W. A. Baker & Co., Ltd., Newport, Mon.	4,698	11	4
J. Westwood & Co., Ltd.,* Millwall, E.	4,366	14	5

* Recommended for acceptance by the Public Works Committee.

CARRICK MINES (Co. DUBLIN).—For the erection of a dwelling house and stable in steel and concrete. Messrs. Clare & Ross, A.R.I.B.A., architects, 1 West Street, Finsbury Circus, E.C., and Chelmsford:—

R. E. Mellon, Dublin	£2,144
A. Frazer,* Bray	1,900

* Accepted after amendment.

CHERITON (near FOLKESTONE, KENT).—For the widening and surface-water drainage of Risborough Lane, Cheriton, near Folkestone, for the Kent County Council. Mr. Frederick W. Ruck, county surveyor, Maidstone:—

W. Coker, Halling	£7 983	2	10
Tuff & Miskin, Rochester	7,447	16	6
Road Maintenance Co., Ltd., Gravesend	7,484	9	4
Arnold & Sons, East Peckham	7,135	9	6
Goodwin & Jeffery, Maidstone	6,355	0	0
Wallis & Sons,* Maidstone	6,228	0	0

* Accepted.

CROYDON.—For the erection of five houses and shops, Lower Church Street, Croydon. Messrs. Chart, Son & Reading, architects, Croydon:—

Truett & Steel, Thornton Heath	£3,079	0
Bacon & Co., Thornton Heath	3,034	10
E. J. Burnand, Wallington	2,956	0
G. Goulder, Croydon	2,875	0
Smith & Son, Croydon	2,698	0
Stewart & Sons, Wallington	2,612	0
C. Waller,* Croydon	2,548	0

* Accepted conditionally.

HASLEMERE (SURREY).—Accepted for the erection of a pair of shops with dwelling houses. Messrs. Clare & Ross, A.R.I.B.A., architects, 1 West Street, Finsbury Circus, London, E.C., and Chelmsford:—

W. Ranson, Haslemere	£1,197

IPSWICH.—For the construction of a new service reservoir to hold about 4,000,000 gallons of water, for the Waterworks Committee:—

H. Lovatt, Wolverhampton	£28,272	18	5
T. Oliver & Son, Rugby	28,118	5	5
H. J. Linzell	27,848	0	0
J. H. Vickers & Co., Ltd., Nottingham	27,184	0	0
Johnson & Co., London	26,430	10	0
G. Callender & Co., Westminster	24,046	5	6
G. Double	22,600	9	0
C. Wall, Chelsea	21,523	0	0
A. Coe	21,140	19	6
B. Cook & Co., Westminster	20,903	0	0
Moran & Son, Harwich	20,840	0	0
G. Grimwood & Sons	20,399	0	0
G. Bell,* Tottenham	19,807	0	0

* Accepted. [Rest of Ipswich.]

KIRKBY-IN-ASHFIELD.—For sewerage works, Pinxton Road, Church Hill and Skegby Road, for the Urban District Council. Mr. W. Dodsley, surveyor, 14 Stockwell Gate, Mansfield:—

J. H. Vickers	£1,968	0	0
Lock & Andrews	1,889	13	0
Lane Bros.	1,810	19	0
Hawley & Son	1,284	11	3
J. Lane	1,046	18	3
Tomlinson,* South Normanton, Alfreton	967	0	0

* Accepted.

LINCOLN.—For the erection of new chapel, South Bar, for the Deacons of the Lincoln Congregational Chapel. Mr. J. H. Cooper, architect, Lindum Road, Lincoln:—

W. Wright & Son	£4,912	0	0
Co-operative Society	4,789	0	0
Halkes Bros.	4,758	4	0
J. W. Cook, Branston	4,707	0	0
W. G. Brown, Leicester	4,365	0	0
W. & M. Halkes	4,322	3	2
F. Pattinson, Ruckington	4,309	16	0
H. S. & W. Close	4,300	0	0
S. & R. Horton	4,189	4	2
Mawer Bros.,* Louth	3,839	10	0

* Accepted. [Rest of Lincoln.]

LONDON, N.E.—For the erection of a portion of the new building, for the North-East London Institute, Dalston Lane, N.E. Mr. Arthur W. Cooksey, architect, 4 Adam Street, Adelphi, W.C.:—

Foster Bros.	£12,378	W. Wallis	£10,997
Pollard & Brand	12,270	Davis & Leaney	10,985
H. H. Hollingsworth	11,933	W. Shurmur	10,930
B. E. Nightingale	11,695	Sabey & Sons	10,895
Perry Bros.	11,657	Killby & Gayford	10,840
Josolyne & Young	11,350	G. Parker	10,830
H. L. Holloway	11,072	J. Chessum & Sons*	10,826
E. A. Roome & Co.	11,067	J. Appleby	10,790

* Accepted.

LONDON.—For fitting up kitchen department at the Joyce Green Hospital, for the Metropolitan Asylums Board:—

R. & A. Main, Ltd., Clerkenwell, E C.	£2,612	6	0
Clements, Jeakes & Co., Bloomsbury, W.C.	2,200	0	0
W. Summerscales & Sons, Ltd., Keighley	2,145	0	0
Benham & Sons, Ltd., Wigmore Street, W.	2,067	10	6
Wenham & Waters, Ltd., Croydon	2,009	0	0
J. & F. May, Lincoln's Inn Fields, W.C.	1,877	0	0
Moorwood, Sons & Co.,* Ltd., Sheffield	1,688	0	0

* Accepted. [Architect's revised estimate, £1,750.]

LONDON, S.E.—For private street works in Tremaine Road, for the Penge Urban District Council Mr. Herbert W. Longdin, surveyor:—

J. Mowlem & Co., Grosvenor Wharf, Westminster	£1,596	0	0
Bentham & Co., Telford Avenue, Streatham Hill	1,478	0	0
C. Pearce, Havelock Street, Forest Hill	1,466	19	5
G. Wilson & Co., Westbury Road, Walthamstow	1,458	0	0
Lawrence & Thacker, 41 Lavender Gardens, Clapham Common, S.W.	1,407	0	0
Woodham & Co., Sangley Road, Catford	1,208	7	11
Fry Bros.,* Lion Wharf, Greenwich, S.E.	1,189	18	2

* Accepted.

MAINDY (near CARDIFF).—For additions to schools at Maindy, near Cardiff, for the Llandaff School Board. Mr. George E. Halliday, F.R.I.B.A., architect, 14 High Street, Cardiff. Quantities by Mr. John W. Rodger, surveyor, Cardiff:—

W. Cox, Landaff	£1,489	12	10
Blacker Bros.	1,430	0	0
S. Shepton & Son	1,315	0	0
W. Symonds & Co.	1,303	18	0
A. W. Cadwallader	1,290	0	0
D. Thomas & Son	1,280	0	0
C. C. Dunn	1,230	0	0
G. Couzens & Co.*	1,187	0	0

* Accepted. [Rest of Cardiff.]

NOTTINGHAM.—For the erection of livery stables, Talbot Street and Wollaton Street, Nottingham, for the Nottingham Real Estate Investment Company, Ltd. Mr. Hedley J. Price, A.R.I.B.A., architect, 24 Low Pavement, Nottingham:—

J. Wright	£3,520	0
T. Barlow	3,475	0
J. H. Vickers, Ltd.	3,474	0
R. Fisher	3,396	10
J. Cooper & Son	3,290	0
J. Hutchinson & Son	3,270	0
F. Messom	3,218	0
J. J. Adams	3,150	0
J. H. Williamson & Co.	3,150	0
Dennett & Ingle	3,145	0
G. A. Pillatt	3,097	0
A. E. Smith	3,050	0
J. G. Short	3,027	0
W. Maule	3,010	0
W. Crane, Ltd.	2,9 3	0
T. Long*	2,830	0

* Accepted. [All of Nottingham.]

NOTTINGHAM.—For the erection of a warehouse in rear of Short Hill, Nottingham, for Mr. L. O. Trivett. Mr. Hedley J. Price, A.R.I.B.A., architect, 24 Low Pavement, Nottingham:—

Kerry & Co.	£2,950	W. Maule	£2,819
J. G. Short	2,927	T. & W. Lee	2,835
Dennett & Ingle	2,895	W. Crane	2,752
R. Fisher	2,891	F. Messom*	2,690
G. A. Pillatt	2,880		

* Accepted. [All of Nottingham.]

PLYMOUTH.—For the erection of new schools at Salisbury Road, Plymouth, for the Plymouth School Board. Mr. H. J. Snell, architect, 11 The Crescent, Plymouth:—

H. E. Skinner	£27,462	Tozer & Son	£25,083
A. R. Lethbridge	26,063	Wakeham Bros.	24,373
Pearn Bros.	25,789	Lapthorn & Co.	24,268
T. May	25,655	Allen & Tozer	24,000
J. H. Blackell	25,630	A. Andrews	23,780
J. Cockerell, Devonport	25,397	J. Partridge	23,427
		W. E. Blake*	22,447

* Provisionally accepted. [Rest of Plymouth.]

READING.—For the following works in the King's Meadow recreation ground, for the Corporation; (Section A) construction of ladies' swimming-bath; (B) erection of lodge and conveniences. Mr. John Bowen, M.I.C.E., borough engineer and surveyor:—

Swimming-bath.			
H. W. Godwin	£7,399	0	0
Collier & Catley	6,550	0	0
Pattinson & Sons, London	6,169	0	0
McC. E. Fitt	5,655	0	0
H. Hill,* Maidenhead	4,627	0	0
Caretaker's lodge and sanitary conveniences.			
H. Searle	1,397	0	0
J. Dixon	1,377	12	10
H. W. Godwin	1,342	0	0
W. Pattinson & Sons	1,301	0	0
Collier & Catley	1,294	11	0
G. S. Lewis & Bro.	1,240	0	0
McC. E. Fitt*	1,234	0	0

* Accepted. [Rest of Reading.]

RUSHDEN (NORTHANTS).—For the erection of fire station and cottage, Newton Road, Rushden, for the Rushden Urban District Council. Mr. W. B. Madin, C.E., town surveyor:—

H. Sparrow	£1,805	0
Whittington & Tomlin	1,635	0
Hacksley Bros., Wellingborough	1,590	0
T. Wilmott, jun.	1,588	10
R. Marriott, jun.	1 585	0
C. E. Bayes*	1,575	0

[Rest of Rushden. Surveyor's estimate, £1,635.]
* Accepted.

ST. ALBANS.—For the erection of a detached house, Russell Avenue, Spencer Park, St. Albans, for Councillor James Flint. Mr. H. E. Hansell, architect, Station Buildings, St. Albans:—

C. Miskin & Sons	£850
E. Dunham	792
J. T. Bushell*	695

* Accepted.

ST. ALBANS.—For the erection of offices and stores, Grimston Road, St. Albans, for Mr. G. Alfred Pratt. Mr. H. E. Hansell, architect, Station Buildings, St. Albans:—

E. Dunham	463	0	0	W. Stevens & Sons	332	0	0
W. Sharp	430	0	0	W. Goodchild & Sons*	279	8	6
H. J. Skelton	375	0	0				
J. Andrew	362	0	0				

* Accepted.

ST. ALBANS.—For the erection of a house and shop at corner of Hatfield and Laurel Roads, St. Albans, for Mr. F. W. Fox. Mr. H. E. Hansell, architect, Station Buildings, St. Albans:—

H. J. Skelton	£800
W. Sharp*	775

* Accepted.

SANDRIDGE.—For additions to school house for the Sandridge School Board. Mr. H. E. Hansell, architect, Station Buildings, St. Albans:—

W. Sharp	£225	0
H. J. Skelton	195	0
W. Sparrow	192	15
Goodchild & Sons	187	10
Vail & Co.*	169	10

* Accepted.

SOUTHEND-ON-SEA.—For the erection of three shops for Mrs. Ruth Brunt. Mr. A. Cayton, architect, Southend:—

A. Woodiwiss, Southend	£1,095	0	0
J. H. Bosworth, Leigh	1,080	9	0
A. J. Golding,* Southend	997	6	8

* Accepted.

WARE.—For the erection in steel and concrete of a gardener's cottage. Messrs. Clare & Ross, A.R.I.B.A., architects, 1 West Street, Finsbury Circus, E C. and Chelmsford:—

H. Norris & Son, Hertford	£656
F. Hitch, Ware	645
Foster & Dicksee, Rugby	490
F. Johnson, Chelmsford	430
Clare Bros.* Stratford	397

* Accepted.

WARE.—For the erection of a house at Ware for Mr. A. L. Ashwell. Messrs. R. & A. G. Thorowgood, architects, Ware and Hertford:—

Brown & Son, Braintree	£1,603	0
Clark, Hoddesdon	1,397	15
Long, Puckeridge	1,120	0
Green, Bengeo	1,081	10
Copsey, Ware	935	0
Shephard, Hertford	925	0
Lawrance, Ware	918	10

WEST HAM.—For making up the following streets, for the Corporation of West Ham: Claude Road, Bishop's Avenue, Lawrence Road, Donald Road, Gwendoline Avenue, Churston Avenue, Lucas Avenue, Thorngrove Road. Mr. J. G. Morley, borough engineer:—

O. R. Anstead, 93 Wakefield Street, East Ham	£7,547	19	9
W. Griffiths, Ltd., Hamilton House, Bishopsgate Street, E.C.	6,956	16	1
T. Adams, Green Lanes Goods Station, Wood Green	6,756	2	3
J. Jackson, Broadway, Plaistow	6,498	11	0
D. T. Jackson,* 101 Ripple Road, Barking	6,210	0	0

* Accepted.

WEST HAM.—For the construction of an underground sanitary convenience, Sebert Road, Forest Gate, E., for the Corporation of West Ham. Mr. J. G. Morley, borough engineer:—

G. North, Manbey Road, Stratford	£2,010	0	0
J. W. Jerram, Boundary Road, East Ham	1,950	0	0
G. Wise, works manager, West Ham	1,914	0	0
G. Jennings, Ltd., Lambeth Palace Road	1,909	13	2
Gregar & Son,* Jupp Road, Stratford, E.	1,866	0	0

* Accepted.

WHITLEY.—For the construction of about 2,414 lineal yards of 12-in., 15-in., and 18-in. earthenware pipe sewers, about 1,038 lineal yards of 18-in. cast-iron pipes, manholes, flushing tanks, and other works comprised in the new sewerage works in the districts of Whitley and Monkseaton, for the Whitley and Monkseaton Urban District Council. Mr. J. P. Spencer, A.M.I.C.E., consulting engineer, 30 Howard Street, North Shields:—

Section 1.			
J. & W. Simpson, North Shields	£8,150	0	0
G. E. Simpson, Newcastle	6,849	16	8
W. Dykes, Cullercoats	6,831	15	6
W. & J. Lant, Newcastle	6,719	16	8
G. Bell, Manchester	5,348	13	7
T. & J. Maclaren, Gosforth	5,256	14	0
R. Hudson & Sons, Sunderland	5,150	0	0
W. Craig, Gateshead	5,142	4	8
C. Thornton & Co., South Shields	4,900	17	7
W. Carr, Gosforth	4,735	16	10
J. Thompson, Gosforth	4,295	10	0
R. & J. Thompson, North Shields	4,049	13	10
J. & R. Johnson,* Whitley	3,932	3	0
Section 2.			
J. & W. Simpson	£6,685	0	0
G. E. Simpson	6,420	0	0
W. Craig	6,325	14	9
W. Dykes	5,908	10	0
T. & J. Maclaren	5,591	12	0
G. Bell	4,647	17	2
C. Thornton & Co.	4,617	18	10
W. & J. Lant	4,565	18	11
R. Hudson & Sons	4,486	0	0
J. Thompson	4,198	15	9
W. Carr	3,741	9	4
J. & R. Johnson	3,667	18	3
R. & J. Thompson*	3,106	10	3

* Accepted.

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* * *

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Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 11 0	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do	1 0 4½	—
Linseed Oil, barrels ..	do	1 11 0	1 11 3
Petroleum, American ..	per gal.	0 0 6¾	0 0 6⅞
Do. Russian ..	do.	0 0 6¼	0 0 6⅜
Pitch	per barrel	0 7 6	—
Shellac orange	per cwt.	4 17 0	—
Soda, crystals	per ton	3 2 6¼	3 5 0
Tallow, Home Melt ..	per cwt.	1 8 6	—
Tar, Stockholm	per barrel	1 4 6	—
Turpentine	per cwt.	1 6 9	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	80 0 0	—
Iron, Staffs., bar ..	do.	6 15 0	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 15 0	12 0 0
Lead, pig, Spanish ..	do.	11 12 6	11 15 0
Do. do. English common brands	do.	12 2 9	12 5 0
Do. sheet, English 3lb per sq. ft. and upwards	do.	12 15 0	—
Do. pipe	do.	13 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	6 15 0	—
Do. floor brads	do.	9 10 0	—
Steel, Staffs., Girders and Angles	per ton	5 15 0	6 15 0
Do. Mild bars	do.	6 0 0	6 15 0
Tin, Foreign	do.	114 0 0	114 10 0
Do. English ingots ..	do.	117 10 0	—
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	17 2 6	17 7 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fur, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec, Yellow ..	do.	4 7 6	6 0 0
Do. Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P. Std.	9 10 0	10 15 0
Do. do. 4th & 3rd	do.	8 10 0	10 0 0
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	13 15 0	14 10 0
Do. do. 2nd „	do.	15 10 0	—
Do. do. unsorted	do.	10 5 0	—
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	do.	8 0 0	10 15 0
Do. White Sea ..	do.	8 5 0	13 15 0
Do. Quebec Pine, 1st ..	do.	15 5 0	—
Do. do. 2nd ..	do.	11 5 0	—
Do. do. 3rd &c.	do.	9 13 0	—
Do. Canadian Spruce, 1st	do.	10 0 0	11 15 0
Do. do. 3rd & 2nd	do.	8 0 0	10 0 0
Do. New Brunswick	do.	7 5 0	8 0 0

TIMBER—*cont.*

		£ s. d.	£ s. d.
Battens, all kinds ..	do.	4 2 6	7 5 0
Flooring Boards 1in. prepared, 1st ..	per square	0 10 0	0 12 0
Do. 2nd ..	do.	0 9 6	0 10 6
Do. 3rd &c. ..	do.	0 9 0	—

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba ..	per ft. sup.	0 0 4 5/32	—
Do. Honduras ..	do.	0 0 4 3/32	—
Do. Tobasco	do.	0 0 3¾	—
Elm, Quebec	per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 4 1/32	—
Do. African ..	do.	0 0 3	—
Do. St. Domingo	do.	0 0 6¾	—
Do. Tobasco ..	do.	0 0 3 29/32	—
Do. Cuba ..	do.	0 0 5 13/32	0 0 5 13/16
Oak, Dantzic and Memel	per load	3 15 0	5 7 6
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ..	do.	6 0 0	17 10 0
Wainscot, Riga (Baulk)	do.	3 15 0	5 15 0
Do. Odessa Crown	do.	3 15 0	5 15 0
Walnut, American ..	per cub. ft.	0 3 1	—

COMING EVENTS.

Wednesday, October 16.

SANITARY INSTITUTE.—Conference on Water Supplies and River Pollution, St. Andrew's Hall, Newman Street, W.; First day. (Lectures and Demonstrations for Sanitary Officers: Part I.)—Mr. W. Spinks, A.M.I.C.E., on "Sanitary Appliance," 7 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Annual Smoking Concert at the Grosvenor Hotel, Westland Row, Dublin, 8 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Quarterly Meeting of the Members, 8 p.m.

Thursday, October 17.

SANITARY INSTITUTE.—Conference on Water Supplies and River Pollution; Second day. Dinner at the Holborn Restaurant, 7.30 p.m. (Lectures and Demonstrations for Sanitary Officers: Part I.)—Mr. W. Spinks, A.M.I.C.E., on "House Drainage," 7 p.m.

CARPENTERS' COMPANY, Carpenters' Hall, London Wall, E.C. (Lectures on Sanitary Building Construction).—Mr. Mark H. Judge, F.R.I.B.A., on "Sanitary Architecture," 7.30 p.m.

Friday, October 18.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—Mr. H. Gregory Collins on "Stables and Stable Fittings," 7.30 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Professor F. W. Burstall on "Second Report to the Gas-Engine Research Committee," 8 p.m.

Monday, October 21.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Exhibition of Prize and Class Drawings for Past Session, in Rooms of the Royal Institute of Architects of Ireland, 20, Lincoln Place, Dublin. Remains opens till 26th. 10 a.m. to 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Fletcher T. Turton on "Cheap Dwellings," 6 p.m.

Tuesday, October 22.

ARCHITECTURAL ASSOCIATION OF IRELAND (20, Lincoln Place, Dublin).—Mr. R. C. Orpen on "Furniture and Fittings," 7.45 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. Henry Robinson, M.I.C.E., on "Water Supply: Sources of Supply and Distribution." 7 p.m.

Wednesday, October 23.

ASSOCIATION OF MUNICIPAL CORPORATIONS.—Autumn General Meeting, Westminster Palace Hotel, 11 a.m.

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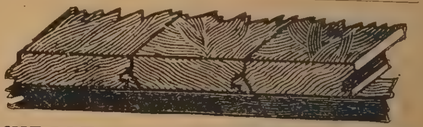

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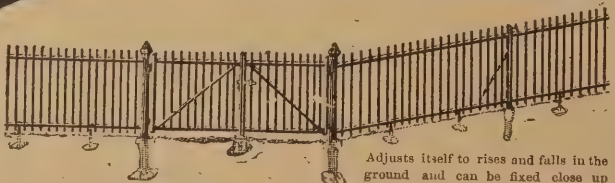

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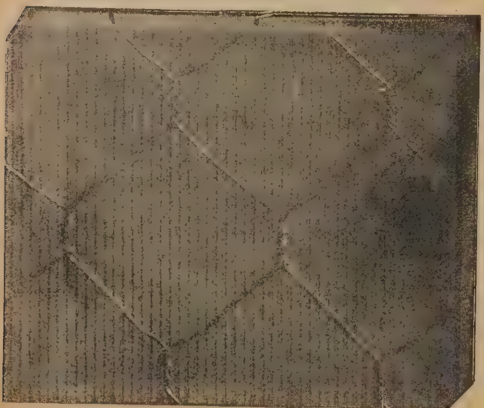

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

OCT. 23, 1901.
No. 350.

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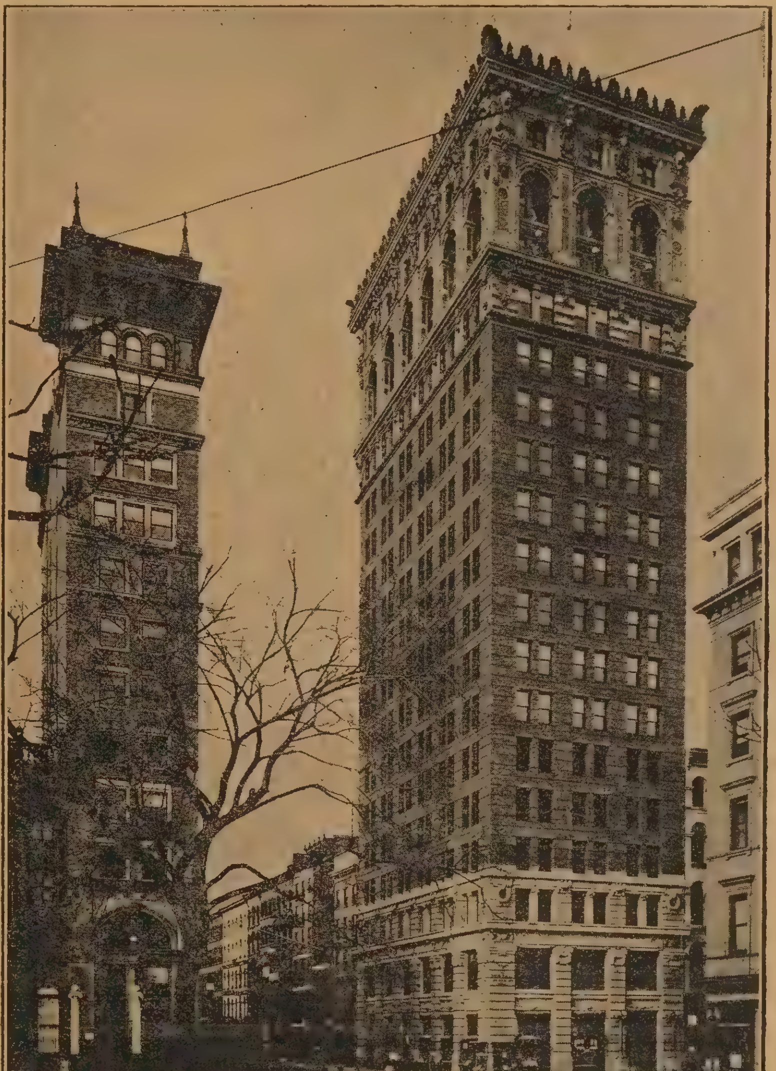
An Architectural Causerie.

Insecure Balconies. SOME time ago we took occasion to refer to the senseless practice of providing balconies which will never be used, or are so small that they can be put to no better purpose than holding flower-pots. Last week a more serious matter concerning balconies came before the Manchester City Coroner. On the occasion of Lord Roberts's visit to the city, a certain small balcony on the first floor of No. 66, Deansgate was occupied by three ladies, for whom the stonework was covered by some paper held down by weights. Whilst a clerk was removing the last of these weights, after the procession had passed, the stone capping of the balustrade slipped and fell into the street, killing a girl. There was nothing to hold the stone in position (though it certainly should have been dowelled), and it is surprising that it remained in place so long, for the balcony was built more than twenty-five years ago. At the inquest the coroner said that if the accident had happened within a short time of the fixing of the stone he would not have hesitated to advise the jury to commit the responsible person for trial on a charge of manslaughter: and he pointed out that owners of property frequently neglect to see whether balconies and similar parts are safe or unsafe. As the coroner very justly remarked, they should not be allowed to come into a court and say, "I did not know it was dangerous." If they had examined it they would have found it out. In this particular case a verdict of "Accidental Death" was returned, but the owners of the property are certainly morally culpable for neglecting to ascertain that the balcony was unsafe. The case should prove a warning to others.

Liverpool Cathedral. MR. REGINALD BLOMFIELD and Mr. Robert Gladstone have had a thorough tussle in regard to Liverpool Cathedral. The dispute about what the style should be is, however, of no particular consequence, though it forms instructive reading. It is the fact that "Gothic" should have been stipulated as the *only* style which draws down the outburst on the heads of the Executive Committee. And so long as there is any chance of getting such an unjust and unwise restriction altered, so long should every voice be raised in protest.

Something in the City. THERE was much righteous indignation at last Thursday's meeting of the Court of Common Council with regard to the constant upheaval of the streets, but we fear that little good will result from the resolution to the Streets Committee to consider the desirability of obtaining further Parliamentary powers. The Post Office and the water, gas, and electric light companies have turned the streets into such a chaos that on several occasions it has been much quicker to walk from the Strand to London Bridge rather than to venture on a 'bus or in a cab; yet, however zealously the Corporation exercise their powers under the Sewers Act of 1848, and even assuming that additional Parliamentary powers are obtained, it is not likely that any radical improvement will be effected; for it is subways that are needed, and until these are provided—though at a necessarily great initial expenditure—we shall always be harassed by the workmen who mark out little claims for themselves in the middle of Fleet Street, and leisurely dig and scrape to the accompaniment of a plethora of human abuse. Another interesting matter discussed at last Thursday's meeting was that concerning the safety of St. Paul's Cathedral. The facts about the disturbances caused by underground tunnelling have already been published in these columns, and they clearly prove that, though no serious subsidence has yet taken place, if the fabric is to remain secure there must be no more "tubes" in the immediate vicinity—the Central London Railway on the north is only 460ft. from the centre of the dome, yet the new line from Piccadilly proposes to come 160ft. nearer! The Dean and Chapter will do all they can by opposing the Bills; but is it not ironical that, while money is being wasted inside on foreign decorations, there are no funds available for structural works to assure the safety of the cathedral—not even enough to keep the building in thorough repair!



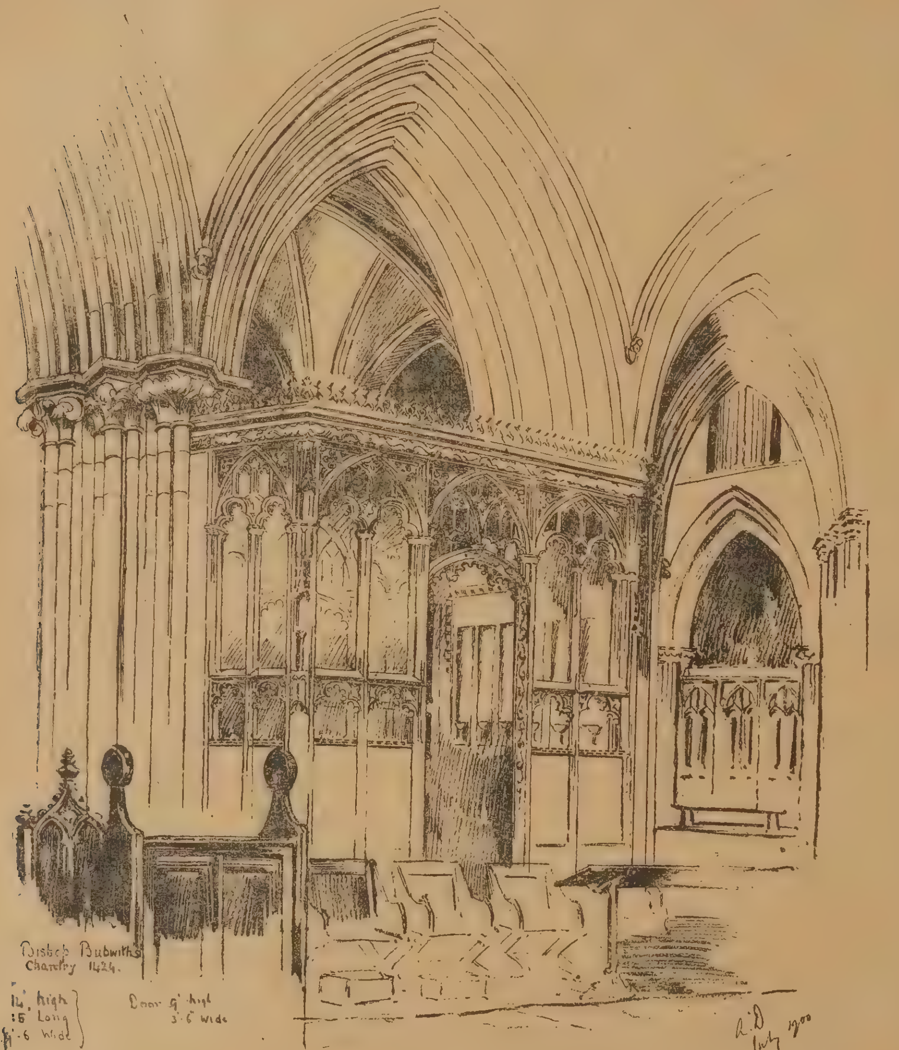
"BROADWAY CHAMBERS," BROADWAY AND CHAMBERS STREET, NEW YORK.
CASS GILBERT, ARCHITECT.

"Broadway Chambers," New York. THE problem of treating the tall building in a thoroughly satisfactory manner architecturally is probably insoluble, on account of the fundamental fault which exists in the proportion between height and width. As one of many admirable attempts made—such as that of Bruce Price with the American Surety Building—we would draw attention to the block of shops and offices illustrated on this page. Mr. Cass Gilbert has been particularly successful in his treatment of the windows, which, though repeated so exactly, are well proportioned to one another and to the whole structure. Moreover, the base, with its massive piers, gives a sense of adequate strength, which is maintained by the lines of the piers being carried up squarely to the top cornice; this latter, however, with its German stove ornamentation, is the worst part of the design—a squarely-treated cornice would have harmonised with the rest of the building, whereas the existing one is quite foreign to it. However much we may object to the system which demands such high buildings as this, architects have to meet the requirements; and when they are able to succeed so well as Mr. Cass Gilbert, they certainly deserve our praise. The building shown on the left of the illustration is the Shoe and Leather Bank Building, of which the architects were Messrs. Cady, Burg & See: the difference in the two treatments affords an interesting comparison, though it only enhances the superiority of the larger building.

SKETCHES AROUND WELLS.

By A. DURST, M.A.

THE church of St. Cuthbert, at Wells, was originally cruciform, with a central tower, but of the old church only a portion of the north transept remains as originally built. Early in the fifteenth century the great west tower was added, probably by Bishop Bubwith, who also built the north-west tower of the cathedral. The groined vault under the belfry is on the same lines as the Decorated vault in the cathedral. Later in the same century the whole of the nave was rebuilt in a somewhat unusual manner. The piers of the north and south arcades were raised, and the old Decorated arches re-used to carry the new Perpendicular clearstory above. The caps have also been carefully stripped of their foliage, leaving a smooth bell-shaped form beneath a wide-spreading abacus. The whole forms a most graceful and light arcade. The east walls of the north and south transepts were once rich with carved and coloured stone forming reredoses to the side altars of the church, but at the time of the Reformation these were broken, smoothed off and plastered over, after the manner of that period.



Besides St. Cuthbert's and the north-west cathedral tower, Bishop Bubwith built for himself a chantry (about 1424) in the ninth bay of the nave on the north side, which now corresponds to Sugar's chantry built about forty years later on the south side. Externally, the detail of this elegant little chapel is well preserved, but inside the carved niches and canopies on its east end have been hacked off flush with the wall. The doorways on the north and south were evidently, from the delicacy of their detail, never intended for doors or gates, the chantry being entirely open to the church.

Authorities differ as to which is the finest of the Somersetshire towers, but that at Chewton Mendip, at the foot of the north slope of the hills from which it takes its name, is certainly among the best. Though not so large as that of St. Cuthbert's, Wells, it is more graceful in outline and richer in its detail, and in its several parts typical of the many magnificent late Perpendicular towers of the county.

The Abbey Barn, Glastonbury, is the finest of several similar tithe barns in the neighbourhood. Its length, 93ft., is rather less than that at Wells, which is 110ft., but it far surpasses it in its proportions and the quality of the work. Though built for the most part during the Perpendicular period, there remain in its buttresses and some portions of the walling traces of an earlier building. The ornament concentrated on the gables takes the form of grotesques, symbolical of the purpose for which the barn was intended, and shows the religious spirit which animated the builders. The whole forms a splendid instance of architecture meeting the homely needs of the abbey in a practical and yet beautiful manner. One trembles to think of a twentieth-century Gothic barn!

In nearly all the villages round and about Wells many of the smaller domestic buildings have had much care bestowed upon their detail. In the once flourishing village of Croscombe, famous for its church full of carved oak, the house now known as "The First In and Last Out" inn is a picturesque example of late fifteenth-century work.

THE NEW "DRAINAGE BY-LAWS" OF THE LONDON COUNTY COUNCIL.

By G. A. ALLAN, late Sanitary Inspector, St. Martin-in-the-Fields.

UNDER the Metropolis Management Act 1855, the Metropolitan Board of Works had authority to make by-laws for regulating the drainage of buildings in the Metropolis, an authority they never exercised. The same Act required any person erecting a building to drain it to the satisfaction of the local authority or their surveyor. Under this section the several vestries and boards of works issued "drainage regulations." Summonses issued for breach of these regulations were dismissed on the ground that the local authorities had no power to issue regulations. Latterly they were only used as statements of the requirements as to drainage which would be necessary to complete the work "to the satisfaction of the local authority or their surveyor"; and when a summons was issued it was for improperly draining a building and not for breach of regulations.

The Public Health (London) Act, 1891, gave the London County Council authority to issue by-laws "with respect to water-closets . . . and the proper accessories thereof," which by-laws they issued in 1893. From 1893 until June, 1901, in the administrative county of London, the plumbing was regulated by the London County Council and the drainage by the various sanitary authorities. Plumbing was therefore uniform throughout London (outside the City); drainage varied with the idiosyncracies of the local bodies. And before summoning delinquents under the latter it was customary to ask what other authorities allowed.

In June last the London County Council, when issuing drainage by-laws, incidentally amended their by-laws as to plumbing, as explained in the BUILDERS' JOURNAL for October 2nd.

The drainage by-laws enact that no subsoil drain shall discharge directly into any sewer, but shall discharge into a trap; that the trap shall be connected to the sewer by a pipe laid and jointed as for sewage; that the inlet to the trap shall be ventilated to the open air, the opening to be protected by a grating the apertures in which shall equal the sectional area of the pipe. Drains for surface water are to be laid as for sewage, and to be fitted with properly-trapped gulleys. Except subsoil drains (which are not again referred to), all drains are to be of stoneware, iron or other suitable material. No drain shall be laid under a house except no other manner be practicable. No drain is to be less than 4in. diameter. All drains are to have a suitable fall. Except iron drains above ground which are supported at least at each joint by piers or other sufficient supports, constructed of iron, stone, brick or cement-concrete, all drains are to be laid on a bed of good concrete not less than 6in. thick, and projecting at each side of the drain at least equal to the external diameter of the drain.

Stoneware drains laid under buildings are to be covered with concrete at least 6in. thick; when not under buildings stoneware drains are to be embedded in concrete up to half their diameter, and of the full width of the concrete bed already specified.

Iron drains are to be jointed with molten lead, properly caulked. The depth of socket and width of lead space are given, but the quantity of lead to be used is not specified. Where practicable all drains under buildings are to be laid in straight lines, and where they pass under walls they are to be protected by means of an arch, flagstone or iron support. Means of access must be provided at each end of a drain passing under a building. The concrete to be used is to consist of 1 part cement, 2 parts sand, and 6 parts clean gravel, broken hard brick or other suitable ballast. All openings to drains, except for ventilations, are to be properly trapped. Dip traps, bell traps and D traps are prohibited. Rainwater pipes and channels are to discharge in the open air over a gulley or into a gulley above the water level; they are not to be constructed so as to receive solid or liquid matter from any water-closet, urinal, slop or other sink or lavatory. Every drain to be efficiently trapped as near as practicable to the sewer. A manhole is to be

provided for access to the trap. Except where the trap is fixed close to the building, a drain which is under a building will require at least three manholes. The manholes are to be made watertight up to the ground level, and to have suitable manhole covers fitted. If the manhole be within the building the cover must be air-tight. No right-angled junctions are to be used on drain or soil pipes.

Every drain shall be ventilated either by an inlet near the ground near the trap and an up-cast shaft at the highest part of the drain, or by an up-cast shaft near the trap and an inlet near the ground at the highest part of the drain, or by two high shafts which shall act indifferently as inlet or outlet, according to the direction of the wind or the flow of sewage in the pipes. All ventilating pipes are to be of 4in. diameter, except that 4in. drains may be ventilated by a soil pipe of 3½in. diameter. All waste-water pipes are to discharge in the open air over, in or near a trapped gulley.

There is no requirement in the by-laws for a separate drain for each house. I have seen, in London, two fairly large houses drained through one 4in. intercepting trap. It is not necessary to protect iron drain-pipes with any rust-preventing solution or process, though there is no doubt that Dr. Angus Smith's treatment makes the insides of the pipes much smoother and protects the iron very thoroughly. It is not necessary to provide and fix the mica flap on the inlet. This will grieve no one but the manufacturers of the mica flaps, and those who like their appearance. Section 8, paragraph (v.), requiring every pipe or shaft used in connection with the ventilation arrangements to be constructed in the same manner and of the same material and weight as if such pipe or shaft were a soil pipe, is obviously a mistake: or the connection from the manhole to the inlet may be of lead, though it would necessarily be underground. A lead pipe underground in a garden is not so good as stoneware and concrete. It will also be impossible to provide gulleys in the open air for the waste pipes to discharge over in connection with some buildings in London, unless the gulleys are fixed in the street. It is also to be regretted that it was not made compulsory to deposit plans of the proposed construction or reconstruction of drains.

Law Cases.

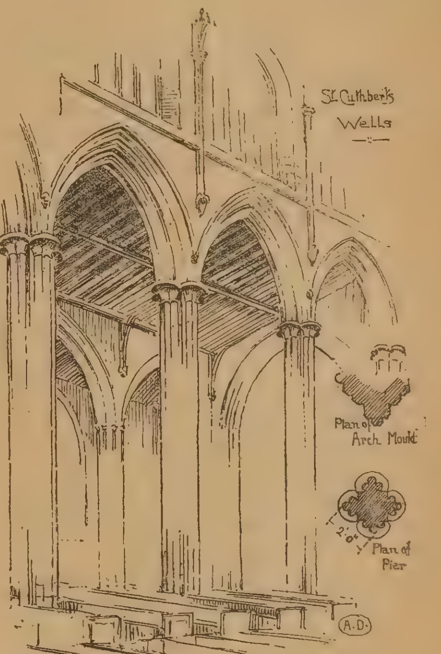
The Builder of Kumasi Fort.—Mr. W. Cheasley, a civil engineer, who went out to West Africa with the late Prince Henry of Battenberg and Sir William Maxwell in the Government service, and built Kumasi Fort, appeared at Southwark County Court recently on a judgment summons for a debt of £10 10s. 11d. due to Messrs. E. & H. Measures, of Bermondsey. The debtor said that he saved £700 at Kumasi, and on returning to Dartford he was induced by a landowner to build houses there. He got into debt and was sent to Maidstone Gaol. A month ago the "land shark" took five of his houses, worth £1,300, for £619 which he owed, and followed it up by obtaining an eviction order against him, his wife and two children. The judge made an order for 5s. per week.

Re C. G. Crowden.—An adjourned first meeting of creditors was recently held under this failure, the debtor being described as of Westbourne Bridge Wharf, Paddington, builder and contractor. A statement of affairs was now filed, showing a total indebtedness amounting to £48,475 7s. 3d., of which £4,852 5s. was returned as expected to rank for dividend, and assets, consisting chiefly of a surplus from securities held by creditors, estimated at £13,790 15s. 4d. The debtor, since 1899, had carried on business as a speculative builder, and had been engaged in building operations at Edgware, Kilburn and Little Ealing Lane. The failure was attributed to the debtor's inability to let certain premises, to law costs, and to interest on borrowed money. There was a further adjournment for three weeks to enable creditors to consider a proposal.

Re J. J. Weibking.—In the London Bankruptcy Court last week this debtor, a builder and contractor, of Southgate Road, N., applied to pass his public examination upon accounts showing gross liabilities £49,907 (£14,468 unsecured), and assets £7,322. The debtor stated, in examination by Mr. C. A. Pope, assistant receiver, that, starting business in a small way in 1872, he in 1881 compounded with his creditors and paid them 5s. in the £, afterwards continuing his business, which was that of contracting to buy old houses, pulling them down and rebuilding them for sale. He afterwards entered into building agreements for the erection of houses at Hoxton, Kingsland and elsewhere. He also erected the Wood Green Cycle Track. He attributed his failure to overbuilding, to payment of excessive interest on borrowed money, and to his inability to realize his property. He did not think he had lost much by betting. The examination was concluded.

Boxroom or Bedroom.—At the Ayr Dean of Guild Court on October 11th, Mr. D. Hill, insurance agent, applied for warrant to erect six houses in Fotheringham Road. The surveyor (Mr. John Young) took exception to a room designated on the plans a boxroom, on the ground that it did not comply in the matter of height with the building regulations, being only 6ft. 6in. instead of the 8ft. required for a habitable room. The applicant stated that the room was not intended to be used as a bedroom, but the surveyor pointed out that it had a fireplace and might be so used. The dean moved that the warrant be refused. Bailie Tait thought the surveyor was stretching a point in calling this a habitable room, and moved that the plans be passed. Bailie Morton seconded, and on a division the amendment was carried by five votes to three. The dean thereupon refused to sign the warrant.

Injury to an Adjoining House caused by New Building.—The case of *Holden* v. *Burton* was recently heard at the Blackpool County Court. The plaintiff claimed £50 for damages alleged to have been caused to his house in Princess Street by the defendant building a house against it. The judge, after reviewing the facts of the case, said he found there had been some slight increase of existing dislocations of the plaintiff's house, but he also found that there had been no negligence in the building of the defendant's house, for practically on the surface was the best way to build it to avoid the plaintiff's house subsiding. The damage was not caused by excavations or direct disturbance of the soil, but by the weight of the defendant's building pressing and compressing the peaty soil underneath both houses. The question of law he had reserved was whether the damage caused by the mere placing of the weight of building without removal, temporary or permanently, of the soil affording support to the adjoining house was an actionable interference with the plaintiff's right to the support of the defendant's adjoining land for his land and house. He was of opinion that the decision in the case of *Dalton* v. *Angus* governed the present one. The first question submitted to the judges in this case and answered by all of them in the affirmative was, "Has the owner of an ancient house a right of action against the owners of lands adjoining if he disturbs his land so as to take away the lateral support previously afforded by that land?" It seemed to him clear that there had been such a disturbance by putting the extra weight on the subjacent unstable strata. He thought, therefore, that the plaintiff had made out his case, and he assessed the damages at £10 10s.



Overhead Electric Light Wires.—The case of *The Finchley Electric Light Co., Ltd.*, v. *The Finchley Urban District Council* was heard on Wednesday last in the Chancery Division of the High Court of Justice. The plaintiffs moved for an interlocutory injunction to restrain the defendants from interfering with electric wires passing over roads in their district. Mr. Buckmaster, in support of the motion, stated that as the defendant council refused to allow the plantiffs to carry wires under the road, the company accordingly carried them over the road at a height of 34ft. On October 1st the Council cut the wire, though the company had been served with a notice of the regulations of the Board of Trade and had complied with them. The

Council had no power to interfere with a wire that was 34ft. above the road. The Lord Chief Justice, in giving judgment, said that on the facts before him he must assume that somehow or other the plaintiff company had obtained the consents of the persons on the adjoining sides of the highway and had put up these wires at a height of 34ft. The defendants' offer was not to keep matters *in statu quo*, but to keep a state of things brought about by their own act, which might be wrongful. The plaintiffs were entitled to an injunction in terms of the notice of motion until the trial, the costs of the motion to be costs in the action. The defendants, however, would have liberty to apply in case there should be grounds for relaxing the injunction.

Insufficient Lighting of Road Excavations.—In the Liverpool County Court recently, Arthur Shine, a foreman painter, sought to recover from Messrs. Hughes and Stirling, building contractors, of Bootle, the sum of £50 for personal and other injuries caused by the alleged negligence of the defendants in failing to sufficiently light and fence excavations made by them in the highway between Rainhill and Prescot. The plaintiff's case was that on June 29th last, about 10.30 p.m., he was cycling to Liverpool, and when in the neighbourhood of Prescot he had to pass a place where the highway had been partly blocked for tramway construction or repairs. The defendants were the contractors, and they had there a watchman, and lights on one side of the thoroughfare, but there was nothing to warn the public of any danger in passing on the other side, which apparently was left open for traffic. After riding past the watchman's fire, and while going at a moderate speed the plaintiff suddenly fell into an excavation between the tram lines. For the defence it was contended that the road was properly fenced, lighted and watched. The jury, however, awarded the plaintiff £30 and costs.

Correspondence.

Sir Simon Leach: His Monument.

To the Editor of The Builders' Journal.

Sir,—The remote village of Cadeleigh, not far from Tiverton in Devon, possesses an interesting village church, the crowning glory of which is a magnificent Jacobean monument with life-size sculptured figures surmounted by a heavy canopy; a most complete and handsome example of the gorgeous Renaissance period. The monument was erected by Sir Simon Leach, a quondam sheriff of the county, to commemorate himself and his descendants, and in order to keep his memory green he also left a sum of money for the repair of the monument. Ill fortune however attended the family, and I believe it is now quite extinct in the direct line. The family mansion is a humble farmhouse, and the money that was left to keep the tomb in repair, although invested in land, has been allowed to lapse for the incredible reason that, in the sleepy meridian of the last century, no trouble was taken to collect the rents. When I saw the tomb a few weeks ago it was doomed to destruction. The canopy was falling backwards and was endangering the fabric of the church, and in a fortnight was to have been removed for safety's sake. For the time being the parish authorities are holding their hands, while I am doing my best to arouse interest in what is the finest example of the period in Devonshire. It will be a standing reproach if the tomb be destroyed, or allowed to be removed from the church in which Sir Simon worshipped and in which he desired to rest with his wife and children. The cost of underpinning and preserving the monument will be only £80, of which about £25 has been promised. The parish is very poor and the population small. May I appeal through you to the many lovers of the ancient and picturesque relics of our country for help in the work of preservation. It is not desired to restore, only to preserve. Many Devonians in London will, I am sure, send a small subscription for the sake of the old county. The most trifling sum will be gratefully received by Miss Chichester, Calverleigh Court, Tiverton, or by—Yours truly,

PRESCOTT ROW.

The Homeland Association, 24, Bride Lane, E.C.

BURY ART GALLERY.

The Bury Art Gallery and Public Library, which was recently opened, is situated at the corner of Moss Lane and Silver Street, in the borough of Bury, and has a frontage to Moss Lane of 110ft., and to Silver Street 105ft. The structure comprises three complete storeys: basement, ground, and first floors, with a sub-basement under the rear for the heating and ventilating plant. The first floor is entirely devoted to art, and is approached from a sculpture hall on the ground floor by a spacious stone staircase. There are five galleries arranged in sequence, the sizes varying from 27ft. by 33ft. to 27ft. by 61ft. Provision is made for cloakrooms, &c., and at the back of the building there are suitable rooms for book repairing. A large hoist connects the loading way with all floors. The ground floor has been devoted to library purposes, and is reached by a vestibule from Silver Street. The basement is chiefly devoted to stores space under the library, and connected therewith is a large book store. At the rear of the building is a loading way for receiving books, pictures, and a hoist and packing-room. The principal elevations are faced with boasted ashlar, obtained from the Higher Stancliffe Quarries, Darley Dale, Derbyshire; the remaining elevations are faced with Ruabon bricks. The joiners' work generally is Kauri pine, stained and varnished. The gallery floors are laid with oak parquetry, the library with oak blocks, and the reading-rooms with pitch-pine blocks. The vestibules and halls have mosaic floors, and the steps, landings, &c., for the staircases are blue Shepley with Bath-stone balusters and handrail. The building is heated and ventilated on the "Plenum" system, being of fireproof construction throughout, and lighted by electricity. Messrs. Thompson & Brierley, of Bury, have been the general contractors, and there have been many sub-contractors. The furniture and fittings have been executed in Dantzic oak by Messrs. Goodall, Lamb & Heighway, Manchester. The whole of the work, including the fittings, has been carried out from the designs, and under the supervision of the architects, Messrs. Woodhouse & Willoughby, of Manchester, whose design was chosen in an open competition.

GOSPORT LIBRARY AND TECHNICAL INSTITUTE.

A new Free Library and Technical Institute for Gosport and Alverstoke was opened recently at the corner of Clarence Road, South Gosport. The total cost has been between £7,000 and £8,000. The public entrance to the free library department is placed in the centre of the Walpole Street facade, the entrance porch giving direct access to the lending library, the reading and news-room, the reference and reading-room, and the librarian. The rooms in the art department occupy the whole of the first floor area of the front, or Walpole Road elevation. The technical institute is placed in the return block facing Clarence Road. The accommodation provided comprises the following rooms: on the ground floor a physical laboratory, a chemical laboratory, and a class-room; and on the first floor a cookery room and two large classrooms. The caretaker's rooms are placed in the upper stage of the tower. The works have been carried out by Messrs. Rashleigh & Son, of Southampton, under the immediate supervision of Mr. H. Frost. The architect, whose design was selected in a limited competition, is Mr. A. W. S. Cross, M.A., F.R.I.B.A., of 58, Conduit Street, Regent Street, London. A modelled plaster frieze over the library entrance was designed and executed by Mr. F. E. Schenck. The centre portion depicts the landing of Henry de Blois on what is now the Gosport shore, and the east and west panels are emblematic (1) of Henry Cort, whose works were situated on Gosport Green and by the river Meon at Funtley, about 1785; he was an inventor, and we have to thank him for discovering the process of converting hard pig iron into a soft and malleable condition. He is said, also, to have been the first man who constructed a system of drawing wrought iron into bars by means of grooved rollers. The result of his improvements and the introduction of his furnaces caused the output of iron in England and Wales to suddenly jump from 150,000 to millions of tons per annum; and (2) of the Lady Alwara, the wife of the Saxon Thane, Leowin, from whom Alverstoke is said to get its name.

THE SAD CASE OF LIVERPOOL CATHEDRAL.

BLOMFIELD v. GLADSTONE.

A LIVELY debate concerning the proposed Liverpool Cathedral has been going on in the "Times" between Mr. Richard Blomfield and Mr. Robert Gladstone. Referring to the latter's speech at the meeting of the Executive Committee (see page 161 of our last issue) in the course of which he stated that "there could be no question whatever in the minds of thinking people that Gothic architecture produced a more devotional effect on the mind than any other which human skill had yet invented," Mr. Blomfield says:—

"Mr. Gladstone was good enough to supply the dates of the precise period of Gothic (1220-1320) which commended itself to the judgment of himself and the Committee, and the Committee unanimously resolved that the style of their new cathedral is to be Gothic and nothing else. They also resolved on a method of procedure exactly calculated to prevent any architect of standing and experience from competing.

"Their method of procedure is an affair for the Committee, but their assumption of authority on a point of architecture can hardly pass unchallenged.

"In the first place, the result of their decision will be that the architects who do submit designs will have no voice in the question of treatment. The Committee have taken on themselves this special and essential function of architecture, and the architects are merely to prepare designs to a selected set of details, for we know by painful experience that by 'Gothic' is understood a more or less exact reproduction of some mediæval building. Under the circumstances the Committee are hardly likely to get a tolerable building, more especially as the method proposed for obtaining designs has been condemned by competent opinion for the last thirty years.

The Amazing Dogma.

"This, however, concerns the Committee and the architects who compete. The amazing thing about the whole proceeding is to hear in 1901 a dogma as to the sacrosanctity of Gothic architecture (and even of a certain period of it) solemnly propounded and assented to by a committee of influential laymen and others responsible for a very important building enterprise. We seem to be back in the fifties, when this sort of view was taken as an article of faith by ardent young amateurs with High Church propensities. Were it not for the probable consequences there would be a pleasing interest in this quaint revival, sixty years out of date, of the views of the Cambridge Camden Society. Mr. R. Gladstone finds his devotions quickened by the pointed arch, but surely this is rather a slender foundation on which to raise a law that this and no other is to be the only possible type of building under which future generations may devoutly worship. He appears to have forgotten that the Roman basilica was the original of the Christian Church, and that for some eleven centuries Christians had to content themselves with the spiritual encouragement of the round arch or the lintel. Yet it is probable that these Christians had a capacity for devotion not inferior to that of the Liverpool Executive Committee, and the growth of Christianity does not appear to have been retarded by the absence of the pointed arch. It is surely the *reductio ad absurdum* of religious devotion to make it conditional on cusps and crockets.

"No one would for a moment dream of reviving the futile old controversy of Gothic and Classic, a controversy based on a misconception of the nature of architecture; but what every intelligent person contends for is that in these matters there should be a fair field and no favour. Professor Simpson, as the president of the Liverpool Society of Architects, has put the matter clearly to the Executive Committee, but the Committee rises superior to expert opinion with some astounding results to the logical mind. Either the spiritual thought and feeling of modern Liverpool are the same as those of the cathedral builders of the thirteenth century or they are not. If they are the same, no doubt the language of the builders of Salisbury will precisely express the aspirations of the Liverpool merchant and mechanic of this century; if they are not the same that language becomes meaningless as an expression of modern thought, and to insist on its use is to reduce the art of architecture to a masquerade and a sham. No doubt the sapience of the Committee will find its way out of the dilemma and give the mere expert another necessary lesson."

Mr. Gladstone's Reply.

In reply to Mr. Blomfield, Mr. Robert Gladstone says, in a letter to the "Times," that "while classical architecture has naturally been the prevailing style in the south of Europe, Gothic in one form or another has been almost universally adopted for ecclesiastical buildings in this country. May I remind Mr. Blomfield that all our cathedrals, with the single exception of St. Paul's, are Gothic, and an overwhelming majority of our parish and other churches are in the same style? So strong is the general feeling in favour of Gothic for our churches that I have little hesitation in saying that, if the style for our cathedral had been left open, nine-tenths of the designs submitted by architects would be Gothic. In support of this opinion, may I remind Mr. Blomfield that in the previous competition for a Liverpool Cathedral in 1884 the second and third premiums were gained—with the approval of our assessor, Mr. E. Christian—by Gothic designs; and the first prize, given to Mr. Emerson, was for a design specially calculated to be in harmony (so far as possible) with the adjoining classical buildings?

The late Sir Gilbert Scott on Westminster Abbey.

"As regards the effect on the eye and mind, let me quote what the late Sir Gilbert Scott said in an address to the Institute of British Architects regarding Westminster Abbey:—

"'—A building which does not owe its claims upon our study to its antiquarian and historical associations, intensely interesting though these must be to every man worthy of the name of an Englishman. It has claims upon us architects—I will not say of a higher, but of another character—on the ground of its intrinsic and superlative merits as a work of art of the highest and noblest order; for there are few churches in this or any other country having the same exquisite charms of proportion and artistic beauty which this church possesses; a beauty which never tires, and which impresses itself afresh upon the eye and the mind, however frequently you view it, and however glorious the edifices which, during the intervals, you may have seen.'

"Such is the type which we have adopted for our cathedral. Is it an inferior one? Can Mr. Blomfield suggest a nobler one? If he can, let him at once tell us what it is, and, in the interest not only of Liverpool but of our country, give us an opportunity to consider it.

A Little History.

"I have not forgotten that the early Christians converted the available basilicas into churches, nor do I forget how the apse with its railings became the chancel of later times. I have been a student of architecture for forty years, and am not ignorant of the rise and fall of Gothic architecture; of how it emerged from the clumsy grandeur of Norman, attained its most sublime beauty during the hundred years to which I referred, and then by the elaboration of pretty details it gradually deteriorated until architects in despair called in the more sturdy accessories of the Grecian and Roman Orders to revivify their expiring art. After a while this classical resuscitation passed away, to be succeeded by a revival of Gothic, wretched enough for many years, but now better understood and exhibiting in many places much of the spirit of our old cathedral buildings.

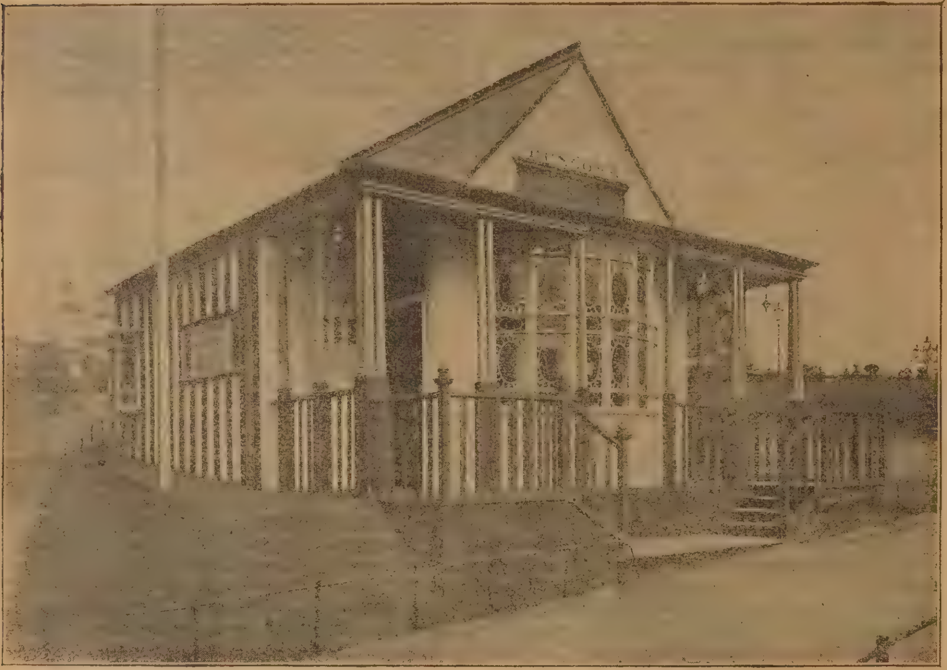
The Abbey as a Guide.

"We are told that Gothic is again passing away.

It may be so; but what do our leading architects offer us in its place? At present it may be truthfully asserted that no new style of architecture has been invented, unless it be the glass and iron construction of the Crystal Palace; and in these circumstances I feel that if we take the interior of Westminster Abbey as our guide in building Liverpool Cathedral we shall follow the most beautiful and most devotion-inspiring example of church architecture that this country affords. In conclusion, I say to Mr. Blomfield, 'Si quid novisti rectius istis, candidus imperti; si non his utere mecum.'"

The Challenge Accepted.

Mr. Blomfield takes up Mr. Gladstone's challenge:—"The number of issues he (Mr. Gladstone) raises is somewhat bewildering. He adheres to the position that 'Gothic' is the only possible style for a cathedral. He quotes Sir Gilbert Scott on Westminster Abbey, and he asks me to supply him with a new style in architecture. The dilemma which I put before him he has not attempted to answer—perhaps it is unanswerable; but he remarks incidentally that had the design been left open 'nine-tenths of the designs submitted by architects would be Gothic,' to which I need only reply that it depends on the architects. The authority of Sir Gilbert Scott, moreover, will hardly convince contemporary architects, but Scott was a very able man. Whatever his practice he knew good work from bad, and in the quotation which Mr. Gladstone supplies us he praises Westminster Abbey, not for its historical associations, nor for its fitness for modern necessities, but solely as a beautiful work of art in itself. So far as any relevance to modern thought is concerned Mr. Gladstone might just as well have quoted Professor Cockerell on the Parthenon.



THE BENSON PAVILION AT THE GLASGOW EXHIBITION.

Of Restrictions to Styles and the Real Architect.

"But the points at issue between architects and the Committee are more serious than this. In the first place, there is the general question of the restriction to any style at all; in the second place, the restriction to Gothic, and even Gothic of a certain specified period. Now, in restricting designs to any style at all the Committee have misapprehended the work and duty of an architect. The popular conception of an architect is that he is a man who sits down and makes pretty drawings, or, if he does not, employes somebody else to; that he hands these over to the builder, and that this, artistically, is an end of the matter. Of the underlying process of thought, of the careful consideration of all the bearings of the problem, of the deliberate selection of one out of many experiments of the imagination that every architect worthy of the name must go through before he puts pencil to paper, the Committee seems to have had no sort of suspicion at all, for they blandly undertake the preliminary process themselves and inform architects that their designs are to be Gothic, and even English Gothic of the thirteenth century. Architects may, and probably will, form an entirely different estimate of the situation. They may think that an architectural language which has long since died a natural death is inadequate to express the teeming thought and emotion of modern life. In any case, whether they do or do not, they would probably be unanimous in agreeing that this essential function of the expert should not be taken out of his hands. Architecture is a serious art, and not the mere plaything of cultivated amateurs, and I think it improbable that any architect properly so called would undertake such an enterprise as this with his hands tied.

Why "Gothic"?

"In the second place, we come back to the old question, Why 'Gothic'? Mr. Gladstone reminds me that all our cathedrals are Gothic 'with the single exception of St. Paul's'—truly a formidable exception. May I also remind Mr. Gladstone that at the date when those cathedrals were built no other style was possible or even dreamt of, and hence the admirable sincerity and individuality of these cathedrals—qualities which the most ardent Classicist will readily admit. But what are we to say now, when the whole world of 'styles' is open to a designer? Is there any sincerity of expression in reproducing a dead language? (for that is the serious intention of the Committee's resolution); and even if Gothic architecture did express the thought and feeling of a number of people, it is quite certain that it does not express the feeling of everybody.

A Comparison between St. Paul's and Westminster.

"There are those, and it is possible that they are not a minority, who would find the dome of St. Paul's Cathedral at least as suggestive of religious thought as the clearstory of Westminster Abbey; for, after all, a cathedral is not a church adapted to one particular congregation or to one particular shade of theological opinion. A cathedral, one would think, should provide for all shades of thought and opinion that may fairly meet within its walls, and one cannot protest too strongly against this narrow identification of religious worship with one particular phase of architecture.

A Model for the Cathedral of the Future.

"Mr. Gladstone asks for a 'style,' but we are sick of styles. Nowadays every man must think for himself, and nobody reaches style unless he can carry his own individuality into the expression of his thought.

"The less, therefore, we hear of styles the better for architecture; but if Mr. Gladstone really wants a model for the cathedral of the future let him look for it among the ruins of the Baths of Caracalla at Rome."

In further reply to Mr. Blomfield, Mr. Robert Gladstone says: "The great central room in St. George's Hall, Liverpool, is said to have been designed from one of the thermæ at Rome, and as a place for public ceremonies and musical festivals it is magnificent; but it would not be suitable for a church. Indeed I do not hesitate to say that Italian architecture is not suited to ecclesiastical buildings in this country, for which we prefer our national Gothic. In proof of this may I point to the Cathedral at Truro, the new Cathedral at Edinburgh, and the splendid church lately built by Mr. Austin at Stockport, all of which are Gothic? . . . . . It is possible, perhaps, that in some quarters a hope is entertained that in an unlimited and unrestricted competition something would turn up which might prove to be an entirely new and completely satisfactory design for a new cathedral; but what reason is there for expecting this?"

H. C. S. asks Mr. Blomfield "to give a reason for our resuscitated old friend, the assumption that 'Gothic' is the only 'dead style'? How is it different from either Greek, Roman, Classical Renaissance, or the new pet the 'Adam,' style?"

Builders' Notes.

Mr. William Woolaway, a well-known Barnstaple builder, died recently at the age of fifty years.

Mr. John Booker, of Beaumont Terrace, Bognor, the eldest partner in the firm of Messrs. Booker Brothers, builders, died recently.

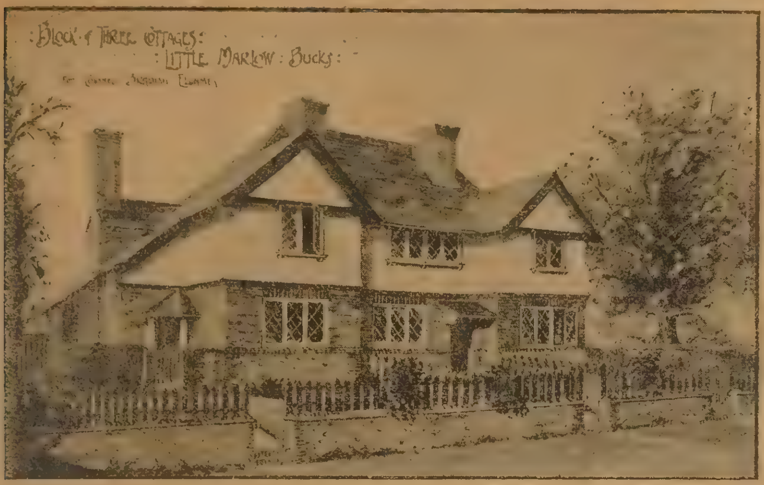
"La Pierre Artificielle."—This is a title of a new eight-page monthly journal which has just been issued. It is published at 9, Rue Montenotte, Paris. The annual subscription is six francs in France and eight francs (6s. 8d.) abroad.

Insanity among Workmen.—As the result of enquiries into the subject of last year's admissions to London asylums, Mr. N. W. Hubbard, L.C.C., has found that of 1,671 male patients received, 286 were labourers, 54 painters, 38 carpenters and joiners and 14 bricklayers.

A Catalogue of Builders' Goods.—Messrs. Young & Marten, the well-known builders' merchants, of Stratford, E., offer to supply copies of the latest edition of their catalogue to builders free. As this large book is fully illustrated and contains particulars and prices of almost every class of goods used in the building trade it will doubtless be much sought after.

A "Ring" in Corporation Contracts.—The Manchester City Council recently advertised for tenders for the concrete foundations of engine-beds and the building of two chimneys at the Stuart Street electric-power station. Two were lower than a third by over £1,000, but no time for the completion of the work was stated. One of the two contractors was asked by a councillor to state a time; but as this practically gave the firm two chances, fresh tenders were advertised for, with the result that the third contractor's tender was lowest, except for a fourth firm whose tender was £126 lower; but this latter giving no date for completion, the third firm's tender was accepted. It was then alleged that there was a "ring" among the Manchester builders to work the Corporation contracts, but this is authoritatively denied by the Master-Builders' Association.

London County Council.—At last week's meeting of the Council a very lengthy report was submitted by the Improvements Committee stating the facts in connection with the proposed widening of Piccadilly between Hyde Park Corner and Walsingham House. In conclusion it was stated that the formal consent of the First Commissioner of Works was only now needed for the widening to be proceeded with, and a letter had been received from Mr. Akers-Douglas stating that he would see the Committee in a fortnight or three weeks. The report was received with considerable discussion.



ARTHUR E. THOMPSON, ARCHITECT.

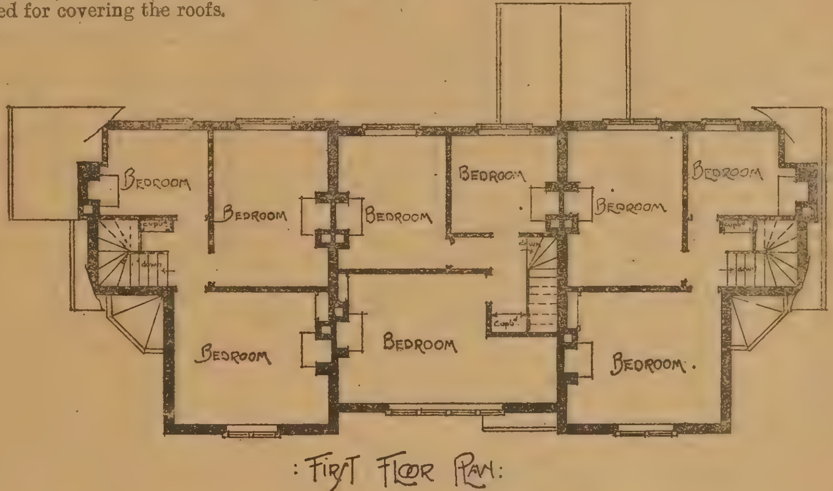
in the course of which Mr. John Burns, M.P., said that he would rather have the opinion of cabmen and the police than all the Royal Academicians who spent their leisure time in writing to the "Times." If they went to the other side of Piccadilly the widening would cost £1,250,000 or £1,500,000 instead of £30,000. They would never again get such an opportunity.—Mr. Bruce, replying to a question, said that the pedestal for the Boadicea group at Westminster Bridge had proved a difficult matter. A contract was made many months ago with the Bude Quarries, but owing to a strike no masons could be got to cut the stone. Considerable pressure was brought to bear, and the stone was sent up to Aberdeen to be worked. When it reached London it was condemned by the architect of the Council. Other stone was sent to Aberdeen, which was also condemned. Then the Works Department took the work in hand, and granite was bought in London and placed on the site. That stone was satisfactory, and it was hoped that the work would be finished this month.—Replying to another question, Mr. H. Ward said there had been considerable delay in the rebuilding of Vauxhall Bridge, and the work would not be finished for at least another twelve months.

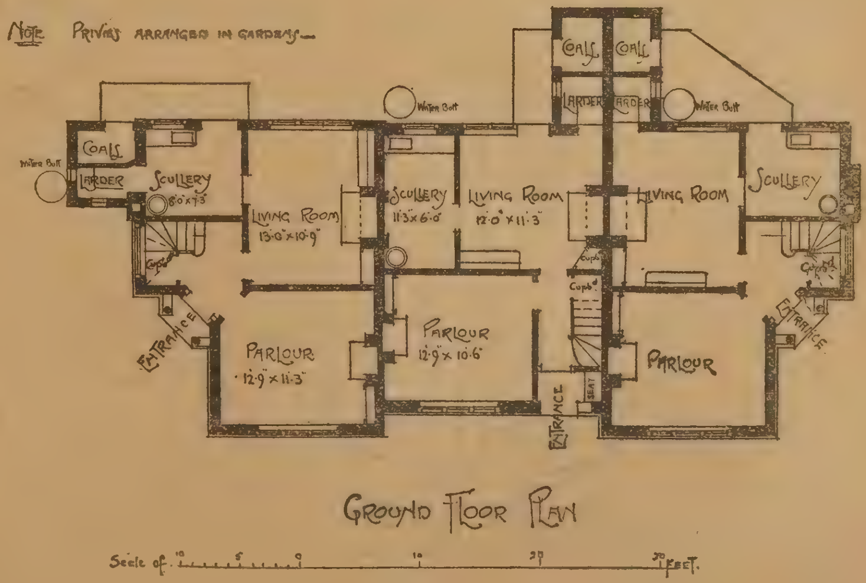
A New Unionist Club at Alloa has been erected at the corner of Union Street and Coalgate. The following were the contractors: mason and brick work, Mr. James Philip, Tillicoultry; carpenter and joiner work, Mr. Robert Keir, Tillicoultry; slater work, Mr. John Walker, Alva; plaster work, Mr. James Grant, Alloa; plumber work, Mr. James Philip, Alloa; painter work, Mr. John Robertson, Alloa; upholstery work, Mr. James Rigg; electric lighting, Messrs. Loudon Bros., Dundee. Messrs. John Melvin & Son, of Mar Street, Alloa, were the architects.

The Benson Pavilion at the Glasgow Exhibition, illustrated on the opposite page, was designed throughout by Mr. W. A. S. Benson, of New Bond Street, and is a combination exhibit of art work by London firms. The well-known Benson electric fittings and metalwork are shown in the small offices which lead off the main room, at one end of which is a showcase containing glass made by Messrs. James Powell & Sons, of Whitefriars. The wallpapers are by Messrs. Jeffrey & Co., of Essex Road, Islington; while the grate in the large room was designed by Mr. Ernest Newton and made by the Falkirk Iron Co., the tiles enclosing it being the work of the Pilkington Tile and Pottery Co., of Manchester. The front Benson bay window is clearly shown in the illustration. Its chief points are that the circular uprights allow bays of any angle to be constructed, and the panels and casements are designed in graduated sizes, so that they can be accommodated to a wide range of openings; moreover, the window is supplied complete with mullions, the sections being simply secured together. The roof and outer walls of the pavilion are of "Texyl," which consists of a combination of corrugated sheet iron and cement: in this case "Petrifite" has been used.

A BLOCK OF COTTAGES.

THE block of three cottages on the manor of Little Marlow, Bucks, illustrated on this page and designed by Mr. Arthur E. Thompson, of Leadenhall Buildings, E.C., is being erected for Colonel Bradish Ellames at a cost of £656 (including the front boundary wall) by Messrs. W. and T. Sellman, of Great Marlow. The cottages are built of brickwork throughout, faced with rough-cast above the first-floor level, and with red bricks below and split flintwork in the plinth. Diagonal lead-lights are being used in the windows, and old tiles have been specially obtained for covering the roofs.





Engineering Notes.

Messrs. Thomas Crapper & Co., of Marlborough Works, Chelsea, London, S.W., have been appointed Sanitary, Warming and Ventilating Engineers to His Majesty the King.

The First Section of the New Water Scheme for Belfast was successfully inaugurated recently. The water is being brought from the Mourne Mountains, a distance of forty miles, and the works are estimated to cost one and a half millions sterling.

Three New Railways have been opened in Scotland. The most important is that to Lochearnhead by an extension of the Crieff-Comrie line. A second railway is the Shrieldmuir, Wishaw, and Newmilns line, which will serve iron and coal centres. The third is a light railway to Leadhills, the highest inhabited town in Scotland.

Waterloo Railway Station is to be extensively altered at a cost of £750,000. The platforms are to be increased in length and new buildings erected. The station will have a new front with the main entrance in the Waterloo Road, but an approach is to be constructed from the Westminster side, and passengers will be able to drive direct to and from the platforms at which the trains stand.

Mr. Bernard Shaw and Ventilation.—Mr. G. Bernard Shaw, who is a member of the St. Pancras Borough Council, objects to the atmosphere of the local Town Hall after the full Council has been sitting some time, and will move at the next meeting that, in view of the fact, it be an instruction to the Public Health Committee to report to the Council at an early date as to the best means of providing a sufficient supply of properly filtered and warmed fresh air to the Council chamber during the winter months.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*Your own character will form your style . . . but my business is to prevent, as far as I can, your having* any *particular style.*"—RUSKIN.

Our Plates. COLES FARM, BOX, about six miles from Bath, is a fine old farmhouse commanding splendid views of the surrounding country. It was erected in the seventeenth century, and still remains with the descendants of the original builder. The exterior is a plain stone structure with well-proportioned gables and chimneys covered with ivy. The dining-room is the chief feature of the house, on account of its beautiful oak panelling, dated 1649, and very richly-modelled plaster frieze and ceiling. Unfortunately, it has been empty for some years, and has fallen a prey to the rampant species of old furniture hunters, to judge by the gaps in the panelling. Nearly one-third of the oakwork has disappeared since the spring, including the carved date panel which gave the value to the whole room.—The new baths and washhouses for St. Pancras, which have been erected in Prince of Wales Road, Kentish Town, were opened recently. The site cost about £18,000, and the buildings consist of four swimming baths and 129 slipper baths, together with a public washhouse with fifty washing compartments. There are frontages to three roadways. The men's first-class swimming bath is 115ft. 6in. long and 50ft. wide, the actual bath being 100ft. by 35ft., and there are eighty dressing boxes, all made to remove during winter. At the deep end of the bath a large diving stage and a water chute have been provided, and an overhead shower can be obtained by means of sprays from the ceiling, which has been designed to prevent the splashing echo. A gallery is also provided capable of seating about 450 persons. During the winter months the swimming pond of the bath will be floored over and will be used for concerts, &c. It will have seating accommodation for 1,200 persons. The men's second-class swimming bath has a pond the same size as that in the first-class bath, and there are 108 dressing-boxes with accommodation for 150 bathers. The two other swimming baths are smaller and will be for women. In the public washhouse electric irons will be used. Refreshment-rooms and a *crêche* have been provided. The buildings throughout are lighted by electricity, which also supplies nearly all the motive power. Two artesian wells are being sunk on the premises, which, it is hoped, will yield between them about 25,000 gallons of water per hour. The cost of the buildings, together with all machinery and fittings, has been about £75,000.

Mr. Lockwood Kipling. MR. LOCKWOOD KIPLING, who has illustrated "Kim," Mr. Rudyard Kipling's new story, has long held the reputation as one of the highest living authorities on Indian native art. From his first entry into the Indian Service as an architectural sculptor in 1865 until his retirement in 1893 Mr. Lockwood Kipling unceasingly endeavoured to raise the standard of artistic culture in India. Whilst his designs for the pavilion at the Delhi Imperial assemblage and for the heraldic banners presented there to the chiefs testify to his originality and fertility with the brush, the Mayo School of Art and the new museum at Lahore bear witness to his ability as an architect. His first considerable literary work was a description of the Hindoo village system of the Deccan, to elucidate which he prepared the elaborate series of drawings now preserved at the South Kensington Museum. In 1875 he started the Lahore School of Arts and Designs, and one of his first pupils was Ram Singh, who afterwards designed for Queen Victoria the new dining-room at Osborne.

Monuments in Berlin. THE Kaiser has decided that the right and northern semicircle outside the Brandenburg Gate, towards the Siegesallee and the Reichstag building, Berlin, shall be the site of a monument of his father, the Emperor Frederick. The Emperor has also decided to erect a monument to his mother, the late Empress Frederick, on the southern semicircle. The houses round the Brandenburg Gate will be removed, so that the monuments may be clearly visible from Unter den Linden. The Emperor has entrusted the execution of the Empress Frederick monument to Herr Hans Everding, a young sculptor of five-and-twenty, now in Rome, whose acquaintance he made at Cassel. Everding won a small gold medal at the Art Exposition in 1898. The adjoining graves of two celebrated Parliamentarians—Lasker and Bamberger—are about to be covered with a large and richly-ornamented stone and surrounded with an iron railing. On this stone will be placed a monument of polished Norwegian granite, flanked with two lofty pillars, between which will be placed a dedicatory tablet of bronze. The monument has been designed by the State architect, Thierbach.

The Manchester Monument of Queen Victoria. THE Manchester Queen Victoria statue, which was unveiled recently, is the work of Mr. Onslew Ford. It was exhibited at this year's Royal Academy. The Queen is seated on her throne, the sceptre in her right hand, the orb in her left, and a coronet upon her head. She wears her Garter robes, with the sash and star of the Order on her breast. Queen Victoria gave Mr. Ford a sitting for the statue some three years ago, and the features of the Queen in the statue are a likeness of Her Majesty as she then appeared. The dress worn by the Queen when she sat as a model for the sculpture was of fine lace, and under the coronet a veil is draped. From its base to the top of the coronet the statue is 9½ft. in height. The height of the Chair of State on which the Queen is seated is 19ft., and of the pedestal 5ft. This is reached by half a dozen 6-in. steps. The chair is sculptured in Mazzano marble, and the design may be described as Renaissance. In a division between the mouldings at the top of the back of the chair is a representation of St. George and the Dragon, and above the head of the Queen the Royal Arms are engraved. Mr. Ford considered that it would be unwise to leave his work in such a condition that while the obverse was a specimen of the skill of the sculptor, the reverse, as seen by people seated on the benches in Piccadilly or from the windows of the infirmary, would be a large blank space. He therefore designed and executed an allegorical figure of "Maternity." This comprises a partially draped female holding two young children. This figure is sheltered in a niche behind the statue. Above its head are the arms of the Manchester Corporation. The figures of the Queen and "Maternity" are in bronze, and they consequently will not suffer from the exposure to the weather and the Manchester smoke. The statue and its accessories have cost about £6,500.

The Kaiser's Taste in Art. A REMARKABLE article on the Kaiser's views on art appears in the "Vorwärts." It will be remembered that his Majesty objected to the "fairy tale" fountains which it was proposed to erect in the Friedrichshain, on the ground that they were too imposing and architectural. He suggested something simpler which could be more readily grasped by the working-class children who play in the Hain; something more "kindly cheerful" as he expressed it. The leading Socialist journal is able to detect two distinct trends in the Kaiser's views on art matters. On the one side he admires the pompous and magnificent, laden with mythological ornament. This style he reserves for what the "Vorwärts" calls his "Hohenzollern" work, for work devoted, for example, to the glorification of the old Kaiser and Bismarck, for the marble squadrons of Victoria Avenue, &c. On the other side he demands that the people shall have the simplest art possible, something innocent and easily understood. He objects to complicated music for the people, to drama which excites or causes discontent, for example Hauptmann's "Weavers." In this way, the "Vorwärts" explains the Kaiser's dislike of the proposed "fairy tale" fountains. In front of his Schloss and in Victoria Avenue are suitable sites for the architecturally imposing, but for the people in Friedrichshain he wants something simple and agreeable. It is only fair to add that the "Vorwärts'" sweeping generalisations are hardly justified by anything that has yet occurred.

Battle Abbey. THE world-famed Battle Abbey, whose associations are so indissolubly interwoven with the history of the English people, will shortly be submitted for sale at the Mart, Tokenhouse Yard. Founded in 1067 by William the Conqueror, who, in pursuance of a vow made on the eve of the battle of Senlac, erected on the site of the struggle the Benedictine monastery of St. Martin of Battaille, and endowed it with all the lands within one league, but little of the original structure has survived the Dissolution by King Henry the Eighth in 1538. The Conqueror's sword, deposited in the shrine with the roll of his barons, has long since been lost, while the latter, which was extant in 1793, is supposed to have perished in that year in the burning of Cowdray House, near Midhurst, Sussex. Of the building itself there are still the ruins of the high altar of the Abbey Minster, traditionally supposed to stand on the spot where the ill-fated King Harold received his death-blow, and the wall of the west nave near the Cloister Garth, containing in one of its inner niches the remnant of a stone sarcophagus, and adjoining the site of the Holy Well. Parts of the refectory, with its graceful and lofty Early English lancets, are also preserved, while the Gate House, added in 1338 by Abbot Retlynge, and composed of a central tower over 50ft. high, with octagonal turrets and panelled battlements, forms, with its beautiful tracery, canopied niches and windows and interlacing arches, one of the finest specimens of the Decorated period in the whole kingdom. Additions since the Dissolution are the Cloisters and Guest House attributed to Sir Anthony Browne, to whom the site, edifices and land were granted by King Henry the Eighth, while the late Duke of Cleveland, who purchased the domain in 1857, and reconstituted the north front as a country mansion, adopted a style of architecture entirely in keeping with the ancient battlemented structure. The Abbey grounds extend over about eleven acres, and points of interest are the Cameller Walk from which steps lead to the Sentinel's Wall on the battlements of the precinct wall, the famous yew walk next the precinct wall, and the freectory garden with its magnificent magnolia trees.

Masters and Men.

A New Building Trade Employers' Amalgamation.—A gathering took place at the Builders' Exchange, Leeds, recently, of representatives of the various National Associations connected with the building trades. For some time past efforts have been in progress for bringing into closer union the building trade employers. Meetings have been held in connection with the various trades affected, at which draft rules have been agreed upon. The representatives were engaged in making the necessary arrangements for propaganda work, &c. The name by which this association is to be known is that of the Federation of National Associations of Master Plasterers, Plumbers, and Slaters, and as the name indicates, will include these three National Associations, while the rules also provide for the inclusion of other national associations connected with the building trade. The principal object of the Federation is to promote the adoption of a common policy on all matters affecting the associated trades. The election of officers resulted in the appointment of Mr. W. R. Thompson, of Dewsbury, as president; Mr. A. Wheater, Leeds, vice-president; Mr. Dyson, Halifax, treasurer; and Mr. George Soall, Birmingham, secretary.

Victor Gherardi, a Young Sculptor, of Carrara, who is already well known in consequence of his collaboration in the decoration of the Church of St. Patrick, in New York, is now about to execute, by order of the Fine Art Commission of Chicago, a statue of Garibaldi. This monument, made entirely of bronze, will be erected in Chicago.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Sizes and Positions of New Windows in regard to "Ancient Lights."

Dulverton. — Exe writes: "Referring to the reply to my enquiry on page 127 of your issue for October 2nd, if the precaution you mention with regard to verified scale drawings showing the position of the windows in the old building are taken and a new building erected on the site of the old one, must the windows in the new building be of the same size and in the same position as the old ones (to prevent their being blocked by the adjoining owner at any future date), or may the total area of the new windows exceed that of the old ones?"

It would be unwise to alter either the size or position of the windows. Whether they were to be considered to be ancient lights or as new windows would be a point which, if taken into court, would admit of much argument, and the issue would be doubtful. As a general rule judges do not assist dominant owners to preserve these rights of easements so strictly as they used to do, especially where any attempt is made to enlarge an existing right. It should also be noted that any work of reconstruction should be done with moderate speed, as if by oversight or otherwise the window be out of existence for a whole year the right previously enjoyed would probably be held to have lapsed.

G. A. T. M.

Plate Glass and Temperature.

Croydon.—Enquirer writes: "Is it a fact that plate-glass windows tend to make the temperature of rooms more equable than the ordinary sheet or crown glass? If so, are there any means for discovering to what extent?"

To no appreciable extent; what little difference there is in the temperature is due to the thickness.

Restriction of an Architect acting as Clerk of Works.

Carlisle.—Simplex writes: "I am under agreement not to practise or be employed in carrying on the business or profession of builder, or architect and surveyor, or any other kind of business in competition with or in opposition to my employers. I now seek to become a clerk of works for a company during the erection of new premises (I am not to be the servant of the architect), but my employers dispute my right to do so. (*a*) Is it part of an architect and surveyor's business to undertake a clerk of work's work? (*b*) Is it usual for a firm of architects and surveyors to undertake a clerk of work's work or jobs where another architect of the same town is employed as architect? (*c*) Does the agreement prohibit me from taking up the duties of a clerk of works? (*d*) Would an injunction of restraint, with which I am threatened, be granted by a judge in such a case?"

It is always difficult, if not impossible, to say that a judge will certainly take a particular view of any case which may be submitted to him; but in the present instance there seems to be little room for doubt. The employers would probably have difficulty in upholding the restraining clause in any event, as it is drawn in an unjust and over-comprehensive spirit, but in the present instance they seem to be striving to apply it beyond even its very wide scope. The answers to the various definite questions therefore seem to be: (*a*) No; (*b*) No; (*c*) No; (*d*) Most unlikely. A local solicitor should be consulted to whom the whole agreement could be shown.

G. A. T. M.

Calculations in Designing Staircases.

Bristol.—E. E. M. writes: "Kindly give me an outline of the necessary calculations for the designing of staircases in cast-iron and steel?"

Staircases, of whatever material they may be made, are not usually the subject of calculation. In any particular case where it is desired to make calculation, as a check upon designing by the eye, the string is taken as a girder under distributed load equal to the maximum that can come upon it, the span being not the full length but the horizontal length between the supports. The factor of safety will vary with the material; say timber 10, cast-iron 6, wrought-iron and mild steel 4. Bent strings are calculated rather differently. The simplest way is to find the total load on support and then, taking this as reaction, find the bending moment at the knee of the string.

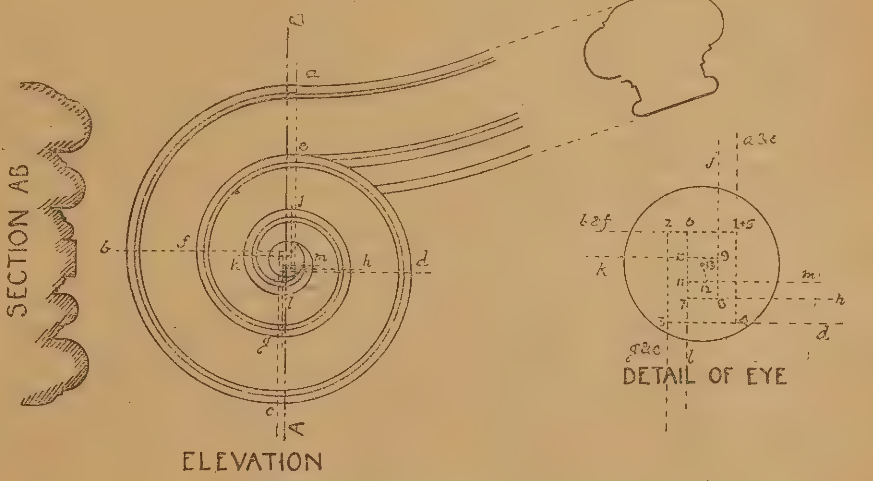
HENRY ADAMS.

Drawing Scrolls.

London, S.E.—G. W. writes: "Kindly give a quick and easy method of drawing a scroll for a handrail or other similar article. The methods given by various books consulted are too complicated and far from being easily remembered."

Naturally the quickest and easiest way to describe a scroll is to draw it freehand, relying upon your own sense of proportion for its correctness. Failing this, some such method as that given in the accompanying drawing must be adopted, but in this case the draughtsman will have to possess a passable knowledge of one or other of the mechanical methods of tracing a volute, as given in Normand's "Parallels" or Mr. Phené Spiers' book on the Orders. The principle involved is that of a circle divided into four parts by a vertical and a horizontal line passing roughly through the centre. Continuous quadrants of circles are then struck eccentrically and with gradually diminishing radii until the centre (or occulus) of the volute is reached. The volute here given was set out as follows: It was sketched *freehand* until it approximated to the required curve and was then divided into four segments by straight lines, and each quadrant was tried with the compass until its centre was found. Thus 1 (on detail of eye) was found to be the centre for a, b; 2 the centre for b, c; 3 the centre for c, d, and so on. It must be borne in mind that where two curves of different radii are continuous a line drawn from the point of intersection must cut the centres of both curves: *e.g.*, curves a b and b c, of different radii, meet at point b, and the line b 2 1 cuts their respective centres in 2 and 1, and similarly for each two curves.

R. W. C.



METHOD OF DRAWING A SCROLL.

Air-Space around Buildings.

Aberdare.—Cynow writes: "The enclosed plan of a house (not reproduced) is returned by the surveyor to an urban district council because it does not conform to section 58 of the council's by-laws with respect to new streets and buildings, and especially with the paragraph marked B. The by-law is as follows:—Every person who shall erect a new domestic building shall provide in the rear thereof an open space exclusively belonging thereto and of an aggregate extent of not less than 225 sq. ft., free from any erection thereon above the levels of the ground except a w.c. . . . (B.) He shall cause such open space to extend laterally throughout the entire width of such building, and he shall cause the distance across such open space from every part of such building to the boundary of any lands or premises immediately opposite or adjoining the site of such building to be not less in any case than 10ft. If the height of such building be 15ft., he shall cause such distance to be 15ft. at the least."

The particular cause referred to is based on clause 54 of the Model By-Laws issued by the Local Government Board. So far as can be ascertained from the plan submitted, the surveyor to the urban district council appears to be quite correct in pointing out that the plan does not comply with the local by-law mentioned. It is necessary that the required distance between the building and the opposite property shall belong exclusively to the building, and must not include any public road or passage at the rear of the building.

T. E. C.

Stable Drainage.

London, S.W.—G. A. P. writes: "I have some stable drainage arranged with drain pots to stalls and loose boxes inside the building, and disconnected from the main drain by an open gulley immediately outside the building, over which the drain pipes from pots to stalls, &c., discharge. Should this gulley be an ordinary trapped gulley, or a drain pot with silt-bucket, as used where stalls, &c., are drained by surface gutters? The drains outside the stable have a general fall of 1 in 40 and are not therefore likely to get choked with anything which could pass the drain pots and gulley. Inside surface drains are in this case strongly objected to and cannot be used."

The gulley outside the stable should be a trapped gulley, and fitted with a catch-basket or silt-bucket. The drain from the horse-pots should discharge under the surface grating of the outside gulley and immediately over the catch-basket. Suitable gulleys of this description may be obtained from Messrs. Broad & Co., or other manufacturers of sanitary appliances.

T. E. C.

Strength of Iron Tank.

London, E.C. — Hydraulics writes: "I should be glad to know how to calculate the weight on the sides of a cistern 20ft. by 10ft. by 6ft., and the strength of iron sides, &c."

There is much more in designing the tank than finding the pressure on the sides and the thickness of the plates. The designing of large tanks is work for a specialist, or at least for one with experience in designing or manufacturing them; so many points require minute attention, as witness the disastrous failures that have occurred at St. George's Hospital, the Crystal Palace, the West Ham Workhouse, &c. The pressure on the side of any cistern or tank containing water is—

$$\text{Area side, sq. ft.} \times \tfrac{1}{2} \text{ depth ft.} \times 62{\cdot}5 \div 2{,}240 = \text{tons}$$

and with any intermediate portion, such as the area supported by a stay, area × depth of its centre of gravity from surface × weight of a cubic foot of water = pressure in lbs. The centre of pressure is two-thirds of the depth from the surface, but this has no particular importance in tank designing. The writer's rule for thickness of plates in cast-iron is to make the top row ½in. thick and the bottom row by the formula—

$$t = \frac{d\sqrt{D}}{192}$$

where t = thickness of plate in inches; d = depth of plate in inches; and D = depth of lower edge from surface of water in feet: intermediate tiers to be graduated between these thicknesses and all plates to be properly stiffened by ribs, feathered flanges, and tie-bolts. In important cases the result should be checked by other formulæ. In the present case with a depth of 6ft. there would be two rows of plates, the top row ½in. thick, and the bottom row $\frac{36 \times \sqrt{6}}{192} = \frac{36 \times 2{\cdot}45}{192} = {\cdot}45$ which, being less than ½in., is to be increased to ½in. thick.

HENRY ADAMS.

Books for R.I.B.A. Preliminary Examination.

GLOUCESTER.—J. L. M. writes: "Please give me a list of the books necessary for the R.I.B.A. preliminary examination."

A list of books and advice to candidates is given in the R.I.B.A. Kalendar, to be obtained from the secretary of the Institute, 9, Conduit Street, W., price 2s. 6d.

Fees for Plans and Superintendence.

ABACUS writes: "I agreed with a client to prepare plans and specification of some houses, and to superintend their erection for the sum of £50. The houses are now being built, but the client states that my services are no longer required. No fault is found with me. I have received £20 on account; am I not entitled to the balance of £30?"

If the contract for the £50 was made either verbally or in writing, you are entitled to be paid in full. You do not state if the £20 was sent with the note of dismissal as in full settlement of account. If it was, or afterwards, and you signed a receipt, you cannot recover. If it was paid by cheque you should have returned it, as we think it would be held that acceptance implied full payment. If the money was tendered in coin of the realm and no receipt given, or only one as on account, you can sue for the balance. If the £20 was received on account before the note of dismissal, your case is strengthened materially.

On Becoming an Electrical Engineer.

BALLYMENA.—M. R. H. writes: "I am a matriculated student of the Royal University of Ireland. I am seventeen years of age and have spent one year in a civil engineer's office. I wish to pursue electrical or mechanical engineering and require information as to how to proceed."

Electrical engineers should first go through a course of mechanical engineering. They may then spend a few years on general electrical work and afterwards specialise in the particular branch which they favour. You should attend a technical school first, or enter some engineering works in your neighbourhood. When you have thus acquired a grounding, you may move to an electrical works. You will doubtless have to pay a premium, and during the period of apprenticeship you will earn very little money—less than 10s. a week. Sometimes it is possible to obtain a position as "improver," which means that you are fairly well versed in the technicalities of your profession, but need more practical experience. You might write for a prospectus of the Electrical Standardising, Testing and Training Institution, 8, Charing Cross Road, W.C.

Views & Reviews.

School Architecture.

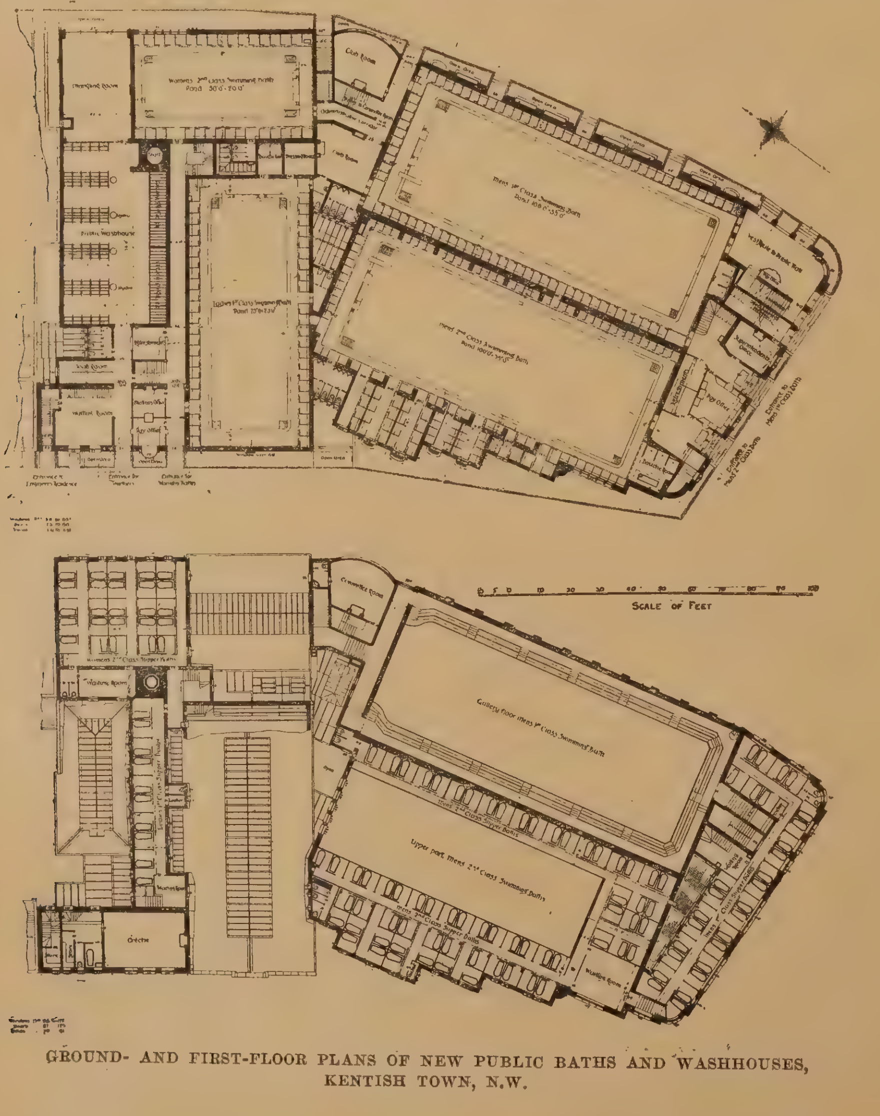
Compactness has been the aim of this book; in fact the subject of school architecture may be said to have been gone through, with American expedition, in about three hundred quarto pages. We fear that for the complete enjoyment and profit of the English student some considerable knowledge of things American is required, and it is almost a question if too much has not been expected of any reader who is not a school expert, so much has been taken for granted. The book, indeed, is that of an architect in practice; of one dealing with a subject of which he has special knowledge, derived from the designing and erecting of buildings of the class of which he is writing. The collection of plans will be of interest to any all-round architect, while the expert will turn in addition to the letterpress to gather the author's views on the current fads of the day in this particular subject. The author's desire has been to deal with the schools—elementary, secondary and technical—of the principal European countries as well as of the United States, but with the limitation that they are the schools of public authorities. This at once makes the English section very one-sided and incomplete, as the examples are practically limited to School Board schools. The author seems hardly aware of the early history of English popular education, insufficiently recognising the great part taken in it by the National and Voluntary schools before and after 1870; and we must express a doubt whether he has a very close knowledge of school work in England.

The points wherein American practice differs widely from our own are of some considerable interest. The author does not appear to be altogether satisfied with American practice, and calls for certain reforms, which appear to be difficult in view of established customs. Thus, the use of the single instead of the dual desk profoundly affects classroom planning; but it is a matter which the author takes for granted as fixed. Possibly social considerations are too much involved. The unfavourable way in which the classrooms are affected is in the lighting. Rooms 28ft. deep (instead of 24ft., as in England) are found to be inadequately lit, particularly as the heights are also lower, being only 12ft. or 13ft., as compared with our 14ft. The resort to windows on a second side, to remedy this defect, is condemned by the author on account of the glare in the teacher's eyes. He calls, therefore, for a smaller number in each class, less width in the room, and greater height.

A second point in which American practice differs from our own is in the provision of a cloak-room (or "wardrobe" as it is called) for each classroom, and usually entered from it, as well as from the corridor. The author condemns English practice in this respect on the ground of the loss of time arising from confusion in the files, but this surely is a matter of school routine and discipline. Unfortunately, in the United States (probably for climatic reasons) the lavatories, or "toilets," are often in the main building, and naturally the author is anxious about the sanitation and ventilation of these places. In connection with this and the last point he dwells on the urgent importance of developing the practice of school bathing, commending the German compulsory three-times-a-week shower-bath for all scholars. To the adoption of a rule of this kind he looks for the overcoming of the trouble known as "school smell," and certainly in these days of promiscuous travelling something of the kind is much needed, not in schools only, but also for factories and building works. A revival of the working blouse—still in use abroad, by the way—would be a sensible reform.

Inadequate playgrounds the author admits to be a weak point in the United States, and the rule of 30 sq. ft. per pupil is mentioned with approval. Some landscape-gardening treatment of the school site, such as is practised abroad, according to the illustrations given, is advocated.

The treatment of elementary schools occupies about half the book: the remainder deals with secondary schools, manual training schools, and training schools for teachers, concluding with a chapter on sanitation, and about twenty pages of a specification for an American school building;



GROUND- AND FIRST-FLOOR PLANS OF NEW PUBLIC BATHS AND WASHHOUSES, KENTISH TOWN, N.W.

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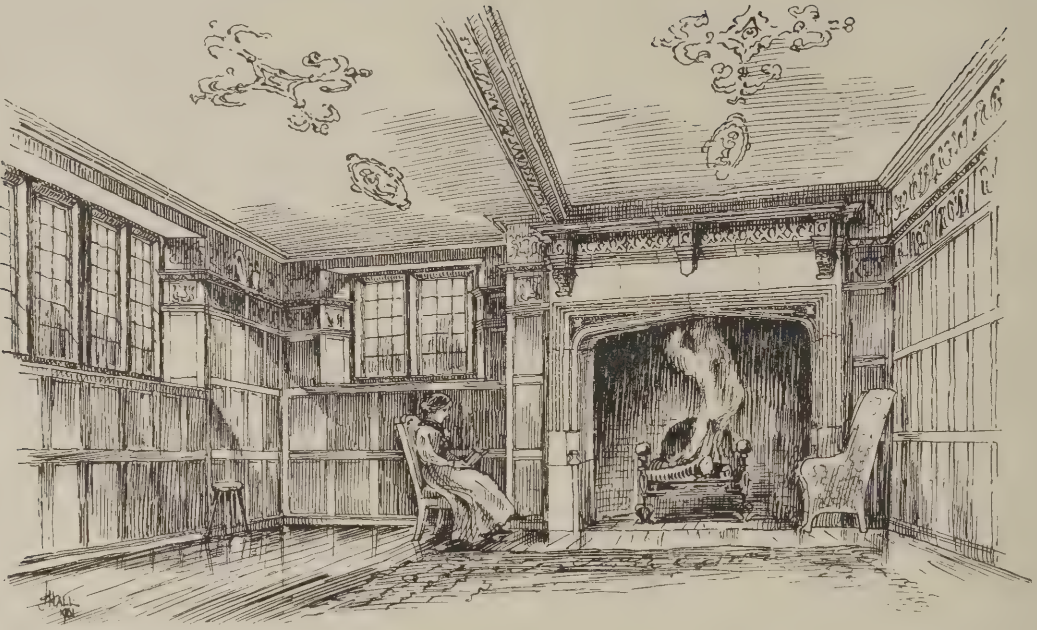
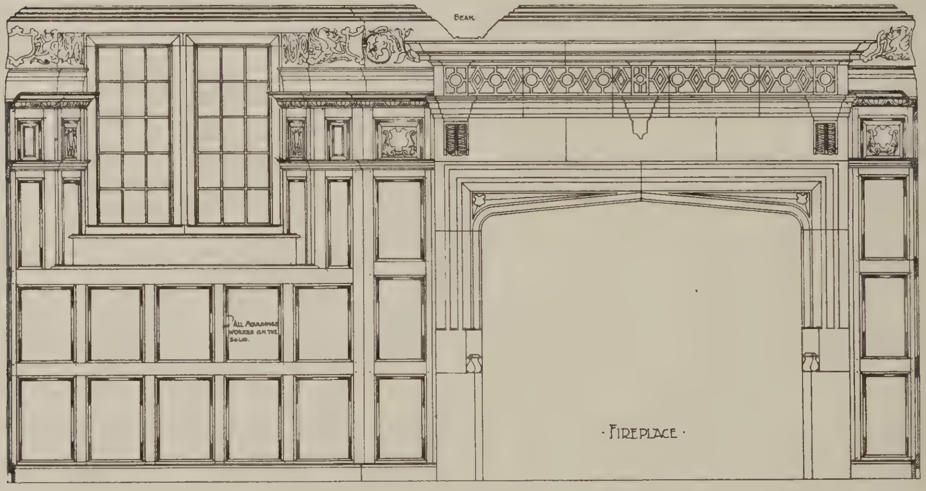
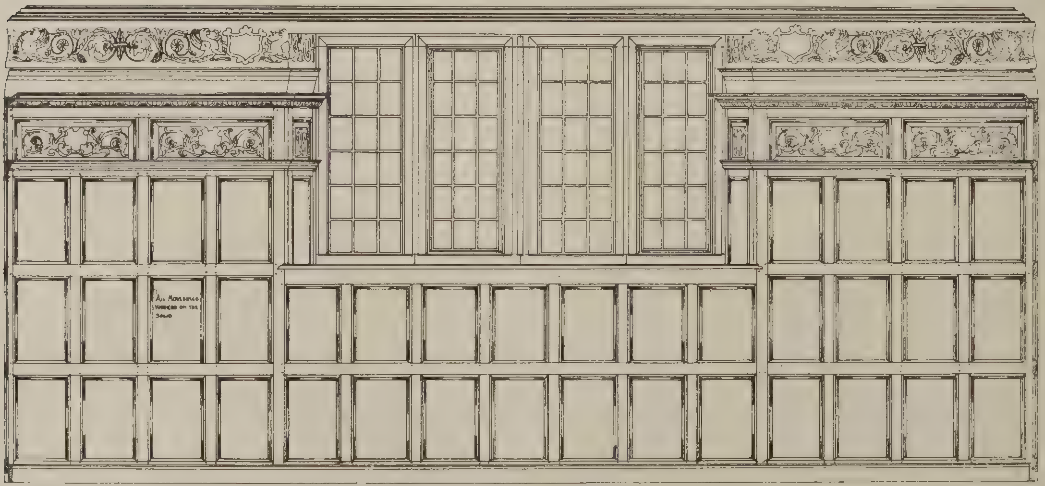
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, October 23rd, 1901.





THE DINING ROOM · COLES FARM BOX

SCALE OF FEET



Measured and Drawn by **HERBERT A. HALL.**

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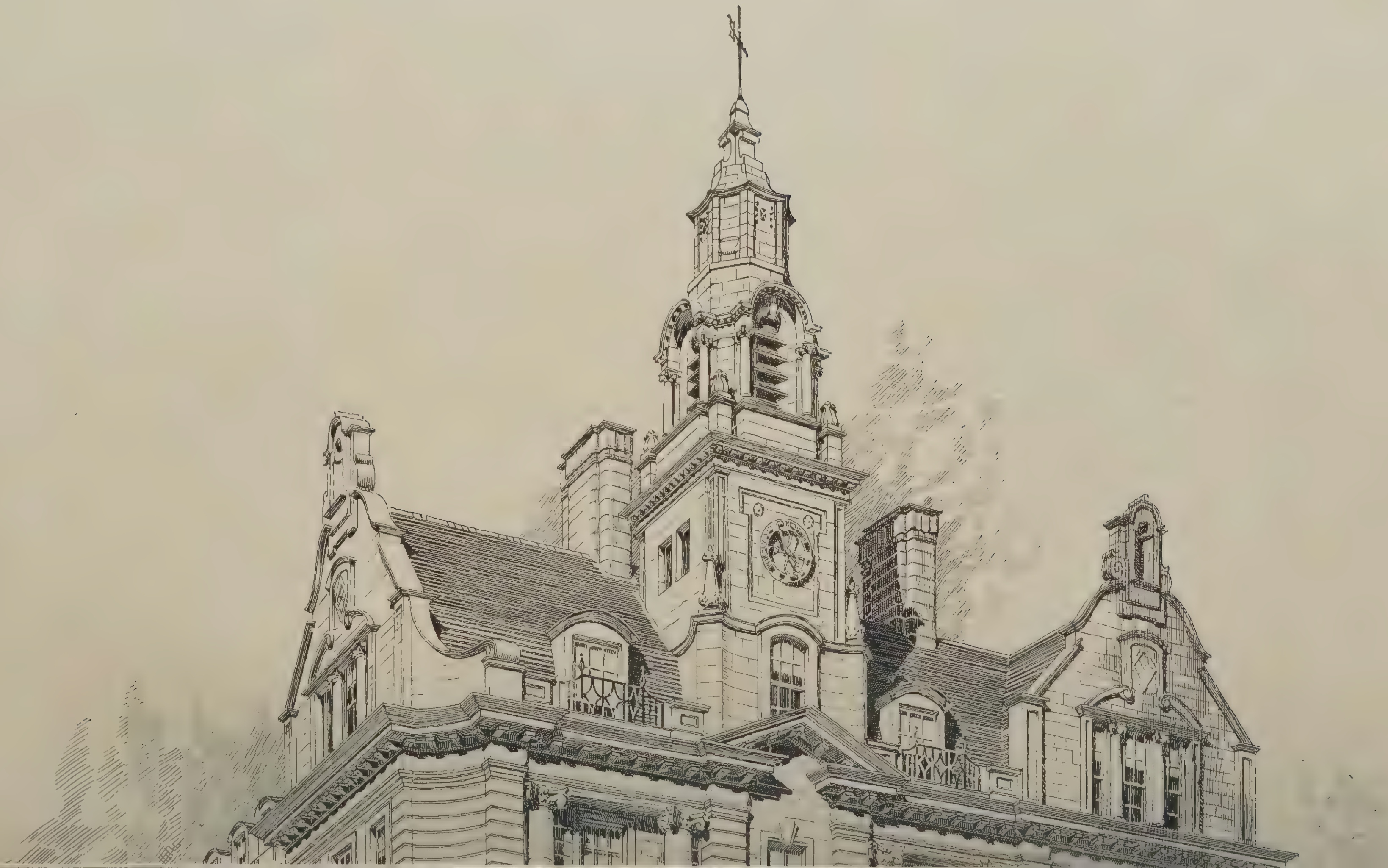

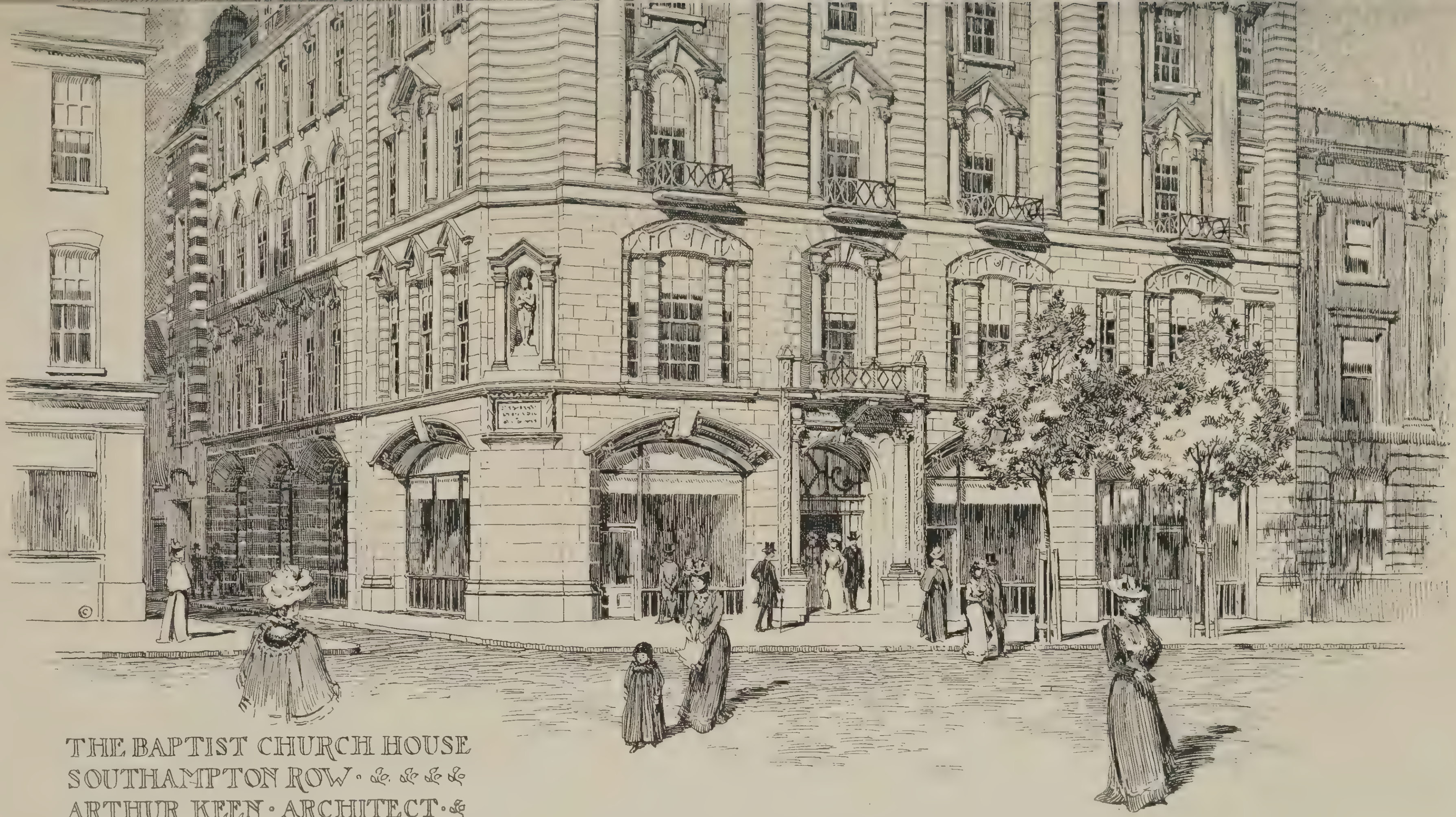

THE BAPTIST CHURCH HOUSE
SOUTHAMPTON ROW · ❧ ❧ ❧ ❧
ARTHUR KEEN · ARCHITECT · ❧
GRAY'S INN ·

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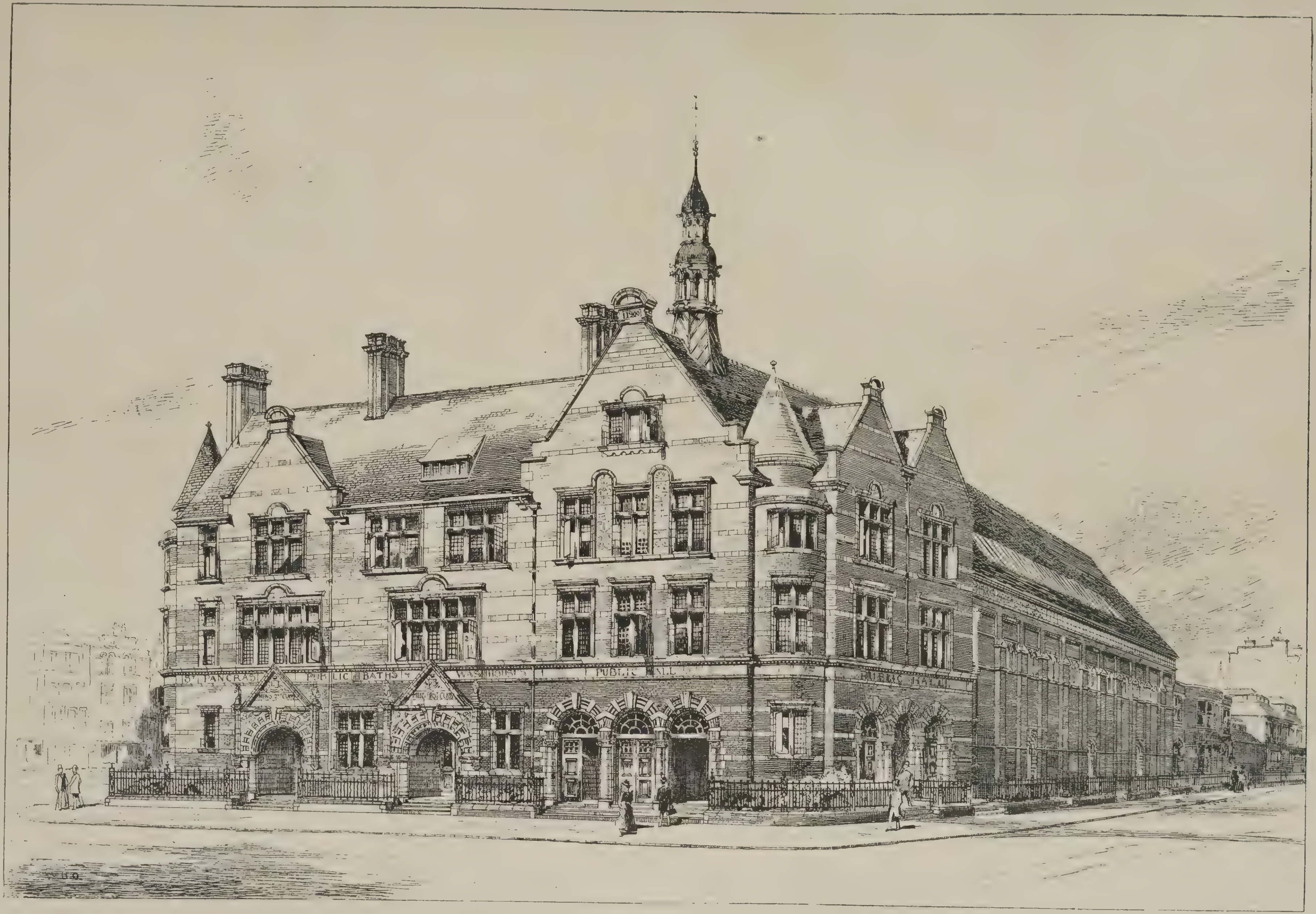

NEW PUBLIC BATHS AND WASHHOUSES, KENTISH TOWN, N.W. Thomas W. Aldwinckle and Son, Architects.

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this last will, we fear, be of little value to an English reader, as it is naturally expressed in American technicalities.

Of English secondary schools, the central school at Manchester, a proposed school at Chippenham, and the Cassland Road higher-grade Board school are given—assuredly a most inadequate treatment: but for this the limitation of the author's plan, as already mentioned, is responsible. In his eyes, in fact, English secondary education is practically non-existent. In the manual training section, the Mechanic Arts High School, Boston, designed by the author, is very fully illustrated. It appears to be magnificently fitted up, and the interior photographs show workshops that would gladden the hearts of our scientists, if they saw any prospect of getting similar ones over here. This building is in fact one of the best given. The design has far more expression of its purpose than would appear to be common in American school architecture, which seems to reproduce all the uncertainties and cross-currents of modern work in the United States.

French and German models would appear to be in favour, though it is hard to say why a free American citizen should want his children brought up in a school designed on the lines of a Continental barrack. The Croton school (p. 206), worked out on old Colonial lines, would be a good deal more wholesome to look at and to live in.

It is to be hoped the author does not give the full-page photograph of the courtyard façade of the Lycée Victor Hugo at Paris as a model for imitation. Most English students would agree that the tact and taste of the modern French architect, freely shown in the handling of masonry, absolutely deserts him in the handling of brickwork.

It is needless to add that English school architecture, as such, is badly represented in the book. The author might be advised on his next trip across to the old country to get some friendly native amongst its architects to show him round.

"School Architecture." By Edmund March Wheelwright, Fellow of the Boston Society of Architects and the American Institute of Architects. Rogers and Manson, 85, Water Street, Boston, Mass.

Stone Crosses.

This book, which is the elaboration of a paper which the author read before the local architectural society six years ago, should be read by all those who are interested in the stone crosses of Northamptonshire, especial those wonderful crosses erected to the memory of Queen Eleanor. Though the story is so well-known it will bear re-telling. Eleanor, it will be remembered, was the devoted wife of Edward I., whom she accompanied on his expeditions to Wales, Scotland and the Holy Land; and according to the legend she saved her husband's life at the siege of Acre in 1272 by sucking from his arm the poison of the assassin's dagger. Towards the end of 1290 Edward journeyed to Scotland to decide upon the rightful heir of that throne. Queen Eleanor went to meet him, but was stricken with fever on the way and died at Harby in the county of Nottingham. King Edward, "with great sorrow, for he bewailed the loss of her all the days of his life," determined to carry the remains to Westminster, and to erect a memorial cross "of wonderful size" wherever the corpse rested for the night. The distance by the old roads was about 159 miles, and it is said that the journey occupied fifteen days; but it is probable that only twelve of the crosses were actually erected. The sites of these were most likely at Lincoln, Grantham, Stamford, Geddington, Northampton, Stony Stratford, Woburn, Dunstable, St. Albans, Waltham, West Cheap and Charing. The Geddington cross (which has been twice repaired, once under the direction of the late Sir Arthur Blomfield) is generally considered to be the best of three Eleanor crosses still existing, though the Northampton cross with its beautiful statues calls for great admiration. This latter cross has been frequently restored and is now in the charge of the County Council. Besides these Eleanor crosses, the county of Northampton contains the remains of forty churchyard, ten market, twenty village and four wayside crosses, with sundry boundary stones. Among these are many fragments of Saxon work, such as the Nassington churchyard cross, while there are good examples of the Decorated and Early English periods at Raundes, Higham Ferrers, Irthlingborough and Helpston. No two are alike in design, the sockets even being quite distinct in shape and proportions. Many of the crosses have been restored at various times, though seldom successfully; but there is much beautiful work left untouched, and those who desire to study it would do well to consult this book, which is written by an authority on the archæology of Northamptonshire. There are numerous illustrations, but it is to be regretted that so many of them are such feeble specimens of draughtsmanship. The edition is limited to fifty large paper and two hundred small paper copies.

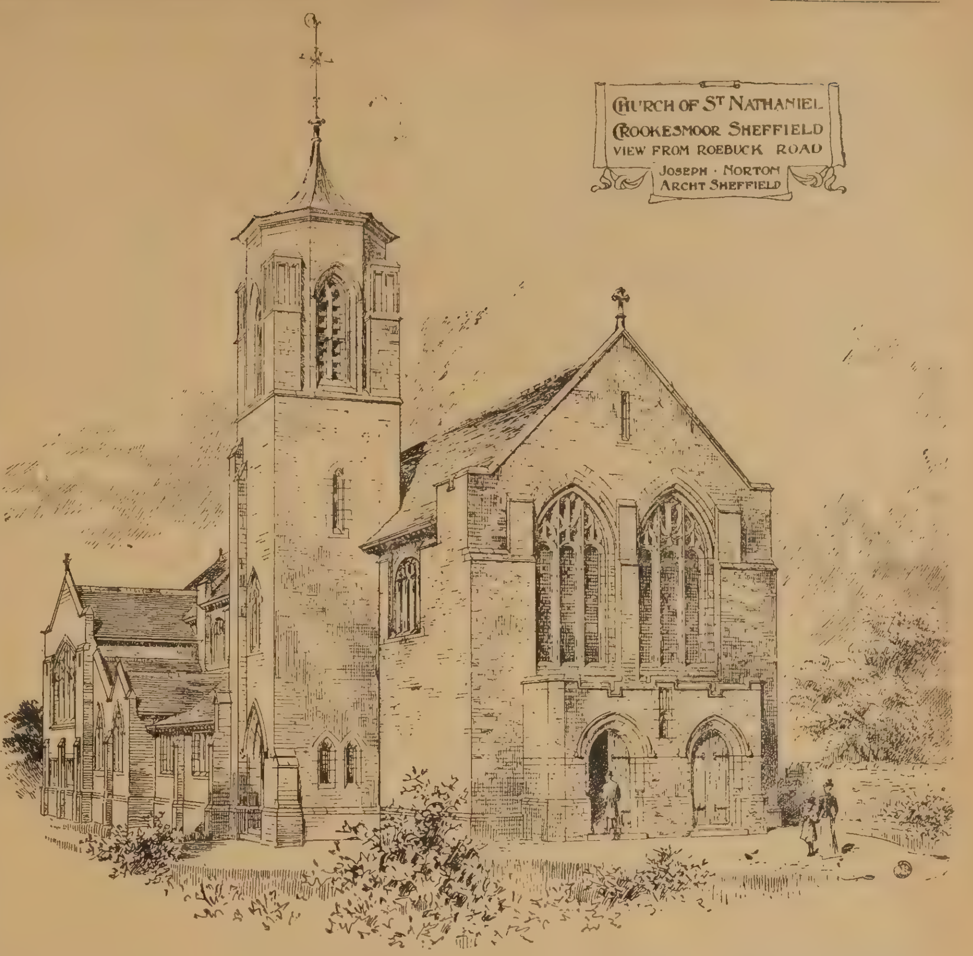
"The Stone Crosses of the County of Northampton," by Christopher A. Markham, F.S.A. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 4, Stationers' Hall Court, E.C., price 10s. 6d. nett.

The Orders.

This series of ten plates is admirably produced the drawings being executed in strong line and very clearly reproduced; they measure 15in. by 20½in. Only one example of each Order is given, but the selection is a good one and sufficient for all purposes. The columns are drawn to their full height, an advantage over other publications, as it enables the general proportions to be judged better. All the Orders are drawn to a module of thirty parts, each module being equal to the semi-diameter of the column, the three Grecian examples having columns all set out to one length and the Roman to another. The details are well drawn, being shaded in line. There is a constant demand for books on the Orders, owing to the various examinations insisting on a knowledge of them.

"Classic Architecture: A Series of Ten Plates illustrating typical examples of the Grecian and Roman Orders, with full details and a selection of Grecian and Roman Ornament." By Charles F. Mitchell and George A. Mitchell. Price 6s. London: B. T. Batsford, 94, High Holborn, W.C.

The Victoria Memorial Designs will be open to public inspection at St. James's Palace on November 1st.



NEW CHURCH AT CROOKESMOOR.

THE foundation-stone of the new Church of St. Nathaniel, Crookesmoor, Sheffield, was laid recently. When finished it will seat a congregation of 700. The building fund does not permit the signing of the contract at present for the completion of the church, but the nave is to be proceeded with first, so that that portion may be ready for consecration on June 30th next year. The church is now being built, about 75 yds. from Crookesmoor Road, and on the right-hand side of Roebuck Road, on a site containing about 1,360 sq. yds. of land, with a frontage of 20 yds. to Roebuck Road, and about 12 yds. to Chatwin Street. The church can be approached from both Roebuck Road and Chatwin Street, and has five entrances, four on the Roebuck Road level to the church, and one on the Chatwin Street level to the parish room and the church. The fall between these two streets has enabled the architect to provide a room under the chancel, which might be used as a parish—or school-room and for bazaars, &c. It is 12ft. high, and will accommodate 250 persons seated. A nave, 100ft. long, 30ft., wide, and 40ft. high, with side aisles, giving altogether accommodation for about 600, is the portion now being built, and it is proposed to add a chancel and transept, giving further accommodation for about 120, with organ chamber and vestries when further funds are available, if not while the present work is going on. The materials used in the building are Dunford Bridge stone for facings, Grenoside for outer dressings, and Monk's Park Bath stone for inside work, such as the nave, arcade, font, pulpit, &c., and the roofs will be covered with green Westmoreland slates. The seating will be part chairs and part pitchpine pews, giving the ample allowance of 20in. in width and 3ft. in depth to each occupant. The style of architecture is late English Gothic, of a plain type, with traceried windows of flamboyant character, and the architect is Mr. Joseph Norton, of Sheffield. The cost of the works already contracted for is about £4,500, the total cost £7,000, and good progress is being made by the contractors, Messes. D. O'Neill & Son. The accompanying block has been kindly lent to us by the "Sheffield Daily Telegraph."

PROFESSOR WALDSTEIN ON LABOUR AND ART.

AS the second of the course of Gilchrist lectures arranged by the Ince Technical Committee, the eminent authority Mr. Charles Waldstein, Litt.D., Ph.D., L.H.D., Fellow of King's College, and late Director of the Fitzwilliam Museum, Cambridge, and of the American Archæological School, Athens, etc, took as his subject, "Labour and Art in English Life, illustrated by Greek Art."

At the outset he remarked that the subject of "the beauty in work itself," which had been developed with such eloquence and depth in bygone days by the late John Ruskin, was not the side he wished to attack that evening. He wished to be less orthodox, more heterodox, because at the commencement he wanted to make an antithesis of his own, an opposition between work and play. He desired to dwell upon the relation between work and play—in contradistinction to work. One of the most important problems of life was the sense of proportion, and it seemed to him from his point of view that he was the wisest man who was most keenly alive to the sense of proportion in this life. Most of the misery, the petty annoyances, and even the great trials of individual life, as well as the life of communities, might generally be traced back to a want of this sense of proportion.

It might appear a paradox, but every man and woman to be normal and sane should have a fad, something which should engross the playful intellectual side of activity, in contradistinction to the merely gross pursuit of collecting pounds, shillings and pence. There were many powers in their modern life which militated against the proper balancing of those two sides, and one was the great sub-division of labour.

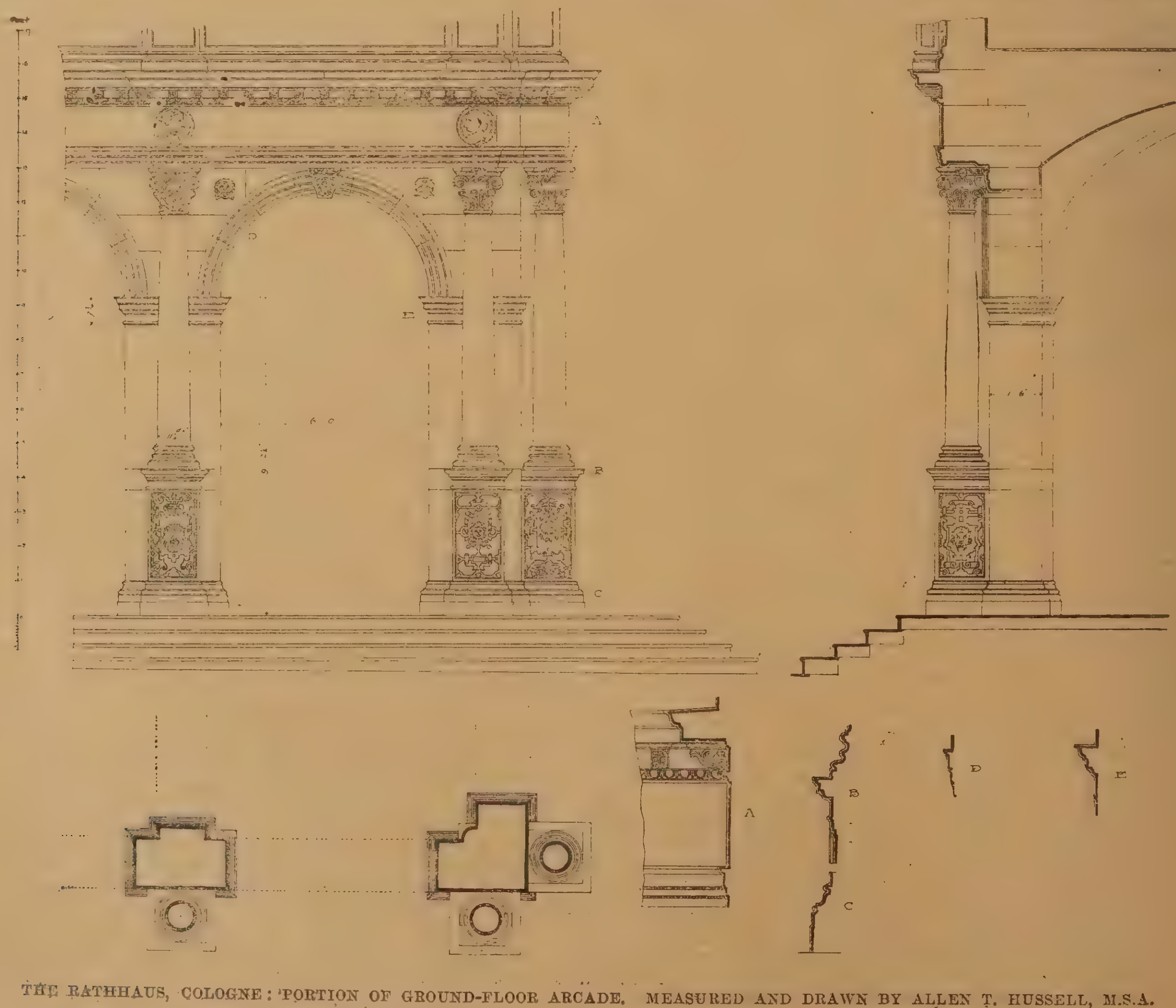
He was no romanticist, and he did not want to reproduce the simplicity of the bygone days, for they had their dark sides also. He was not dissatisfied with the present, and he was hopeful for the future. He saw nothing ugly in a factory chimney. It might be more beautiful than it is; but he could imagine a romanticist of a hundred or two hundred years hence standing before one of their ruined factory chimneys, as they at the present time stood before a ruined windmill, and referring to the beautiful days when the smoke went curling in graceful clouds from it.

Many of those who were listening to him were probably only half-an-hour previous by asking what Greek art had to do with them. But he would explain that it had much for them. The great Hellenic race was far beyond us in their just proportion of life. They were all-round beings developed on every side, strong physically, but developed normally and perfectly.

Art only required development. If they admired an apple for its rondeur and form, for its beautiful and delicate colour, that was not selfish. Develop that, and they would come to the highest art. A workman, in the selection of a pipe or stick, exercised his sense of proportion; he wanted his choice because the eye demanded it. The first and fundamental principle of all art was that of proportion and harmony, and going a step further they might call it beauty. Aristotle said, more than 2,000 years ago, that the great principle of art was the harmony between the form and the matter. In order that any of the arts might be perfect there must be complete harmony between the thing to be expressed and the form in which it was to be expressed.

At this point the lights were lowered, and a series of beautiful views of examples of Grecian art were thrown on a screen from an oxy-hydrogen lantern. They comprised examples from the very earliest times, the rudest forms of sculpture, and gradually the audience was led on to figures which gained more life and vitality as centuries rolled on. The splendid figures of the athlete throwing the discus preceded subjects more dignified, noble and restful, which reached their highest beauty in the great Attic schools of Pheidias. The Elgin marbles from the Parthenon at Athens, now deposited in the British Museum, received special attention. Many of the discoveries associated with the name of the lecturer were likewise shown; and the result of his excavations at Argos disclosed noble specimens of sculpture which exhibited the love the Grecians put into each detail of their work, although it could hardly be seen at the full height of the temple. These perfect decorations were executed 500 years B.C. A most interesting view was that of one of the marble statues found last spring by the sponge-divers in the Mediterranean, and raised with other objects from a ship which foundered in Roman times. The lecturer next spoke of the school of Lysippos, examples being given of this sculptor of the end of the 400th century B.C., when the figures employed were of slimmer and more graceful proportions than those of the preceding century. With the school of Pergamon and Rhodes came in sculptured groups which inclined to the dramatic and sensational. They represented scenes and events which could be told far better by poetry and the drama, and in these sculptured works art went beyond its bounds and really transgressed. Splendid though the studies in anatomy were, such work was obtrusive. They were anatomical studies and not the highest works of art. As art declined in this period, so did the intellectual life decline. The athletic games of the earlier and greater period of Greek history became subordinated to professionalism. To illustrate his point the lecturer had thrown upon the screen his final picture of a colossal Hercules, a mere hulk of flesh and muscle, developed and kept as prize hogs are kept, and indicative of the death of all athletic art. An eloquent warning as to the dangers of professionalism in British sport brought the lecture to a close.

The Rathhaus, Cologne.—This building has a fine Renaissance facade (date 1640) with good carving and mouldings. It is of two storeys, the upper one having slightly pointed arches not often found in buildings of this style.



THE RATHHAUS, COLOGNE: PORTION OF GROUND-FLOOR ARCADE. MEASURED AND DRAWN BY ALLEN T. HUSSELL, M.S.A.

BUILDING CONSTRUCTION.

(*Continued from p.* 134 *of No.* 347.)

16. *Friction.*—The resistance to the sliding of surfaces upon one another (fluid friction is a different thing) depends upon the nature of the surfaces and the force with which they are pressed together. Friction considered as a force is represented as μP, where μ is a number experimentally found (the coefficient of friction for the surfaces in contact) and P the pressure with which they are pressed together.

To determine μ experimentally, referring to Fig. 13:

The resolved part of W in the direction P is W cos α $\therefore$ P (pressure between the surfaces) $=$ W cos α.

The resolved part of W in the direction R is W sin α $\therefore$ R $=$ W sin α.

The force R is pulling the block down the plane and friction is opposing R. When the inclined plane is elevated till R just overcomes μP, $R = \mu P \therefore \mu = \frac{R}{P} = \tan\alpha$.

17. *Exercises.*—A, B and C (Fig. 14) suggest by their shape a roof-truss, an arched rib and a girder. The teacher, or the student for himself, should apply various systems of loading to plane rigid bodies of these shapes at the points marked by letters, or at other points, and he should by applying methods 1, 2 and 3 determine the balancing force. In this way the student will see for himself which is the best method in special circumstances. He should also practise resolving the balancing force in various ways to pass through the points of support; he will then see the effects of varying the horizontal thrust (where there is a horizontal thrust) in respect of each wall (assuming the truss to rest on side walls). In roofs the horizontal component of the balancing force appears when we take account of wind-pressure, but other forces may be applied to roofs which are not purely vertical gravitation loads.

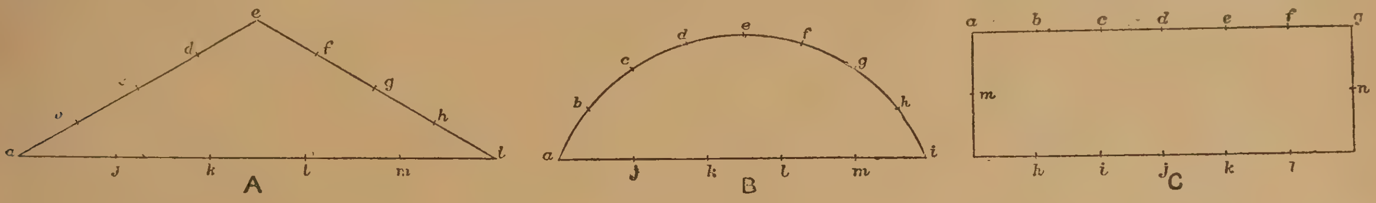


FIG. 14

FIG. 13

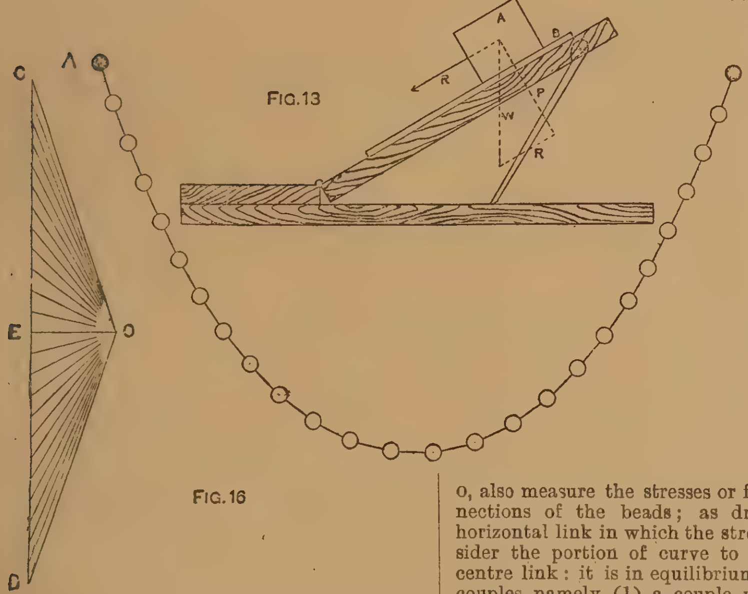


FIG. 16

I might prepare diagrams of numbers of trusses and girders variously loaded, and work them out for students to copy, but I put small value on copying diagrams as an educational exercise. Later on I shall show the usual loads upon trusses and braced girders.

18. Fig. 15 illustrates how a pair of forces nearly parallel may be conveniently compounded. It may be easily be seen that this construction will serve for parallel forces. Students should do a few exercises which they can set for themselves in compounding parallel and nearly parallel forces. Remember the lines of action are supposed to lie on a plane rigid body, and that it is the equilibrium of this body which is in question.

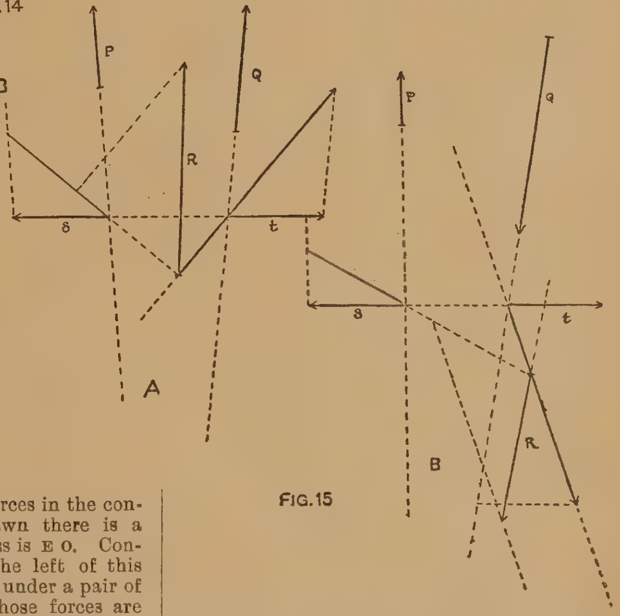


FIG. 15

19. *Loaded Strings.*—Suppose (Fig. 16) a string loaded at equal intervals, with equal beads, and hung up at two points A and B, it will take the curve shown in the figure; the slopes of the string between each pair of beads are given by the series of triangles having a common point O which show the forces at each bead. The particular curve shown is called by mathematicians a *catenary*, or chain. It is obvious that a chain will hang from two pins in a curve of this kind. The forces at each bead are in equilibrium, and their directions may be reversed so that if the little parts of the string between the beads are changed into wire, the curve with its loads might be turned upside down and the forces would still be in equilibrium. This could not be managed, because it would be a case of very *unstable* equilibrium, fine wires abutting against smooth beads and having their centres of gravity high over the points of support. But if the parts, the beads and the wires are made of reasonable cross-sectional area, and have plane joints at right angles to the curve at each joint, we can set up a structure that will stand—an arch formed of voussoirs all of equal weight. The sides of the triangles, whose common vertex is O, also measure the stresses or forces in the connections of the beads; as drawn there is a horizontal link in which the stress is E O. Consider the portion of curve to the left of this centre link: it is in equilibrium under a pair of couples, namely, (1) a couple whose forces are each equal to the weight of the curve; and (2) a couple whose forces each equal E O: this is the horizontal component of the pull upon the pin A. When the curve is set up as an arch, the arch has a thrust of this amount, and we learn that *an arch much spring from an abutment* fit not only to bear the vertical load due to the weight but also this horizonal thrust. This catenary curve is only a special case; the string may be loaded to give any curve whatever. We have found it useful (paragraph 10) in the graphic determination of balancing forces to suppose the known forces transferred from the rigid body to a string (funicular polygon); we shall find it of further use in connection with the design of arches.

Fig. 17 shows the elevation (part sectional) of a stone arch of moderate span. We take a slice of the arch parallel to its face, say 1ft. thick, and consider its strength and fitness. The string polygon below is made to fit into the centre line of a section of the voussoirs inverted. The diagram A gives the stresses in such a string, assuming the loads to be vertical. The diagram B gives the stresses when the forces are nearly at right angles to the curve. Diagram A shows how, as we go closer to the springing, if we attempt to do all the work by vertical loading, the loads needed become heavier and the stresses greater; and by no loading, however great, can we get the end element of the string vertical. This emphasises what I have already said, that every arch needs an abutment; by no arrangement of joints and by no increase of load can we get rid of the thrust of the arch. The haunching and filling distribute the load as shown in diagram B, which may fairly be taken as illustrating the condition of ordinary bridge arches of moderate spans.

The diagrams are for *dead loads.* The student may profitably exercise himself in drawing diagrams showing the changes in the polygon for the different positions of a live or changing load.

20. It is a rule that the polygon should lie within the "middle third" of the depth of the voussoirs, and I shall explain this rule. It will be useful to more closely consider the idea of the distribution of force or pressure over an area. When we push against anything with our hand our palm yields to the pressure, and a considerable area comes in contact with the surface pushed, but the pressure is not a uniformly-distributed pressure. If we set a cubical cut-glass ink-bottle on a hard surface, we shall find that though the ink-bottle is reasonably steady on a wood table it will not fit the hard surface, but will rock slightly when pressed down with the hand. The weight of the ink-bottle and the hand-pressure are communicated to the surface at three points, and the rocking results from changing directions of pressure varying one or more of the points. The reason for its not rocking on the wood is that the wood yields slightly—just as our hand does: the parts that yield most bear a greater pressure than those which yield less, and the pressure is not uniformly distributed. If we form a bed of Portland cement between the hard-surface and the cube—which we may now suppose to be a block of stone—we may assume that the cement squeezes into the slight inequalities of the surfaces, and that when this sets the pressure or weight of the cube is uniformly distributed. As we may imagine the weight of the cube as acting at its centre of gravity, we draw a line from the centre of the cube at right angles to the face on which it rests, which we assume is horizontal. This is the line of action of a force equal to the

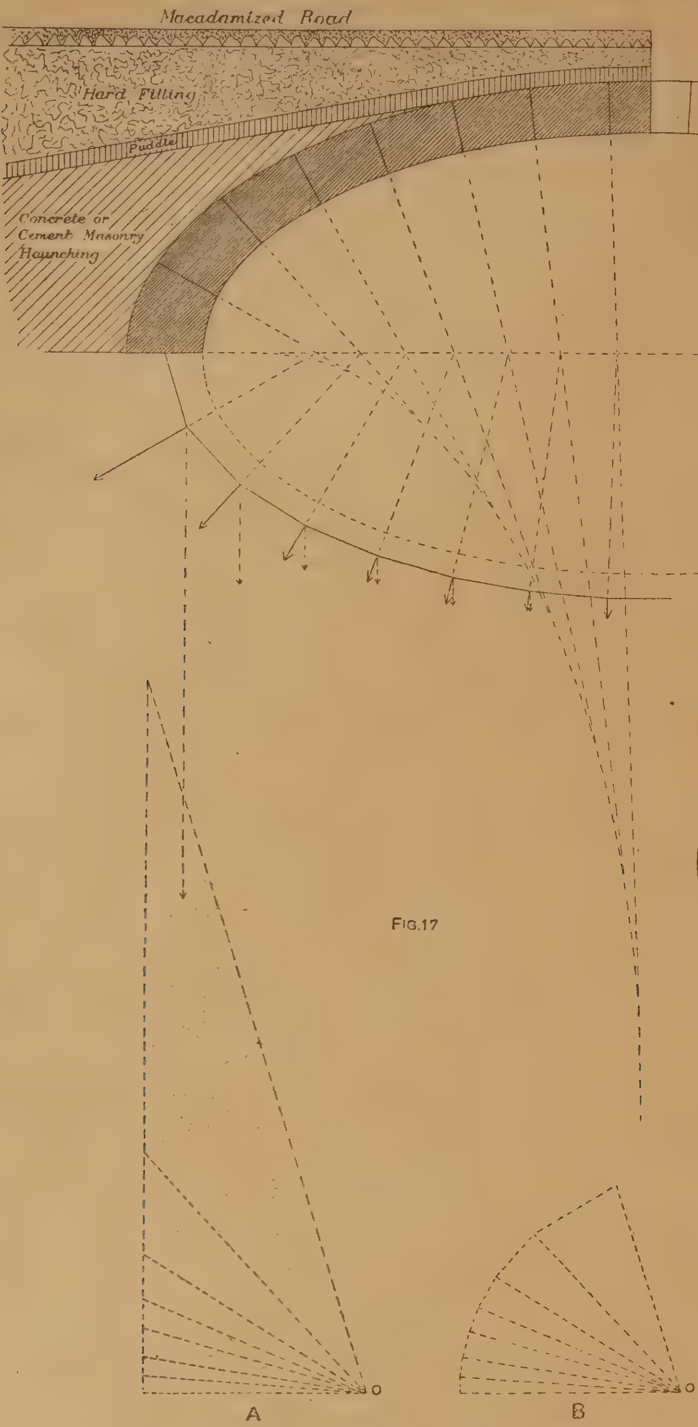


FIG. 17

FIG. 21

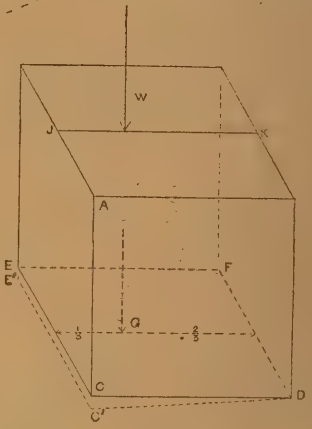


FIG. 19

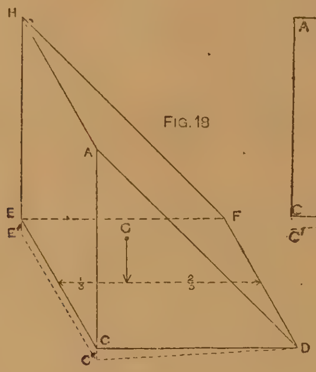


FIG. 18

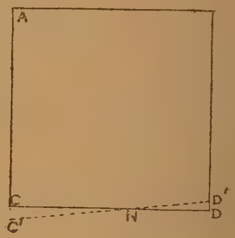


FIG. 20

weight of the cube, and we take this force to be *uniformly distributed* over the lying face of the cube. Now, if we cut the cube in half, making the section through two horizontal edges (see Fig. 18), removing the top half we shall have a wedge or prism A C D E F H remaining, whose weight is one-half that of the cube and which is now not uniformly distributed. The pressure along the line C E is the same as it was before the cube was cut, and it varies uniformly to the line F D, where it is nought. The centre of gravity of the prism A C D is vertically over a point which is one-third of the distance of E C from F D, and the distribution of pressure is that of a force equal to half the weight of the cube applied at a point G. Now, by Hooke's law every substance yields to pressure in proportion to the pressure, so that there will be some yielding along the line C E, which will uniformly get less along parallel lines as we move to D F, where it is nought. Let us again revert to the cube, and suppose we apply a vertical force W to its top surface along the line J K (Fig. 19) at such a point as that the line of action of this force, combined with the weight of the cube, will pass through the point G, we have now the same kind of distributed force that we had with the half cube, and we have the line C′D showing in an exaggerated manner the new position of C D when the compression has taken place; and because C′D lies altogether below C D the distributed force is wholly compressional. If, however, the force W is moved nearer J, the line C′D will not continue to be below C D, but will cross it at some point N (Fig 20), and the meaning of this is that the pressure per sq. in. having passed through the value nought at N changes the sign in N D′; that is, the distributed stress in this region is not compression, but it is tension, and it is exerting a pull on the cement bed here. As stonework is not supposed to bear tensional stress, care is taken to avoid the condition shown in Fig. 20. If the pressure W is very great compared with the weight of the cube, the point of application of W should not pass beyond the middle third of the cube.

21. If we consider road traffic over bridges of various spans, the traffic, or the varying load, is nearly the same for all, but the dead load varies very much. For small or common bridge spans, say up to 30ft., it adds very little to the cost to have the sheeting deep and strong. The ratio of live, or varying, load to dead load on such bridges is comparatively large. Where there is no question of *opening* for traffic through bridge arches, and where it is merely a question of economy, the designer will compare the cost of numerous piers of small size with that of a few large-size piers and heavy abutments and also that of superstructures. The wider the span the more nearly the problem becomes one to make the bridge able to carry its own weight, and consequently, for wide spans, diagrams are of great importance, as showing how to make the best distribution of the material. I am now speaking of stone bridges in which the material is all disposed so that it will have to bear compression stresses only. We here meet a subject which could not be properly dealt with in these elementary articles, but some things may be profitably said about it. It is evident to everybody that there is a limiting span for every kind of material. Why is this? Suppose we attempt to make a wider arch than Fig. 17 in the same proportions. The resistance of the material to crushing is taken to be proportional to the surfaces at the voussoir joints (or beds). The weight of the bridge increases as the *cube* of its linear dimensions, and these surfaces increase as the square, that is, at a less rapid rate. When we reach the limit for a material whose

weight bears a given ratio to its resistance to crushing, we can only bridge wider spans by adopting a material which has a smaller ratio, and our limits are very much extended when we use a material like iron or steel, which, besides having the ratio $\frac{\text{weight of a cub. in.}}{\text{crushing load per sq. in.}}$ very small, may also be depended upon to bear tensile stresses equal to the compression stresses. A steel structure of given design has also its limiting span. It is of use to designers of structures to note how animals of very different sizes, as a horse, a dog, a hare, run with nearly the same speed; or how our largest animals, as whales, live in water and are subject to the same conditions as our largest moving structures, ships. Our largest land animal, the elephant, is built like a bridge on two abutments. Our largest flying bird is of no very great weight. Why do particles of gold leaf float about in the air? Why does No. 8 shot have a much shorter range, with the same muzzle velocity, than No. 1? We sometimes see fanciful statements about the superior strength of small animals—for example, fleas—and comparison made with man. "If a man could jump as many times his own height as a flea can, and come down as safely, he could leap over high houses." A flea raises a definite mass a definite height by a definite effort. A man raises the same mass the same height by the same effort; because, if we can imagine as many fleas as would amount in weight to the weight of a man making a simultaneous jump, they would raise the common centre of gravity no higher than a man, jumping, will raise his centre of gravity.

22. The student cannot too carefully examine the reasoning of section 20. This question of distribution of pressure is very important and it has to do with many things besides the sheeting of bridges. I have taken some pains to make the explanation clear; it is slightly different from that usually given.

We can design stone arches which shall be safe for considerable spans where we can be sure of the foundations of our piers and abutments; it is manifest that any considerable unequal settlement will do away with the value of our theories of middle thirds. The student should make drawings of arches supported on piers and abutments, and investigate what will happen for various kinds of settlement. Where the foundation is in the least degree doubtful, wide-span stone arches should be avoided. It will be of great use to consider the behaviour of sheetings made up in half-brick rings under settlements of various kinds. While the sheeting is building, its weight is carried on the centres, and if the centres rest on supports independent of the piers and abutments the weight is kept off these till the centres are struck, and the striking of the centres may set up a very different condition of matters. We still speak and think of these questions under the influence of traditions of common mortar. The use of Portland cement has modified things very much, and it is worth while revising old instructions. The old question as to the propriety of bonding between intrados and extrados of sheeting in half-brick rings is practically disposed of if we build with cement mortar, using plenty of it, because we may have in this way a concrete arch with brick displacers. We must distinguish between settlement due to the strain of the material, when stressed by pressure, and the yielding of the stratum on which the structure rests. It is a good rule to carry the centres on the piers and abutments, because the weight is all the time on the foundations, and they are tested as the work proceeds. The centres of the sheeting should be struck before the spandrels are completed and the strings laid and parapets built, or these will show a sag over the crown of every arch. A critical examination of bridges will show that this last precaution is very frequently neglected. This fall of the crown, due to strain, to some extent counteracts the bad habits of masons in their endeavours to show fine joints, because it flattens the curve and consequently relieves the pressure at the face of the intrados. I am in favour of fairly rough dressing of beds and joints of stones, and of fairly thick beds and joints of cement mortar—using slow-setting cement; and of striking the centres within a moderate time of setting the keying courses, so that there may be a slight yielding of the mortar of these courses. Sheeting should be brought up simultaneously from opposite skewbacks, so that the centering will be symmetrical when strained with the weight of the stonework resting upon it. The stability of oblique arches is rendered more independent of accurate stone-cutting by the use of cement mortar.

23. Much that I have said in regard to bridge arches applies with obvious modifications to flying buttresses and vaulting. I have assumed that stone is not expected to bear a tensile stress in heavy work, but stone is frequently used in places where it is quite legitimate to make use of its power to bear tensile stress. We have seen that every arch built in the ordinary way needs an abutment, but there are circumstances in which we have to span openings in stone where it is inconvenient to have abutments; in these cases stone lintels may be used, and we shall see that beams are stressed in tension as well as compression; but it is not always easy to get long stones suitable for lintels, and I have seen (over fireplace openings especially) some beautiful examples of notching one stone into another. The pleasure I have felt from seeing instances of this kind convinces me that much of our sense of beauty is owing to our perception that the constructor has clearly understood his circumstances and honestly made the most of them.

One takes pleasure in the beautiful joggling of the despised Mahometan. I confess to feelings of anything but pleasure in examining the lintels of the stone-lintel city of Glasgow, for example. It will be observed that a great many of the stone lintels (almost all of them) are broken, and this is wholly due to unscientific building. Why will builders take precautions to prevent stone window sills breaking across, and take no precautions in regard to lintels? It will also be observed by the diligent student that there is much splintering showing on smooth ashlar in such stone cities: all this is the result of culpable carelessness. I remember examining a building in France—a church in Marseilles—in which precautions against splintering were followed to an extravagant degree. I do not advocate this for all purposes, but I confess I experienced great satisfaction in contemplating this large example of the finest ashlar masonry that I have ever seen.

24. The thrust of a dome may be taken by a hoop—I may say that I have made some use of this principle in concrete construction. I shall probably refer, further on, to combinations of cement masonry and concrete with iron. I desire to emphasize the saying "iron and Portland cement go well together" (iron does not appear to rust badly in contact with Portland cement). It is profitable to consider the stress produced in a hoop by a pressure at right angles to its inner face.

Suppose we have a hoop (Fig. 21) whose radius is R inches, and the total pressure outwards, distributed round it, is P. Suppose the pressure P prevails over the resistance of the hoop to a small distance k, so that the new radius is $R + k$, the circumference changes from $2\pi R$ to $2\pi(R + k)$ and the difference is $2\pi k$—that is, P has prevailed through a distance k, and the resistance of the hoop to stretching has been overcome through a distance $2\pi k$. By the principle of works the hoop is stressed by the force $S = \frac{P}{2\pi}$, and it must be made strong enough to withstand this stress (with a sufficient factor of safety); if the depth of the hoop be 1in. the pressure p per sq. in. is $p = \frac{P}{2\pi R}$ $\therefore$ $P = 2\pi Rp$ $\therefore$ $S = Rp$. For example, suppose $p = 50$lbs. and $R = 120$in. $S = 6{,}000$lbs., say $S = 2{\cdot}68$ tons. At 4 tons per sq. in. section the hoop should be ·67in. thick.

(To be continued.)

As a Memorial to Cardinal Newman it is proposed to erect on the site of the present Oratory Church of St. Philip Neri a worthy building. The cost of the scheme is estimated at £23,000. Mr. E. Doran Webb, F.S.A., has been entrusted with the preparation of the plans, which comprise a tower having to the right a Lady Chapel and a Chapel to St. Philip Neri, and around the church will be smaller chapels and altars. The high altar, recently presented to the Oratory Fathers, will be a feature of the new building.

New Patents.

These patents are open to opposition until November 25th.

1900.—Ventilating Rooms.—12,935. T. A. Frame, 19, Adelaide Street, and J. Hickson, 4, Nelson's Terrace, Greystone Road, both of Carlisle; and G. Goldie, 17, Cliff Villas, Manningham, Bradford. A series of holes or passages are made obliquely through the meeting bar of a sash, or in the atransom of a door having a fanlight over, so that air may be admitted without draught.

Brackets for Flushing Cisterns.—16,793. R. W. McDonald, 3, Lambeth Hill, Queen Victoria Street, E.C. Frames are attached to the brackets for the purpose of holding decorative tiles, or the brackets may have the necessary supports cast on them.

Windows.—17,008. W. K. Lee, 89, Cardiff Road, Aberdare. Each sash fits into two lifts which are connected by lines to the weights in the ordinary manner. The sashes are attached by means of a stud and thumb-screw. They can thus be removed from the frame without interfering with the cords or beads.

Decorating Wood.—20,874. E. Milo, 31, Musard Road, West Kensington, and E. J. Richardson, 41, Brook Street, Grosvenor Square, London, W. This invention relates to a process for decorating wooden surfaces with a pattern that penetrates right into the fibres, so that the wood may be washed or otherwise cleaned without injuring the design. The wood is first impregnated with alum to prevent the ink running. The design is then traced on this prepared surface, either by hand or by mechanical printing or transfers. A stain for the ground colour is then applied, after which the upper protective coating which has been used is washed off, so that the pattern appears with the clear natural colour and structure of the wood. Finally the surface is impregnated with oil.

Automatic Bricklaying.—23,084. J. H. Knight, Barfield, Farnham, Surrey. This invention relates to previous patents numbered 21,823 of 1899 and 5,169 of 1900. In order to do 14-in. work with a 9-in. machine, this latter (which consists of a hand-operated arrangement of levers and wheels working on a toothed girder) is moved laterally or transversely on a frame.

The following specifications were published on Saturday last, and are open to opposition until December 2nd. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1900.—16,896, Davidson & Don, flushing cisterns. 16,960, Thorne, acetylene generators. 17,132, Stanley, manufacture of tiles, &c. 17,378, Kronstein, manufacture of varnishes. 17,496, Hirst & Bevis, ceiling roses for electric lamps. 17,743, Grundy, Grundy & Grundy, automatic water-taps. 18,822, Snyder, pipe-union. 19,535, Winkler, incandescent gas-burners. 20,290, Aston, lifts. 20,291, Musto, Musto & Jones, road scarifier. 20,453, Wayss, ceilings. 20,674, Tullis, public washhouses. 21,039, Hicks & Holmes, levels. 21,496, Friswell & British Uralite Co., Ltd., manufacture of refractory materials. 21,527 Allen, glazing of greenhouses, &c. 23,574, Stein, iron shaft-furnace for burning cement and lime.

1901.—937, Excell, drawing squares for determining slopes and batters. 2,178, Sharp & Eatwell, drying bricks and tiles. 5,370, Goodwin, doors. 7,696, Foster, valves. 9,664, Schmitt, acetylene gas apparatus. 10,844, Siepen, lime kilns. 10,930, Alton, incandescent gas lamps. 11,285, Tope, kilns. 11,504, Leroux & Carmien, apparatus for heating and incandescent lighting. 13,880, McFarland, protractors and tools for setting out metalwork such as pipe elbows. 14,463, O'Rourke, subterranean or subaqueous dam or foundation construction. 14,566, Tassain, glazing of conservatories, &c. 15,673, Haucke, paper for the photographic copying of line drawings. 16,721, Schietkiewicz, apparatus for making foundations in sandy and gravelly ground. 16,940, Pearce, locks. 17,056, Howson, flushing apparatus for water-closets. 17,162, Justice (*Mississipi Glass Co.*), apparatus for making corrugated sheet glass.

Keystones.

A New Church at St. James's, Pockthorpe, Norwich, is to be erected.

In the Old Stepney Church recently burnt down there was an ancient stone which was reputed to have belonged to the city of Carthage.

A New Board School at Blackpool is being erected in Devonshire Road to accommodate 1,046 children. The contractors are Messrs. J. Parkinson & Sons, and the architect is Mr. H. Wade.

"Where Londoners should Live" is the title of a pamphlet by W. Gilford, of Redhill, Surrey, price 3d. It consists largely of excerpts from many authorities dealing with air, sites, water and other matters. It is obtainable from the author.

A New Church at Buckland, Dover, to be dedicated to St. Barnabas, is being erected. The first portion to be ready next summer to accommodate about 250 persons will cost about £5,000. Mr. B. Ingelow, of 4, Regent Street, London, is the architect and Mr. P. W. Paramour, of Dover, the builder.

The Norman Church of Kilham, East Yorkshire, which, at the request of Archbishop Gerard, was given by Henry I. to the Dean of York, is undergoing restoration by instalments. The nave has been reseated in oak, the west window opened out, and a vestry constructed under the Norman tower. The entire scheme is to cost £2,000.

The New Royal Victoria Theatre at Wingate, erected on the site of the old theatre in Front Street, was opened recently. The new building comprises a large hall with seating accommodation for 600 persons, and a stage 33ft. by 18ft. with a 22ft. opening. There are four dressing, rooms for the artistes, all the buildings being efficiently lighted with gas.

A New Liberal Club at Shepshed is being erected. The building externally is faced with Messrs. Gibbs' red sand stocks, and will be roofed with Bromley tiles. The upper part of the front is to be half-timbered, the spaces between the timbers being filled with rough-cast. The builders are Messrs. Atkin Brothers, of Shepshed, and the architects Messrs. Barrowcliff & Allcock, of Loughborough.

The Restoration of the First Presbyterian Church, Armagh, Ireland, which has been damaged and partly blown down by storm and lightning, has been entrusted to Mr. William Brown, of 55, Beechy Street, Oldham. He has to take down about 30ft. of the damaged stonework of the spire, restore it and put a new vane and lightning-conductor on. The architect is Mr. H. C. Parkinson, of 11, College Street, Armagh, Ireland.

The New Church of St. Matthew, Willesden, was dedicated recently. A portion of the design is only as yet completed, consisting of the chancel, morning chapel, transepts, and two bays of the nave, providing accommodation for 500 people. The total cost will be about £7,000. The architect is Mr. W. D. Caröe, architect to the Ecclesiastical Commissioners. No vestries or organ chamber have been built at present, for which a sum of about £1,500 will be required.

The Roman Station of Amboglanna, the largest on the famous wall which marked the limit of the Roman province, has just been sold by auction. After an existence of 1,800 years the walls of the station, 5ft. thick, are in a wonderful state of preservation. The gateways are noble specimens of Roman work; some of the wedge-shaped stones used in the arches are still to be seen on the ground. The interior of the camp is marked with lines of streets and the ruins of buildings. The estate which claimed this was sold for £8,000.

Mattishall Church Tower.—Not long ago the fine church of All Saints', Mattishall, Norfolk, was restored at a cost of over £3,000, and the architect now reports that the tower is in such a serious condition that it may collapse at any moment. Its fall would involve the destruction of a large portion of the body of the church. Strong buttresses at the north-western angle have hitherto prevented the catastrophe, though the stair turret is in a ruinous condition. It is estimated that a sum of £800 or £1,000 would will be required to strengthen the tower.

The Church of St. Stephen's, Bournemouth, was consecrated recently. The foundation-stone was laid twenty years ago but has only recently been completed. The total cost has been nearly £30,000.

A Statue to Pasteur has been erected in the little village of Arbois. M. Dailhon is the sculptor, who made himself celebrated in connection with the decorations of the chapel in the Rue Jean Goujon, Paris.

A Correction.—In the reply given on p. 168 of our last issue, Messrs. T. A. Richardson were mentioned as the publishers of "The Art of Architectural Modelling in Paper." This is incorrect. Mr. B. T. Batsford, of 94, High Holborn, W.C., is the publisher.

Bornslay-Schnirch, the celebrated sculptor of Bohemia, has just died at the early age of fifty-six years. He executed several fine statues, but his time was chiefly occupied in decorating with statuary the public monuments of Prague. The taste and simplicity of his work gives it an air of classic dignity.

St. Peter's New Church, Oldham, has now been completed. The church stands on the site of the former one, erected in 1765, as a chapel-of-ease to St. Mary's hard by, and enlarged in 1804. It is built of flecked Runcorn stone within and without. The total cost is about £13,000, and the work has been carried out by Messrs. T. Bebbington and Son, of Oldham, from the designs and under the supervision of Messrs. Wild, Collins, and Wild, architects, of Oldham.

A "Russian Bath," recently added by the Leeds Corporation baths at Union Street, has been opened. The accommodation includes hot room, warm lavatories, shampooing room, cooling room, and dressing boxes for fifty persons. The new arrangement occupies the space formerly taken up by the first-class swimming bath. The temperature in the hot room ranges from 105 degs. to 110 degs. Fahr., and is obtained by injecting showers of steam. Mr. W. S. Braithwaite is the architect, details having been arranged by Mr. C. T. Bond.

The Antiquities from Susa sent to France by M. de Morgan (who is charged by the French Government with the work of excavating the ruins of the town where the ancient Persian kings spent their winters and deposited their treasure) have now arrived at the Louvre, and are being arranged and classified. For some three years past the French have been excavating in Persia by arrangement with the Government of Teheran and in consideration of an expenditure of 100,000fr. and a gift of Gobelins tapestry. M. de Morgan has been engaged in digging over the area originally explored by M. and Madame Dieulafoy.

Glasgow Institute of Architects.—The annual general meeting of this Institute was held on October 15th, Mr. John James Burnet, A.R.S.A., F.R.I.B.A., president, in the chair. The thirty-third annual report stated that during the past session Sir James D. Marwick, LL.D., was added to the roll of honorary members, but there had been removed from the same roll, by his death during the year, Mr. John Burnet, F.R.I.B.A., father of the president. Mr. Burnet had reached the venerable age of eighty-seven years, and was held in the highest esteem by all who knew him. During the year three names were added to the roll of ordinary members, of whom there are now seventy-two on the roll. After the president had delivered his inaugural address, the council for the ensuing year was elected.

Lectures on Chemistry of Building Materials.—A special course of ten lectures, illustrated by numerous experiments, on chemistry for builders is being given at the Battersea Polytechnic on Friday evenings at 8.30, commencing last week. The course is specially arranged for building students, and the syllabus will include the action of air on building materials, water on pipes, lime, chalk, mortar, cements, building stones, artificial stones, common metals, oils, paints and varnishes. These lectures will be followed by special lectures on the botany of building timber and practical mechanics for builders. A special course of lectures on general elementary experimental science, including the chief principles of physics and chemistry, will be given on the same evening, commencing at 7.15, and will be found of great service to building students.

The Parish Church at Loftus, Yorkshire, is to be restored.

Mr. Arnold Thornely, architect, late of 14, Castle Street, Liverpool, has removed to May Buildings, 51, North John Street, Liverpool.

As a Memorial to Queen Victoria Mr. S. J. Waring, jun., has erected a steeple at Foots Cray Church, Kent.

Maidwell Hall, Northampton, is to be Re-built. Mr. Henry Green, Northampton, is the builder; Mr. M. H. Holding, A.R.I.B.A., of Northampton the architect.

Mr. Alfred Waterhouse, R.A., who still remains at his Berkshire residence, Yattenden Court, continues to make steady progress, and has been able to receive calls from a few personal friends during the past week or two.

A Russian Guild of Artists.—A group of young artists who have finished their course of studies has founded in St. Petersburg the first guild of artists ever formed in Russia. Their object is to undertake the beautifying of churches and houses or other artistic work on contract.

The Reparation of Crowland Abbey was discontinued two years ago through lack of funds, but the rector is now endeavouring to raise £800 to continue the work. The rector, in issuing his appeal, says his aim his preservation and not restoration.

Change of Address.—Owing to the expiration of the lease of their present premises at Perchard House, 70, Gower Street, W.C., Messrs. Howgate & Keith, architects and surveyors, have removed to new offices at No. 10, Sackville Street, Piccadilly, W.

"Sanitary Architecture."—Owing to the great pressure on our space we are obliged to hold over till next week our report of the lecture on this subject delivered by Mr. Mark H. Judge, A.R.I.B.A., at the Carpenters' Hall on Thursday last.

Evening Classes in Building Construction, architectural drawing, builders' quantities and book-keeping, carpentry and joinery, staircasing and handrailing, brickwork, masonry, plasterers', painters', decorators' and plumbers' work, commence to-night at the Northern Polytechnic Institute, Holloway Road, N. The day school of technology (building trades) is also commencing. Particulars can be obtained from the principal, Mr. Reginald T. Smith, B.A.

The Glasgow Architectural Association held a meeting last week. The president, Mr. Charles E. Whitelaw occupied the chair. Mr. Alexander N. Paterson, M.A., A.R.I.B.A., delivered a lecture on "Scottish Domestic Architecture of the Seventeenth Century," showing lantern slides from the collection of Mr. John Fleming. At the close of the lecture, Mr. William J. Blain moved a vote of thanks to Messrs. Paterson and Fleming, and Mr. James Lochhead seconded. The president then announced the result of the house committee election. Mr. Thomas Ramsay was appointed in place of Mr. Hugh Dale, who retires. The house committee for the session are Messrs. Charles E. Whitelaw, William J. Blain and Thomas Ramsay.

Building Sites and Fever. — The conditions which apparently are responsible for the outbreak of scarlet fever in the Horton Grange district of Bradford are not without parallel elsewhere, says the "Lancet," while they show that the attention of local authorities when directed to new buildings erected in their districts should not be confined to the details of the structures to be erected. Dr. W. A. Evans, the medical officer of health of Bradford, has informed the health committee of the corporation that the outbreak is, in his opinion, due to the "tipping system," resorted to for filling up depressions in ground which is destined to be built upon. "Tipping," or "dumping" as they say in America, ashpit refuse from the neighbouring urban district it is quite clear is about as unsuitable a soil to build dwelling-houses upon as could be invented. Ashpit refuse naturally subsides unevenly under the weight of a house, with the result that drain pipes are broken and displaced. The Bradford Health Committee hope that the cleansing committee will discontinue the practice of tipping refuse in the neighbourhood, and also hope that the building committee will insist upon precautions such as concrete floors where refuse is built upon.

In the Churchyard of All Hallows, London Wall, E.C., it is proposed to built a permanent shelter for men who, in order to take advantage of the early cheap trains, arrive in the City long before the time they are due at their places of business. The building will include a comfortable waiting-room and a library. It will cost about £1,000.

The New Home for Lloyd's Registry of Shipping in Fenchurch Street, E.C., which was commenced three years ago, and will be completed in three months from this date, was visited recently by the members of the British Institute of Carpenters. The exterior is entirely composed of Portland stone. Mr. Fagan has sculptured for the board-room a white marble group representing commerce and shipping. Over £70,000 was paid for the site, and £100,000 is being spent on the building. Mr. T. E. Collcutt is the architect.

The Northern Architectural Association recently visited the new premises of the Newcastle Breweries, Ltd., in the Haymarket, and the electrical power station for the new tramways in City Road. Mr. Joseph Oswald, of the firm of Messrs. Oswald & Son, from whose designs the Breweries Company's premises have been erected by Messrs. Walter Scott & Co., building contractors, of Newcastle, acted as guide to the inspecting party, among whom were Mr. F. Rule, the president of the association, and Mr. Plummer, the hon. secretary. The building is lavishly decorated from the basement to the top floor. The visit to the electrical-power station of the Corporation in City Road was brief. Mr. Simpson pointed out the architectural features of the structure, while Mr. Rossignol rendered a similar service in respect of the machinery.

Edinburgh Architectural Societies Amalgamate.—The annual general meeting of the Edinburgh Architectural Association was held on Wednesday last. The members of the Edinburgh Architectural Society attended, and the two societies were amalgamated under the name of the old body, which has been in existence for forty-three years. The following office-bearers were then elected:—President, Mr. Henry F. Kerr; vice-presidents, Mr. A. Hunter Crawford and Mr. A. Lorne Campbell; secretaries, Mr. W. M. Page and Mr. C. B. Cownie; treasurer, Mr. John Johnstone, C.A.; librarian, Mr. John Watson; convener of publication committee, Mr. G. S. Aitken; and the following members of committee: Mr. James Bruce, W.S., Mr. Thomas Ross, Mr. George Henderson, Mr. Hay Lamont, Mr. A. Greig and Mr. Balfour Paul.

The Albert Memorial was recently stated to be in a deplorable condition, the mosaic falling off, some of the statuettes disfigured through neglect, and the railings and gates in a worse condition than the monument. Lord Esher, of His Majesty's Office of Works denies this. He says: "Since the monument was erected there have at times been small showers of powder from the mosiac. The statuary is all in excellent order. It is a matter of taste, but the gilding of the monument is thought by many to be in better taste now than when originally erected. To regild would give it a tawdry appearance, which might appeal to some people, but is resented by others. The railings are not in good order, and have been the subject of much anxious consideration. Their treatment is under the consideration of outside experts, whose opinion the First Commissioner of Works is awaiting."

A New Church at Waterford is being erected in connection with the Convent of the Good Shepherd there. The chapel will comprise nun's choir or nave, sanctuary and avant choir at the west end of nave, two side aisles (one for the accommodation of the penitents and the other for the children of the Industrial School under the charge of the nuns), and a Magdalen's choir and large sacristies for priests and nuns. The chapel will be connected with the convent and schools by cloisters on each side. The dimensions of the chapel will be—nave, 27ft. 6in. by 24ft. wide; patients' aisle and aisle for industrial school children, each 91ft. 6in. by 22ft. wide; sanctuary, 31ft. by 31ft.; Magdalen's choir, 25ft. by 18ft.; priests' sacristy, 20ft. 9in. by 19ft.; nuns' sacristy, 19ft. by 18ft. Messrs. John Hearne & Son, of Waterford, are the builders, and Mr. William Byrne, M.P.I.A., of 20, Suffolk Street, Dublin, is the architect.

Trade and Craft.

Gas Stoves.

With the improved construction consequent on long experience, gas stoves have outlived the reproach first applied to them that they were unhealthy, because they gave off injurious products and produced an unpleasant dryness in the air which they warmed. Yet, though necessary with the ordinary class of stoves, the ventilating flues sometimes entail considerable trouble and inconvenience in fixing; so that a stove which can do without a flue must possess a great advantage. Such a stove—the "Lux-Calor"—is made by Messrs. Ritchie & Co., of 46, Hatfield Street, Southwark, S.E. A variety of patterns are obtainable, varying from single-tube stoves, for use in bathrooms or small offices, to large ones suitable for clubs, halls, schoolrooms and similar places. It has been found that, taking gas at 3s. per thousand cub. ft. and coal at 25s. a ton, the "Lux-Calor" gives heat equal to a coal fire at 20 per cent. less cost. Stove No. C 1 burns 6ft. of gas per hour, and will heat a room 20ft. sq.; its cost is 70s. The products from the automatic system of condensation in these stoves (which have been supplied to His Majesty the King, the Bank of England, Mansion House, and for other important buildings) amount to an average of forty fluid ounces in ten hours, and consist of water, sulphuric acid, sulphurous acid, carbonic acid, iron, ammonia and some organic matter.

Builders' Hardware and Ironmongery.

Messrs. O'Brien, Thomas & Co., wholesale hardware factors and merchants, of 17 and 18, Upper Thames Street, E.C., send us a copy of the new edition (No. 36) of their general catalogue. Such a catalogue of grates, ranges, and other builders' hardware and ironmongery does not call for much comment in these columns. It is, however, a thoroughly comprehensive one, and should be found most useful; especially as it is produced in the handy form of a small thick book, neatly bound. A two weeks' sale of odd and surplus stock is now being held at the firm's showrooms. It closes on Saturday next, October 26th.

Street Lighting.

We have not yet arrived at that state of perfection in electric lighting which will result in "point" lighting being superseded by "glow" lighting, but in several instances successful attempts toward such a result have been made. Though we have become so accustomed to the use of electric light in our streets, in reality it is only a comparatively short time since it was first adopted; yet the success which has attended its wide introduction is clearly proved by the installations now established in almost all the towns throughout the country. Good fittings are essential to success, and in this connection we would draw attention to those made by the Improved Electric Glow Lamp Co., Ltd., of 7, Great Newport Street, London, W. By the use of silvered conical I.E.G. lamps a mean illumination of sixty candle-power is obtained over an area of 2,000 sq. ft. for an expenditure of 100 watts. As the connections are simple and inexpensive, these lamps can be very conveniently employed where existing gas-lamps are used in place of electric light standards; but it is of course preferable that properly-designed electric standards should be used, such as the "Kingston," illustrated in this firm's catalogue. Where the I.E.G. lamp system may not be considered satisfactory, other types may be used with an arrangement of multiple glass mirrors which diffuse the light pleasingly. Besides glow lamps the company also supplies arc lamps fitted with a patent raising and lowering gear which saves 50 per cent. in the cost of trimming, and as the lamps are enclosed they entail very little expenditure on carbons.

A New Church of St. Michael and All Angels, Northfield, Rotherham, was consecrated recently. The church is in the Early English style, comprising nave and aisles, chancel and baptistery. It has cost about £5,300. Mr. E. Isle Hubbard is the architect. A feature of the exterior of the eastern gable is a representation of the Crucifixion.

Surveying and Sanitary Notes.

Messrs. George Jennings, Ltd., of Lambeth Palace Road, London, S.E., have been appointed sanitary engineers to His Majesty the King.

"Building in its Relation to Health" was the title of a lecture by Mr. Keith Downes Young, delivered to candidates preparing for the examination held by the Carpenters' Company in sanitary building construction at the Carpenters' Hall, London Wall, last Thursday week. Mr. Young summed up the conditions which made for health in a dwelling house as follows:—(1) A site which was clean and dry, and an aspect which was light and cheerful; (2) efficient ventilation; (3) rapid and effectual removal of sewage; (4) ample and pure water supply; (5) construction which should be proof against damp arising from soil, walls, or roof; (6) materials free from organic impurity; and (7) rooms of sufficient size and properly lighted.

The Sanitary Condition of Weymouth.—Dr. R. Deane Sweeting, one of the medical inspectors of the Local Government Board, has furnished to that Department a report on the general sanitary circumstances and administration of the borough of Weymouth and Melcombe Regis. As the result of his inspection of the borough, Dr. Deane Sweeting emphasises the need for greater attention to the condition of the many insanitary courts and the more vigorous dealing with them under the Housing of the Working Classes Act of 1890, a more rigid enforcement of the building by-laws, consideration by the town council and their officers of the questions of flushing and ventilation of the sewers, more extended provision of water to closets, undertaking of scavenging by the corporation and the provision of a destructor, submission of a new series of by-laws for (1) nuisances, (2) slaughter houses, (3) common lodging-houses, and (4) offensive trades for confirmation by the Board, and a better enforcement of the existing regulations under the Dairies, Cowsheds, and Milkshops Order of 1885.

A New Seawall and Apron at Penmaenmawr, for the support of the new promenade, is to be completed by July next year. The work is being carried out under the supervision of Mr. E. Worrall, the surveyer to the Urban District Council without the intervention of a contractor. The face of the sea wall is to be composed of Anglesey limestone, which is to be obtained from the Traethbychan quarry, each stone to be delivered ready dressed. The seawall will be 400yds. long, 12ft. high, and 6ft. wide at the base. The base of the apron will be bedded against piles, which will be driven by steam pile-driving machinery. Steam cranes, steam concrete mixing machinery, and steam stone-crushing machinery are being used. By arrangement with the London and North-Western Railway Company a temporary line will be laid from the promenade into the goods yard adjoining, so that the crane used on the works will be able to enter the yard and unload the stone from the railway waggons, thus greatly facilitating the work. The stone excavated from the shingly beach will be broken in the crusher and converted into concrete by the mixing machine, to form the inner portions of the wall. The promenade works will be the subject of further operations in the following slack season.

Registration of Plumbers.—The committee of representatives of District Councils for Belfast, Birmingham, Bradford, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Nottingham, Plymouth and Sheffield, acting in conjunction with the Plumbers' Company, deem it highly desirable that a prescribed apprenticeship or course of training should be recognised in connection with the national registration of plumbers. A special form of indenture has been prepared for the purpose by a conjoint board, composed of representatives of the London Society of Associated Master Plumbers, the United Operative Plumbers' Association of Great Britain and Ireland, and the Plumbers' Company. The indenture, which is approved by the Court of Chancery, includes definitions of the character and scope of the work of the registered plumber and of the term "sanitary plumbing" as approved by the Parliamentary Committee on Trade, in order that the sanitary bearing of the work of the registered plumber may be generally recognised by plumbers, as well as by architects, health authorities, and others, as constituting the reason for the registration system and the ground of the application for statutory powers to be conferred on the registered body. Communications have been addressed to all the local authorities acting in conjunction with the Plumbers' Company, urging their co-operation, and recommending that a register of apprentices should be kept in each district.

A Hull Improvement Scheme.—Mr. Walter Long, the President of the Local Government Board, visited Hull last week for the purpose of opening two new streets which have been formed in the heart of the city. The new streets converge at the city end of Prospect Street, which is a continuation of Beverley Road. King Edward Street is on the direct line to the old town within the docks; while Jameson Street leads on through George Street to the North Bridge and Holderness Road. They are about 75ft. wide, will be illuminated with the electric light and the buildings to be erected upon them are restricted to a minimum height of 36ft. A great deal of the property demolished within the Saville Street area was slum property, and three rather unsavoury thoroughfares have entirely disappeared. In order to acquire the necessary land the Corporation have had to spend £220,000; but, already £120,000 has been received from the sales of sites. Other portions of the city improvement scheme are making rapid progress. The blocks of property bounded by Waterworks Street and St. John's Street, have been acquired for the City square, which is to contain the Queen Victoria Memorial; and £35,000 has already been spent in obtaining the land for a new street from the Monument Bridge to Lowgate. A statue of William de la Pole was unveiled at the junction of King Edward and Jameson Streets.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BERKHAMPSTEAD.—For execution of certain works of addition and of alterations in the infirmary and workhouse of the union at Berkhampstead, for the Guardians. Mr. C. H. Rew, architect, Berkhampstead. Quantities by Mr. Josh. Rookwood, 25 Bedford Row, W.C.:—

G. Jackson, Sutton	£1,468	0
Dupont & Co., Watford	1,412	0
J. & J. Goss, Watford	1,405	0
G. & T. Cannon, Aylesbury	1,347	0
Waldo & Cox, Henley-on-Thames	1,323	0
H. Martin, Northampton	1,318	0
G. Wiggs, Watford	1,306	0
T. H. Coleman, Bedford	1,234	0
E. Wright, Tring	1,212	0
C. Brightman, Watford	1,199	0
J. Honour & Son, Tring	1,152	0
H. & J. Matthews,* Castle Street, Berkhampstead	1,110	10

* Accepted. [Architect's estimate, £1,200.]

BIDEFORD.—For the construction of about 400 yards of 15-inch and 9-inch stoneware and about 200 yards of 12-inch and 9-inch cast-iron pipe sewers, the laying of a cast-iron water main, the restoration of existing sewers, and the construction of manholes, ventilators, flushing stations, automatic pumping station, hydraulic pumping machinery, and storm overflows in connection with the sewerage and disposal of the sewage of East-the-Water at Bideford, for the Corporation:—

E. R. Lester, 13 Whitefield Terrace, Plymouth	£3,935	0	0
J. & T. Benns, 104 Wellesley Road, Croydon	2,745	16	5
R. H. B. Neal, Princess Square, Plymouth	2,624	0	0
S. Wood, 10 Richmond Avenue, Montpelier, Bristol	2,616	17	4
Dart & Pollard, Midvale Works, Paignton	2,607	13	7
M. Bridgman, Paignton	2,583	18	10
E. Ellis & Son,* Bideford	2,318	13	6

* Accepted.

BRIDLINGTON.—For the erection and completion of Central Schools and caretaker's residence at Oxford Street, Bridlington, for the Bridlington United District School Board. Mr. J. Earnshaw, M.S.A., architect, Bridlington:—

J. Rennard	£16,533	19	0
Palframan, Whitby	15,451	6	9
J. B. Allatt, Heckmondwike	15,018	11	0
Taylor, Limited, Guisley	14,536	16	0
E. Corner, Bridlington	14,397	0	0
A. Lyon, Malton	14,293	0	0
Blackburn & Son, Hull	14,035	0	0
Smallwood & Shaw	13,978	2	0
A. Gardam	13,780	2	0
J. H. Hudson	13,496	5	8
J. Sawdon	13,495	0	0
T. Spink	12,930	1	5
Sampson & Siddall*	12,590	11	11

* Accepted subject to the sanction of the Board of Education. [Rest of Bridlington.]

CARDIFF.—For the erection of chancel, vestries, organ chamber, and porch to St. Teilo's Church, Cardiff. Mr. George E. Halliday, F.R.I.B.A., architect, Cardiff. Quantities by Mr. John W. Rodger, Cardiff:—

W. T. Morgan	£2,334	0	0
C. C. Dunn	2,324	5	2
Knox & Wells	2,250	0	0
S. Shepton & Son	2,239	19	2
Lattey & Co.	2,116	0	0
A. W. Cadwallader*	2,030	0	0
C. Beams & Nephew	1,980	0	0
T. Bevan, Penarth	1,893	10	0

* Accepted. [Rest of Cardiff.]

CLELAND AND OMOA (SCOTLAND).—For providing and laying about 1¼ miles of sewers and relative works, and for constructing sewage purification works for the villages of Cleland and Omoa, for the District Committee of the Middle Ward of the county of Lanark:—

Forest & McLeod, 12 Dixon Street, Glasgow	£3,268	4	11
Henderson & Duncan, Harmony Villa, Morningside, Edinburgh	2,813	7	2
D. & J. Stratton, 34 Sandwick Place, Edinburgh	2,711	3	7
R. C. Brebner & Co., 4A St. Andrew, Edinburgh	2,710	3	9
Blair & White, 95 Bath Street, Glasgow	2,659	14	4
T. Crawford & Son, Hamilton Waterworks, Strathaven	2,636	2	5
A. Duncan, 10 Waverley Gardens, Crossmyloof, Glasgow	2,627	6	7
W. G. Flitt, Lenzie	2,599	17	7
A. Frew & Co., Rawyards, Airdrie	2,560	11	4
R. Riddugh, Queen Victoria Street, Airdrie	2,557	12	5
A. Cameron, Bonnington Grove, Edinburgh	2,500	3	3
W. Clarkson, Lismahago	2,499	6	4
Craik & Tuckwell, 134 St. Vincent Street, Glasgow	2,396	13	5
J. Johnstone, Bellshill	2,356	9	8
D. Scott,* Bryson Road, Edinburgh	2,149	12	10

* Accepted.

COMBE MARTIN (N. DEVON).—For the erection of a dwelling house, for Mr. W. H. Lerwill. Mr. Allen T. Hussell, M.S.A. architect, Ilfracombe:—

J. Burgess	£355	0
R. Lovering	348	0
W. Cutcliffe	329	10
W. C. Latham	272	0
M. Darch*	240	0

* Accepted.

ENFIELD.—For making up the following private streets in their district, for the Enfield Urban District Council, viz., Seventh Avenue, Bush Hill Park: Fotheringham Road, Enfield. Mr. Collins, surveyor:—

Fotheringham Road.	
Griffiths & Co., Ltd., Bishopsgate Without	£2,920
C. Bloomfield, Tottenham	2,876
E. J. Betts, Enfield Highway	2,600
Adams,* Wood Green	2,549
Seventh Avenue.	
Griffiths & Co., Ltd.	761
C. Bloomfield	728
E. J. Betts	717
Adams*	699

* Accepted.

LONDON, E.—For the supply of condensing plant, boiler feed pump, and steam and water piping, &c., for the Electricity Committee of the Poplar Borough Council:—

Maxim Electrical and Engineering Company	£4,465	0
Fraser & Son, Millwall	3,905	0
Alley & Maclellan	3,581	0
D. Stewart & Co.	3,566	0
Babcock & Willcox*	3,485	3

* Accepted.

LONDON, E.—For the supply of multiple-core, covered lead feeder and network cable and accessories for mains extensions, for the Electricity Committee of the Poplar Borough Council:—

Anchor Cable Company	£14,265	19	2
St. Helen's Cable Co.	12,919	2	1
Glover & Co.	12,068	4	5
Henley & Co.	11,872	19	2
Western Electric Co.	11,017	3	4
British Insulated Wire Co.*	10,522	10	4

* Accepted.

LONDON, E.—For supply of high-tension continuous-current transforming plant and switch gear, &c., for the Electricity Committee of the Poplar Borough Council:—

Johnson & Phillips	£5,720
Brush Electric Co.	5,596
Mather & Platt	4,624
Electric Construction Co.*	4,073
Johnson & Phillips	3,750

* Accepted.

NEATH.—For erection of a vicarage house, near Neath Mr Geo. E. Halliday, F.R.I B.A., architect, 14 High Street, Cardiff. Quantities by Mr. J. W. Rodger, Cardiff:—

W. A. James, Cowbridge	£1,697	17	4
W. H. Creighton, Neath	1,640	0	0
D. Thomas & Son, Cardiff	1,555	0	0
J. Goodridge & Son,* Swansea	1,460	0	0
C. Gower, Neath	1,444	10	0

* Accepted.

STOCKTON-ON-TEES.—For the erection of business premises, 41 High Street. Mr. Eugene E. Chephan, architect, St. Nicholas Chambers, Newcastle-on-Tyne:—

T. Hanley	£1,938
R. Johnson & Son	1,914
R. Blackett & Son	1,900
A. Cooke	1,887
Craggs & Benson	1,824
John Davison	1,810
T. Brown,* 12 The Square, Stockton-on-Tees	1,698

* Accepted.

SELLY OAK (near BIRMINGHAM).—For the erection at the workhouse, Selly Oak, of receiving wards, porter's lodge and new pavilion, stores and offices, workshed, &c, for the Guardians of King's Norton Union. Messrs. Whitwell & Son, architects, Birmingham:—

J. Harley & Son, Smethwick	£21,350
W. Bishop, King's Heath	21,254
Barnsley & Sons	20,988
W. J. Stone	20,552
W. Robinson	20,370
Smith & Pitts	20,320
B. Whitehouse & Sons	20,269
R. M. Hughes	19,071
W. H. Gibbs,* King's Heath	18,700

* Accepted. [Rest of Birmingham.]

SOUTHEND-ON-SEA.—For the erection of new bank, West Cliff, Southend, for the Capital and Counties Banking Co., Ltd., Threadneedle Street, London, E.C. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend:—

Sheffield Bros., London	£3,997
Howard Bros.	3,712
F. & E. Davey	3,347
Davis & Leaney*	3,267
W. Stubbs	3,096

* Accepted. [Rest of Southend.]

WEALDSTONE (MIDDLESEX).—For certain works of street improvement and surface-water drainage in the High Street (two separate contracts), for the Wealdstone Urban District Council. Mr. F. Hill Parr, C.E., surveyor:—

Surface-water sewer.			
W. Neave & Son	£380	17	3
Adams & Co.	379	0	7
R. Ballard & Co.	368	0	0
G. R. Mann	347	13	5
E. W. Hollingsworth*	338	7	9
G. Wilson	318	0	0
Free & Sons	308	18	0
Felkin & Watson	278	0	0
H. Brown	263	13	9
Road.			
H. Brown	£1,266	2	5
Adams & Co.	1,237	3	10
Felkin & Watson	1,234	0	0
R. Ballard & Co.	1,185	0	0
G. Wilson	1,179	0	0
Free & Sons	1,149	8	5
W. Neave & Son	1,129	18	0
G. R. Mann	1,125	0	0
E. W. Hollingsworth*	1,108	8	10

* Accepted.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Oct. 25	Ancoats, Manchester—Stonebreaking, &c.	Joint Workhouse Committee	A. J. Murgatroyd, 23, Strutt Street, Manchester.
" 25	Aberavon—Alterations	——	G. P. Davies, Architect, Station Road, Port Talbot.
" 25	Derby—Enlargement	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.
" 25	Hebburn and Southwick-on-Wear—Police Court, &c.	Standing Joint Committee of the C.C.	County Surveyor's Office, Shire Hall, Durham.
" 25	Manchester—Sheds, &c.	Workhouse Committee	A. J. Murgatroyd, 23 Strutt Street, Manchester.
" 25	Nairn, Scotland—Additions	——	C. C. Doig, Architect, Elgin.
" 25	Salford—Roofing	Guardians of Union	Steward at the Infirmary, Salford.
" 25	York—Enlargement	Commissioners of H.M. Works	Postmaster, York.
" 25	Wolverhampton—Alterations, &c., to School	School Board	J. F. Robinson, Clerk to the Board, Wolverhampton.
" 25	Newhills, N.B.—Alterations to School	School Board	Jenkins & Marr, 16 Bridge Street, Aberdeen.
" 26	Youghal—Alterations, &c, to Schools	St. Mary's Parish Vestry	R. Walker & Son, 17 South Mall, Cork.
" 26	Monmouth—Repairs to Hotel	——	P. E. Wanklyn, Borough Surveyor, Monmouth.
" 26	Barnstable—Rebuilding House and Shop	Mr. Frayne	W. C. Oliver, Architect, Barnstaple.
" 26	Roscommon—Alterations, &c., at Infirmary	County Infirmary Governors	J. J. Sheil, Registrar, The Boardroom, Roscommon.
" 26	Hebburn—Police Court	Durham County Council	W. Crozier, County Architect, Shire Hall, Durham.
" 26	Southwick-on-Wear—Police Court	Durham County Council	W. Crozier, County Architect, Shire Hall, Durham.
" 26	Thorpe-le-Soken, Essex—Alterations, &c., to Schools	——	C. E. Butcher, 2 Queen Street, Colchester.
" 26	Whitley, Northumberland—Branch Premises	North Shields Industrial Society, Ltd.	Hope & Maxwell, Architects, Saville Street, North Shields.
" 26	Glasgow—Roof, &c	Corporation	J. Young, 88 Renfield Street, Glasgow.
" 26	Aberystwyth—Villa Residence	J. Thomas	T. E. Morgan, Architect, Aberystwyth.
" 28	London, N.E.—Three Workshops, &c.	Governors of Hackney Institute	A. W. S. Cross, 58 Conduit Street, Regent Street, W.
" 28	Gt. Northern Railway Co., Ireland—Houses, &c.	Directors	Company's Engineer, Amiens Street Terminus, Dublin.
" 28	Belfast—Renewal of Roof over Station	Great Northern Railway Co. (Ireland)	Company's Engineer-in Chief, Amiens Street Terminus, Dublin.
" 28	Brynteg, near Wrexham—Schools, &c.	Broughton School Board	R. J. Kendrick, 1 Henblas Street, Wrexham.
" 28	Willenhall—Disinfecting Station	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
" 28	Batley—Council Offices, &c.	Horbury Urban District Council	W. Hanstock & Sons, Architects, Batley.
" 28	Rochford, Essex—Wards at Infirmary	Union Guardians	Greenhalgh & Brockbank, Bank Chambers, Southend-on-Sea.
" 28	Northfleet, Kent—Car Shed, Workshops, &c.	British Electric Traction Co., Ltd.	Chief Engineer, Donington House, Norfolk Street, E.C.
" 28	Cowbridge, Wales—Farmhouse	——	D. Evans, Eastbourne House, Cowbridge.
" 28	Port Erin—Building and Excavation of Tank	Isle of Man Fish Hatchery Committee	R. Okell, hon. sec., Sutton, Douglas.
" 28	Manchester—Building	Corporation Waterworks Committee	Secretary, Waterworks Offices, Town Hall, Manchester.
" 28	Darlington—Laboratory	Markets Committee	Borough Surveyor, Town Hall, Darlington.
" 28	Eastbourne—Conveniences, &c.	Pleasure Grounds Committee	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
" 28	Glasgow—Hospital	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
" 28	Fulwood—Additions, &c., to Laundry Buildings	Guardians of Workhouse	J. W. Whitwell, Engineer at the Fulwood Workhouse.
" 28	Devonport—Disinfector and Diseases Hospital Wing	County Council	J. F. Burns, 30 Ker Street, Devonport.
" 28	Porth—Vestry to Baptist Church	——	E. George, 15 Tanyrallt Terrace, Porth.
" 28	Bradford—Three Shops	——	S. Jackson & Son, Architects, Tanfield Chamber, Bradford.
" 29	Great Yarmouth—Car Shed and Boundary Wall	Tramways Committee	J. W. Cockrill, Borough Surveyor, Town Hall, Great Yarmouth.
" 29	Isleworth—Additions to Nurses' Home	Brentford Union Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
" 29	Pontypool—Chimney Stacks at Workhouse	Union Guardians	Clerk of Works, Workhouse, Pontypool.
" 29	London, S.W.—Sub-District Post Office	Commissioners of H.M. Works	H. Tanner, H.M. Office of Works, Storey's Gate, London, S.W.
" 30	Cheltenham—Town Hall	Corporation	E. T. Brydges, Town Clerk, Municipal Offices, Cheltenham.
" 30	Tottington, Lancs—Caretaker's Building	Urban District Council	L. Kenyon, 33 Chapel Street, Tottington.
" 30	Blackpool—Church	——	H. Goldsmith, 63, Faulkner Street, Manchester.
" 30	Manchester—Padded Room at Workhouse	Guardians	A. J. Murgatroyd, 23 Strutt Street, Manchester.
" 31	Brockley, S.E.—Sorting Office	Commissioners of H.M. Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
" 31	Wandsworth, S.W.—Intermediate School	Guardians	Lansdell & Harrison, 65 & 66 Basinghall Street, E.C.
" 31	Low Bridge, near Kilfinane—Creamery	Co-operative Dairy Society, Ltd.	J. C. Bennett, Hon. Sec., Kilfinane, co. Limerick.
" 31	Keighley—Public Free Library	Corporation	A. MacKewan and A. J. Swan, 3, Newhall Street, Birmingham.
" 31	Bootle, Lancs—Enlargement of School	School Board	J. Cox, 11 Dale Street, Liverpool.
Nov. 1	Navan, co. Meath—Alterations, &c., to Convent	——	Loretto Convent, Navan, co. Meath.
" 1	Cardigan—Laboratory and Fittings	——	J. Stephens, 3 Green Street, Cardigan.
" 1	Bangor—Villa	——	J. V. Brennan, Architect, Belfast Bank Chambers, Belfast.
" 2	Stainforth, near Doncaster—Classroom	School Board	H. B. Thorpe, Architect, Goole.
" 2	Swindon—Chimney Shaft	Hospital Board	Halliday & Rodger, 14 High Street, Cardiff.
" 2	Larne, Ireland—Chapels, &c., at Cemetery	Urban District Council	W. G. Young, Town Hall, Larne.
" 4	Lancaster—Hospital	Asylums Board	Wilink & Thickness, 14 Castle Street, Liverpool.
" 4	Brighouse—Residence	——	Sharp & Waller, 32 Bradford Road, Brighouse.
" 6	Brentford—Isolation Hospital	Chiswick Urban District Council	A. Ramsden, Surveyor, Town Hall, Chiswick.
" 6	Mallow—Labourers' Cottages	Rural District Council	M. Regan, Clerk, Mallow.
" 12	London, S.W.—Public Offices	H.M. Commissioners of Works	H.M. Office of Works, Storey's Gate, S.W.
" 22	Ystalyfera and Pontardawe, Wales—Schools	Llanguicke School Board	W. W. Williams, 63 Wind Street, Swansea.
	ENGINEERING:		
Oct. 25	Dudley—Pipework	Electric Light and Tramways Committee	R. P. Wilson, 60 Victoria Street Westminster, S.W.
" 25	London, E.C.—Coaching Stock and Goods Wagons	Delhi, Umballa, Kalka Railway Co., Ltd.	W. McFarlane, 17 Victoria Street, Westminster, S.W.
" 26	Leytonstone, Essex—Dynamo	Electric Lighting Committee	F. H. Lewis, Electric Light Works, Cathall Road, Leytonstone.
" 26	Blackpool—Plant for Promenade Widening	Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
" 26	Langport, Somerset—Borehole, &c.	Rural District Council	Bailey-Denton, Son, Lawford & Symons, Palace Chambers, Westminster.
" 26	Blackburn—Engines, &c.	Water Committee	W. Stubbs, Municipal Offices, Blackburn.
" 28	Limerick—Electrical Plant	——	J. Enright, 47, Victoria Street, S.W.
" 29	London, S.W.—Pillar Water Cranes and Wheels	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.
" 29	Ashton-under-Lyne—Overhead Equipment of Trmwys.	Corporation	N. Applebee, Electricity Works, Ashton-under-Lyne.
" 29	Ilford—Electrical Plant	Urban District Council	W. C. C. Hawtayne, 9 Queen Street Place, E.C.
" 29	London, N.E.—Disinfector	Guardians of St. Matthew, Bethnal Green	D. Thomas, Clerk, Bishop's Road, Bethnal Green, N.E.
" 29	Otley, Yorks—Reservoir, &c.	Urban District Council	J. Waugh, Engineer, Sunbridge Chambers, Bradford.
" 30	King's Lynn—Beacon	Conservancy Board	Harbour Master, King's Lynn.
Nov. 1	Blaydon-on-Tyne—Widening Shaft	Stella Coal Company	Hedgefield Offices, Blaydon.
" 1	Edinburgh—Waterworks	Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
" 2	Levenshulme—Refuse-destructor Installation	Urban District Council	J. Jepson, Surveyor, Levenshulme.
" 6	Manchester—Electrical Plant	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
	IRON AND STEEL:		
Oct. 25	Wellingborough—Ironwork	Urban District Council	J. T. Parker, 29 Church Street, Wellingborough.
" 28	Llandudno—Cast-iron Pipes	Urban District Council	E. G. Stephenson, Engineer, Council Offices, Llandudno.
" 28	London, E.C.—Steel Rails, &c.	Burma Railway Company, Ltd.	Secretary, 76 Gresham House, Old Broad Street, E.C.
" 28	London, S.W.—Cast-iron, Ironmongery, &c.	London County Council	County Hall, Spring Gardens, S.W.
" 28	Belfast—Ironmongery, Gasfitting, &c.	Commissioners of Public Works	H. Williams, Secretary, Office of Public Works, Dublin.
" 29	Isleworth—Iron Escape Staircase	Brentford Union Guardians	W. H. Ward, Architect, Birmingham.
Nov. 1	Edinburgh—Cast-iron Pipes	Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
	PAINTING AND PLUMBING:		
Oct. 28	London, S.W.—Plumbers' Fittings, Oils, &c.	London County Council	County Hall, Spring Gardens, S.W.
Nov. 6	Christiania—Oils, White Lead, &c.	Norwegian State Railways Administration	Manager, Engineering Department, Christiania.
	ROADS AND CARTAGE:		
Oct. 25	Stanley, Durham—Street Works	Urban District Council	J. Routledge, Surveyor, Stanley.
" 26	Shoreham—Hire of Steam Roller	Urban District Council	F. Slaughter, West Street, Shoreham.
" 26	Blackpool—Trap or Granite Stone	——	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 29	Dover—Street Improvements	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
" 29	Llandaff—Street Improvements	Rural District Council	J. Holden, 35 St. Mary Street, Cardiff.
" 30	Litherland, Lancs—Passage	Urban District Council	W. B. Garton, 25 Sefton Road, Litherland.
Nov. 1	Enfield, Middlesex—Footpaths	County Council	H. T. Wakelam, County Surveyor, Guildhall, Westminster.
" 2	Chingford, Essex—Making-up, &c.	Urban District Council	W. Stair, 14 The Parade, Chingford.
" 9	Ince, Lancs—Street Works	Urban District Council	Winstanley & Ashworth, 42 Deansgate, Manchester.
" 9	Middleton, Lancs—Paving, &c.	Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton.
" 9	Pinner—Footpath	Parish Council	Down's Farm, Pinner.
" 30	Johannesburg—Pavements	——	"The Times," London, E.C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY:		
Oct. 25	West Hartlepool—Sewerage Scheme	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
,, 28	Newhaven, Sussex—Sewer, &c.	Urban District Council	F. J. Rayner, Town Surveyor, Newhaven, Sussex.
,, 28	Gosport—Sewers, &c.	Urban District Council	R. St. George Moore, 17 Victoria Street, Westminster, S.W.
,, 28	Rugeley, Staffs—Scavenging	Urban District Council	W. E. Rogers, Surveyor to Council, Rugeley.
,, 28	Selby, Yorks—Pipe Sewer	Urban District Council	B. McG. Gray, Town Surveyor, Town Hall, Selby.
,, 29	Mountain Ash, Wales—Sewer, &c.	Urban District Council	Surveyor, Town Hall, Mountain Ash.
Nov. 1	St. Aidan's-by-the-Sea—Outfall Sewer and Sea Wall	Lord Crewe's Trustees	F. H. Anson, 15 Dean's Yard, Westminster.
	TIMBER:		
Oct. 28	Selby, Yorks—Pipe Sewer	Rural District Council	B. McG. Gray, Town Surveyor, Town Hall, Selby.
,, 28	Yarrow—Twenty-four Work Benches	School Board	A. Adam, School Board Manual Instruction Centre, Jarrow.
Nov. 18	Lisbon—Mineral Oil for Timber injections	Royal Portuguese Railway Co.	Company's Officer, 28 Rue de Chateaudun, Paris.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 26	Tadcaster—Sewage Works Scheme	£20.	Bromet & Son, 16 Park Row, Leeds.
,, 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
,, 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
,, 31	Addingham—Club	£20.	W. Thomas, Conservative and Unionist Club, Addingham.
Nov. 4	Stockport—Municipal Buildings	—	R. Hyde, Town Clerk's Office, Stockport.
,, 23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
,, 23	Bexhill—Isolation Hospital	£25.	E. S. Douglas, Town Hall, Bexhill.
Dec. 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
Jan. 1	Liverpool - Cathedral (Portfolios of Drawings or Designs in Gothic Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
,, 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
1902. Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No Date.	Northampton—Master's House and Boys' Boarding House, &c.	25 guineas.	J. Haviland, 2 St. Giles Square, Northampton.

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		£	s.	d.	£	s.	d.
FORAGE.							
Beans	per qr.	1	11	0		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	15	0
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	1	18	0
OILS AND PAINTS.							
Castor Oil, French	per cwt.	1	11	0	1	9	2
Colza Oil, English	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels	do	1	12	3		—	
Petroleum, American	per gal.	0	0	7⅛	0	0	7¼
Do. Russian	do.	0	0	6⅝	0	0	6¾
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	4	16	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	8	6		—	
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	7	1½	1	7	3
METALS.							
Copper, sheet, strong	per ton	80	0	0		—	
Iron, Staffs., bar	do.	6	15	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	15	0	12	0	0
Lead, pig, Soft Foreign	do.	11	8	9	11	10	0
Do. do. English common brands	do.	11	17	6		—	
Do. sheet, English 3lb per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
METALS—*cont.*							
Nails, cut clasp, 3in. to 6in.	do.	6	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	15	0
Do. Mild bars	do.	6	15	0	7	5	0
Tin, Foreign	do.	112	0	0	112	10	0
Do. English ingots	do.	115	15	0	116	10	0
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	2	6	17	7	6
TIMBER.							
SOFT WOODS.							
Fur, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec, Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	9	10	0	10	15	0
Do. do. 4th & 3rd	do.	8	10	0	10	0	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	13	15	0	14	10	0

COMING EVENTS.

Wednesday, October 23.

ASSOCIATION OF MUNICIPAL CORPORATIONS.—Autumn General Meeting, Westminster Palace Hotel, 11 a.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Inspection and Demonstration at L. C. C. Common Lodging House, Parker Street, Drury Lane, W.C., at 3 p.m.

Thursday, October 24.

RUSKIN SOCIETY OF BIRMINGHAM.—Presidential Address by the Right Rev. W. Boyd Carpenter, D.D.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. Henry Robinson, M.I.C.E., on "Sewerage," 7 p.m.

SOCIETY OF ARCHITECTS.—Annual General Meeting at 8 p.m.

BRITISH SCHOOL AT ATHENS.—Sir Richard Jebb presides at the Annual Meeting of Subscribers at Burlington House, Piccadilly, W., 5 p.m.

Friday, October 25.

ARCHITECTURAL ASSOCIATION.—Conversazione at the Royal Institute of Painters in Water Colours, Piccadilly, at 8 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Councillor J. Shaw Maxwell on "The Housing Problem."

Saturday, October 26.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to St. Thomas's Hospital. Assemble in the Central Hall at 3 p.m.

Monday, October 28.

HAMMERSMITH TOWN HALL.—Sir William Richmond on "Church Decoration," 8 p.m.

Tuesday, October 29.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. Henry Robinson, M.I.C.E., on "Sewage Disposal," 7 p.m.

Wednesday, October 30.

AUCTIONEER'S INSTITUTE.—Inaugural Address by the President, Mr. W. B. Rogers, in the Examination Hall, Victoria Embankment, 7.45 p.m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Mr. Percy F. Nursey, C.E., on "The Evolution of High Explosives," 7.30 p.m.

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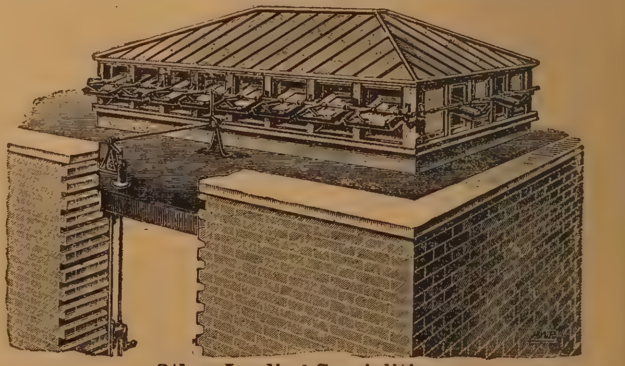

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Penson & Southern, Ltd.

Registered to acquire the business of lime manufacturers and merchants, quarry owners, stone merchants, &c., as now carried on at the Cilyrychen Lime Works and Quarries and Pistill Lime Works and Silica Quarries, all situate at Llandebie, county of Carmarthen, by Penson & Southern, together with a residential landed estate called Pantyrodyn House, and certain cottages and pasture land adjoining thereto, at Llandebie. Capital £30,000 in 1,000 £10 preference shares and 20,000 £1 ordinary shares. The first directors are Captain F. W. Lethbridge, E. Williams, F. G. Southern (managing director) and T. D. Jones. Registered office: Pantyrodyn, Llandebie, Carmarthenshire.

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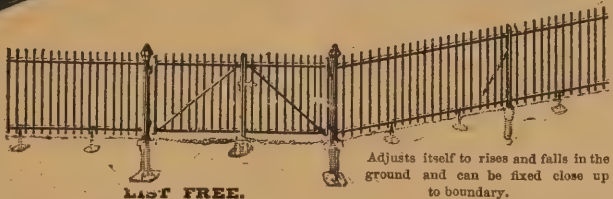

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The OCTOBER Issue contains:
THE ARCHITECT OF NEWGATE. By REGINALD BLOMFIELD. Illustrated by Prints from Piranesi's "Carceri," and many special Photographs by E. Dockree.
THE NEW CATHEDRAL FOR LIVERPOOL. By Professor F. M. SIMPSON and EDWARD S. PRIOR.
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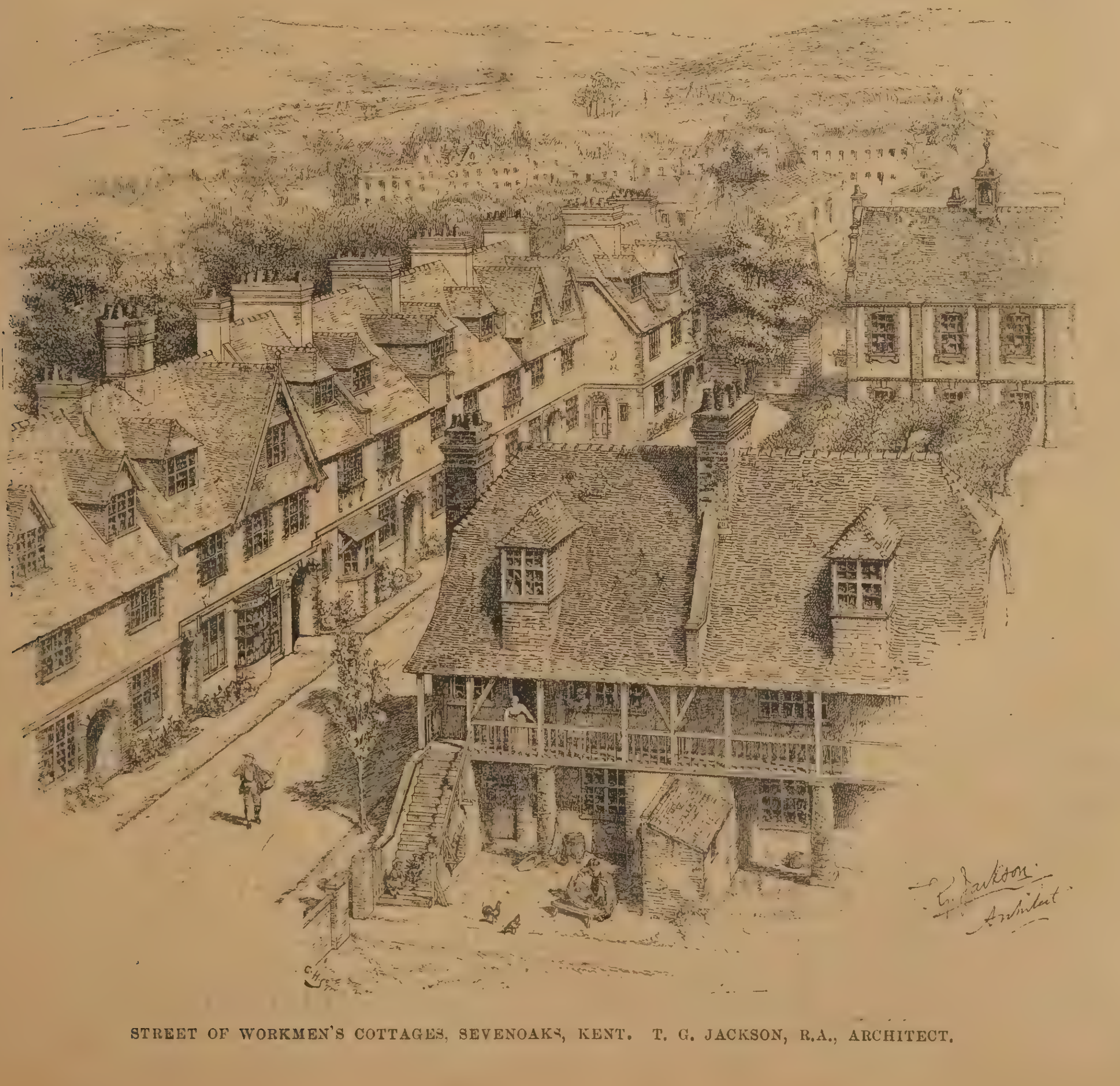
A Street of Cottages.

THE street of workmen's cottages at Sevenoaks, illustrated on this page, is not only a good example of what can be done even under the strictest economy, but the drawing itself (by Mr. Jackson) is an excellent specimen of pen-work: the details are elaborated with care and thought, and there is distinct feeling of ‘ atmosphere,” which throws the houses into their respective reliefs. This is largely due to the house in the foreground being more completely finished than any of the others, its verandah in shade and its roof standing out in contrast to the sunlit street: but in the drawing of the shadows Mr. Jackson has been less fortunate than with the remainder, for they are hardly sharp enough, and (like the shadows of the dormers on the large house, for example) have somewhat the quality of "wooliness." The drawing however is well worth studying. It is always interesting to ascertain the standpoint form which a designer, and more especially an architect, starts. In the case of Mr. Jackson this is clearly shown in his first book, "Modern Gothic Architecture" (published in 1873 when he was in his thirty-ninth year), a book which, on the whole, represents his maturer convictions. Though it may be said that Mr. Jackson's best and most individual designs are not based on Gothic at all, but on Jacobean, it is well first to understand his view of this much-vexed question. He regards as Gothic all buildings which confirm to the conditions of English climate, material and habit. He once wrote: "The English Renaissance, as it appears in such buildings as Audley End and Kirby (a building by which I was strongly influenced when designing the schools at Oxford), Knowle, and others of that style and date, is, from my point of view, a Gothic style; and when the Gothic element drops out of it, as in pure Palladian, it becomes, to my taste, uninteresting." Not everyone will accept such a definition, but it is helpful when forming an estimate of Mr. Jackson's work.

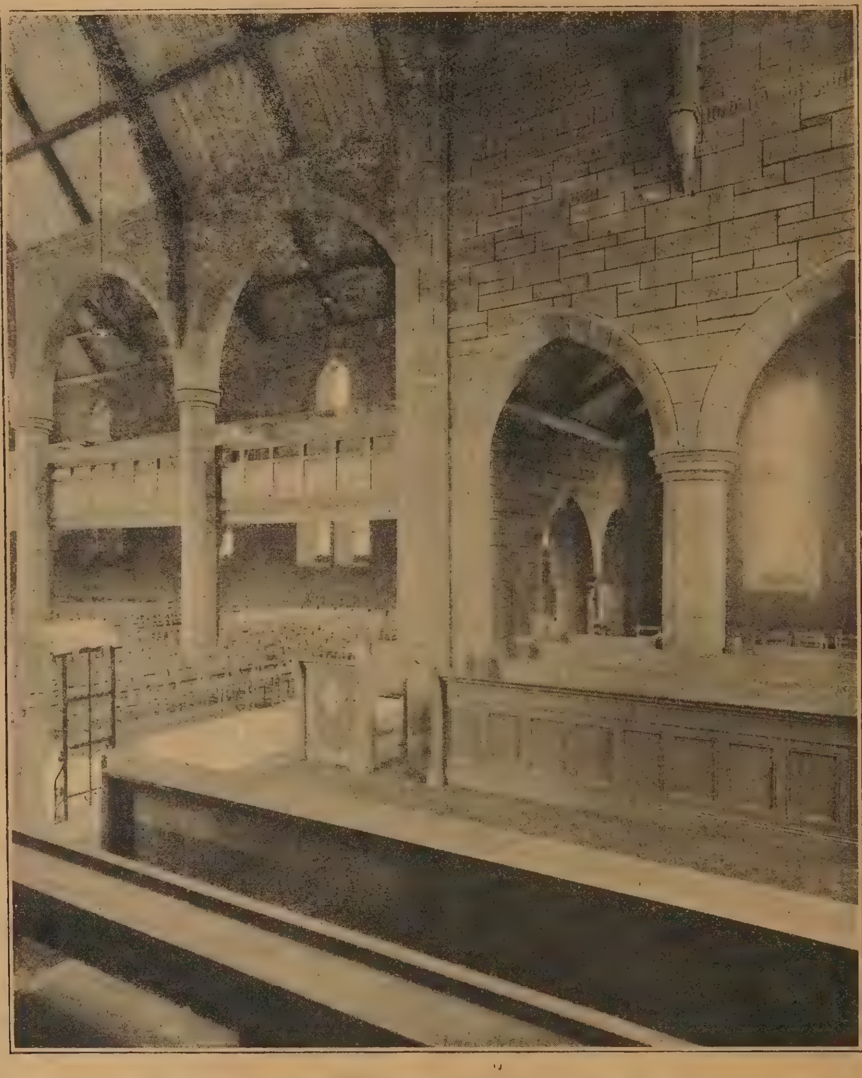
The British Workman.

ARCHITECTS are constantly deploring that the modern workman is such uncompromising material for the production of anything worth looking at, and we fear the truth cannot be gainsaid. Apart from the wild-cat ideas of the reckless socialist, apart from the impracticable dreams of the æsthetic idealist, and disregarding the comforting doctrine of the ignorant optimist—what hope is there under modern conditions of developing in our workmen that skill and intelligence which is essential to all works of excellence? It is certain that we shall never reach such a state whilst workmen are merely "time-machines" (but not Mr. Wells's), when they throw down their tools at the first stroke of the clock in the manner which drew forth the righteous anger of Adam Bede. Everyone pleads helplessness, because the moment they attempt any reform the pocket is touched, and there's an end to most things. So fierce is the competition, the master contends, it is only by getting a maximum of work for a minimum of wage that he is able to make a profit; and the workman excuses himself on the ground that it is not possible for him to produce good work at the rate and price demanded. This is the old cry of



STREET OF WORKMEN'S COTTAGES, SEVENOAKS, KENT. T. G. JACKSON, R.A., ARCHITECT.

the unprofitable servant, and it has not improved with age. There is no doubt that a great improvement could be effected if master-builders, master-masons, and others in authority, only tried to train their eyes and hands; but they won't and don't; and it is not to be expected that those in their employ will set them an example. A bricklayer's whole duty is not simply to lay bricks in a straight line, nor a mason's to square a stone with exactitude. There is more for them to learn than that; and if they only had a fraction of the sense of what constitutes beauty in plain walling or proportion in solid masonry, we should see better work than that in the average building. True, the architect (or his equivalent) is much to blame. The workmen are only translating his design into solid substance, and in many cases it is not their fault if the result be appalling. Yet, while the artizan remains as painfully incapable of knowing good from bad, how can he expect to be given a free hand in the execution of a design? There are those who believe that the hope of architecture lies in a return to the methods of the Middle Ages. There was never a greater fallacy. The change which has taken place since those days is irrevocable while we remain a world-power, and no permanent good will attend any scheme which tries to evade modern conditions. The only hope is to attempt to alter the modern builder's and the modern workman's idea of good building—for both are wilful victims to false ornamenttation, dummies and shams—and to engender in them a true love for their work. That is the problem. The difficulty is how to solve it. This most certainly will be done by individualism and not by collectivism. It is the unit which is at fault.



ST. BRIDE'S CHURCH, PARTICK, GLASGOW: VIEW OF CHAPEL AND NAVE ACROSS CHANCEL. P. MACGREGOR CHALMERS, ARCHITECT.

MEN WHO BUILD.

No. 66.—P. MACGREGOR CHALMERS.

IT is always difficult to form a just estimate of the work of an artist; but the difficulty is greatly increased if he be a contemporary. His work is of necessity incomplete and out of focus, so that it may be unduly prominent or, on the other hand, too great to be adequately appreciated at so short a range. To counterbalance these disadvantages, however, one has naturally a greater knowledge of a contemporary as a man than any writer of a subsequent generation can hope to obtain. And it is necessary, even in an approximate manner, to form some estimate of every man who is adding to the history of his art. Of these one of the most prominent in Scotland is Mr. P. Macgregor Chalmers.

Mr. Chalmers is, by profession and temperament, a church architect. He possesses that feeling of religious earnestness which dominated the mediæval master-craftsman, and which consequently is reflected in all his work. His simplest church never degenerates into a hall which might be used for any secular purpose, but always preserves for the worshipper the feeling that he is in the house of God. And this, when one analyses it, is the sole reason for church-building; for if a church is built only to contain a certain number of people for a few hours every week, this function might be performed by most public halls and the building of churches be abandoned.

Mr. Chalmers considers that the chief purpose of a church is to stimulate worship. This being the idea with which he starts, it is most natural to find that his church exteriors are very simple and reserved and that he concentrates his thought and expends what money may be at his disposal on his interiors, believing that the inside of a church should always be made more attractive than the outside. And to this end he abjures plaster, and wherever possible finishes his churches inside in stone, which he makes not only monumental but interesting by utilising it as a field for appropriate symbols and texts carved on the surface. These are not at all obtrusive—in fact, they require in some instances to be sought out; but this must afford those worshippers who make these little discoveries a vast amount of pleasure. His churches, moreover, show that thought has been expended on even plain wall-surfaces. Mr. Chalmers was the first to introduce glass mosaic in his church memorial work. He uses rich colouring wherever possible.

As a result of his studies of the art of the early Christian period as left to us in sculptured stones, &c., we find Mr. Chalmers employs much interlacing and so-called Celtic work. In every case we find he has that love for sound material and good workmanship, both fitly employed, which characterised the mediæval craftsman, preferring rather to be content with plain stone and wood and iron and to allow the material to tell its own tale, than to have counterfeits of more expensive materials covered with meaningless misapplied ornament.

Mr. Chalmers has the *perfervidum ingenium* of the true Scot, and perhaps as much as any has realised the truth of Tennyson's lines:

> "He is the true cosmopolite
> Who loves his native country best."

His work, therefore, is naturally expressive of this feature of his character. His churches are always distinctively Scottish: they are of the soil, and appear to grow naturally from it. Thus we find that he never uses the Perpendicular style, which so many architects in Scotland affect, but which was peculiar to England in mediæval times. He rather prefers the earlier styles; but if he needs to use the later style—as, for example, in a restoration—he employs the French Flamboyant with the added Scottish charm. He has also made a special study of Norman, which he believes to be the most effective for simple and inexpensive work, though it may be elaborated to any extent. With it he gets a breadth and simplicity which is very refreshing after the self-conscious "fussy" work which we see all around us. This is well illustrated in his churches at Govan and Carnoustie.

In early life Mr. Chalmers attracted the notice of the late Dr. John Macleod, of Govan, and was largely employed by him on his church work. When the scheme for church extension for the parish of Govan—one of the largest schemes of the church—was proposed, he was appointed architect, and is still engaged in the work. The preparation for this scheme occupied several years. As the intention was to build churches perfectly suited to the Presbyterian service, combined with true ecclesiastical effect and at the most reasonable cost, Mr. Chalmers matured the type of plan seen in St. Bride's Church, Partick. This church accommodates 800 persons, and has a hall adjoining which accommodates 300. The total cost of these works, including oak fittings &c., was £4,185, or at the rate of 4¼d. per cub. ft.; yet, as will be seen even from the photograph, the work is very far from being starved or plain-looking. The church consists of a nave, separated from the single galleried aisle by a stone arcade, a chancel with choir stalls, a side chapel, organ-chamber and baptistery. A hall and vestries adjoin.

This is the type of plan which, with variations to suit the site, Mr. Chalmers has used for most of his city churches. Its chief feature is, of course, the single side aisle, by using which and by keeping the front of the gallery back to the inside line of the piers he gets quite a cathedral length to his city churches. In his village churches at Cardonald and Stepps the gallery is dispensed with, the side aisle is made much lower, and more variety is given to the outlines of the building. At Ardwell an elegant spire has been added, while to another Mr. Chalmers is building a very fine Scotch crown.

Although quite a young man, in addition to his architectural work Mr. Chalmers has found time to study work of a co-ordinate nature. By his researches at Glasgow Cathedral, at Jedburgh Abbey, and elsewhere, he has established considerable reputation as an antiquary. He believes in going to the root of the matter wherever possible; and while ready enough to propound theories, he is still more eager, by excavation and thorough examination of every nook and corner of an ancient building, to confirm them. The architect makes the ideal archæologist. Mr. Chalmers' own studies as an architect have enabled him more than most antiquaries to discover the true spirit of the workers of the past and to imbue his own work with the same feeling.

His publication of the result of his researches has naturally led to his employment in the restoration of old fabrics. For about two years he was engaged in restoring the ruined walls of Glenluce Abbey, under the direction of the Hon. Hew Dalrymple. He has also restored the walls of the ancient chapel at The Isle, Whithorn, for the Right Hon. Sir Herbert Maxwell, Bart., M.P.; and the fifteenth-century tower at Kilmun for H. J. Younger, Esq., of Benmore. He has also restored the old churches at Inverkeithing, South Queensferry, Crailing and Kilmun. He is at present engaged in restoring the beautiful fourteenth-century church of St. Monans, Fife, for William Baird, Esq., of Elie, and is also employed in designing the furnishing and seating of the nave of Glasgow Cathedral.

He has published the following works:—

"St. Ninian's Candida Casa," which is an effort to discover the site of the first Christian church in stone erected in this country. This is combined with an effort to elucidate the evolution of the transeptal plan.

In "A Scots Mediæval Architect" Mr. Chalmers gives us a biography of John Morow or Murray, a fifteenth-century architect whose name and list of works at St. Andrews, Glasgow, Melrose, Paisley, Lincluden, and Whithorn are carved on a tablet on the walls of Melrose Abbey.

"Art in our City (1896)" is an appreciative criticism of the work of contemporaries in Glasgow, emphasising the greater need for attention to æsthetic requirements in the monuments of our modern cities.

"Glasgow Cathedral: A Sketch for its History" is the latest work Mr. Chalmers has published—though he has several in hand, including one of this cathedral for Messrs. George Bell's series. Work upon this cathedral has engaged his attention during the leisure of many years, and his contributions to its history are recognised as of the greatest value. In all his studies it is apparent that no pains are spared to get at the facts. Not only are the historical documents carefully investigated, but Mr. Chalmers has had sufficient influence to interest the Government in his researches, and has on several occasions been granted permission to carry out special work in the foundations of the Lower Church which have brought to light many interesting facts.

In addition Mr. Chalmers is an eloquent lecturer—his lecture on "The Abbeys and Cathedrals of Scotland" being especially fine—and he is also an enthusiastic architectural photographer. He was one of the first of that small band which founded the Glasgow Architectural Association, and for several years he was its president. He has also been president of the Architectural Society.

This short account is a record of one who is ardent and enthusiastic in the pursuit of his profession, and who has always set a high ideal before him.

In Memory of John Ruskin.—Mr. Henry Willett, of Arnold House, Brighton, has made an interesting and valuable gift to the Ashmolean Natural History of Oxfordshire. It consists of a piece of ground about five acres in extent, comprising woodland, marsh, bog and water, and contains many local and rare specimens of animal and vegetable life. Mr. Willett's wish is that the land shall be known as "The Ruskin Plot," and that it shall be kept for all time in its natural condition. In order to ensure this a trust is being prepared which will vest the plot in trustees. Mr. Willett has done for Oxford what the generosity of Mr. Walter Rothschild had accomplished for Cambridge in securing for that University a piece of Wicken Fen, the haunt of the swallow-tail butterfly. The ground is situated at Cothill, near Abingdon, Berks, and is not meant so much for collecting purposes as for observation. It is hoped that a systematic record year by year of a piece of ground uninterfered with by cultivation, will be of itself of considerable interest.

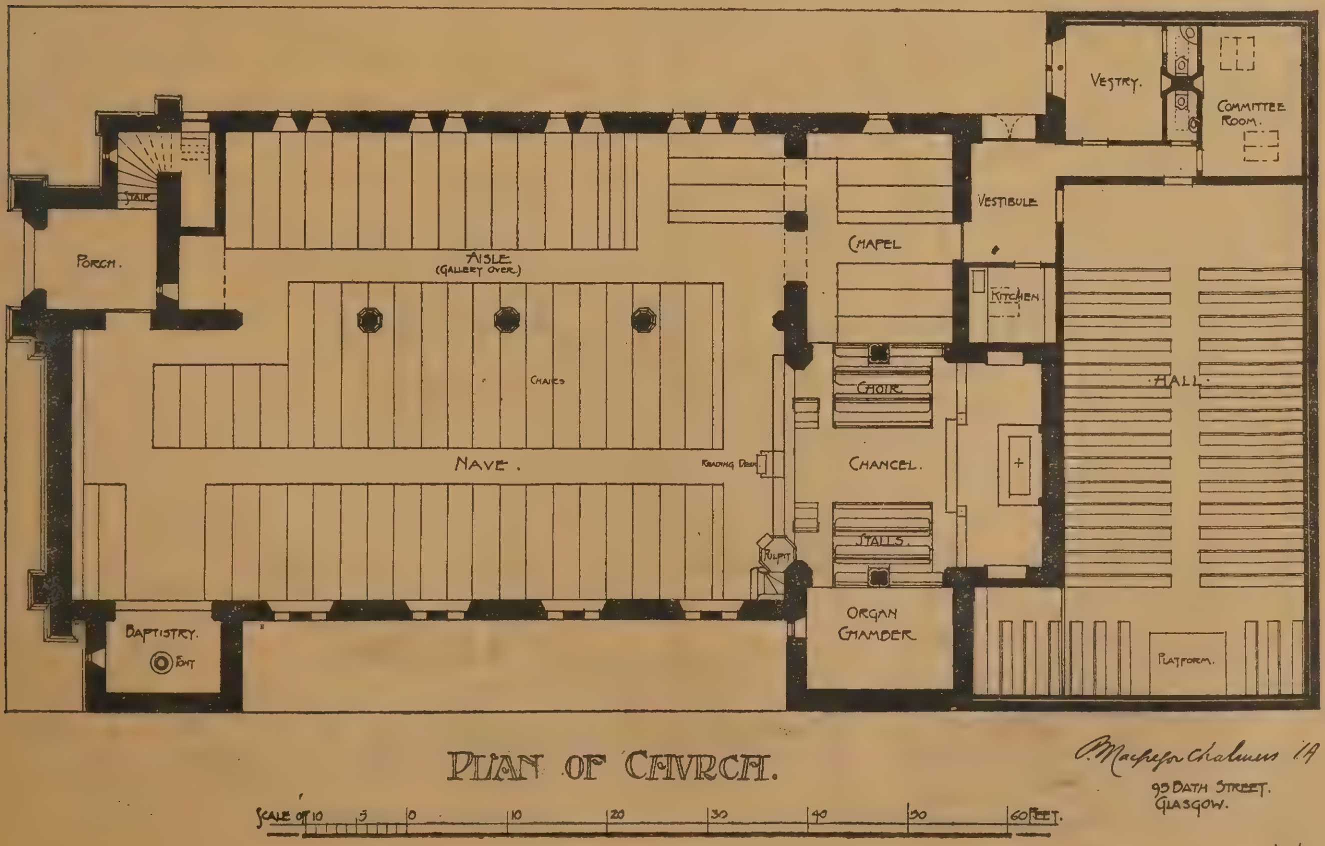
NEW CHURCH AT BLAIRS.

A CHURCH at St. Mary's College, Blairs, was opened last Wednesday. The altar is by Messrs. Pearse & Sons, Dublin. The front, of white Carrara marble, is divided into three panels, the centre one containing a representation of Leonardo da Vinci's famous picture, "The Last Supper," cut in high relief. The tabernacle is of beaten brass. Mr. Robert Curran, of Warrington, is the architect. The church is in the middle period of Gothic style, with distinctively Scottish features introduced in the details. It is built of Rubislaw and Kemnay granite, the finely-hammered dressings being of the latter stone, while granite quarried on the Blairs College estate has been utilized for the rubble work and less conspicuous masonry. The tracery of the windows is of freestone, of a colour which harmonizes very well with the harder grey stone. The building, which is cruciform in plan, is 120ft. long, with a nave 35ft. wide, and having side chapels 22ft. long and 17ft. wide. There is a square tower at the north-east corner, with angle buttresses surmounted by pinnacles. Provision has been made for the erection of a spire rising to a height of over 120ft. The roof has been covered with slates of two tints—blue and purple.

Internally the church is divided into sanctury, choir and nave. The fittings are composed of oak and pitch-pine, elaborately carved stalls and rails, with an open-timbered roof. The choir is seated for over 120 students, and in the body of the church accommodation is meantime provided for about 140 people. The choir stalls were supplied by Messrs. Mayer & Co., the well-known church furnishers, of Munich and London. The organ, which is being built by Mr. E. H. Lawton, Merkland Road East, Aberdeen, will be placed in a specially-constructed recess on the north side of the church.

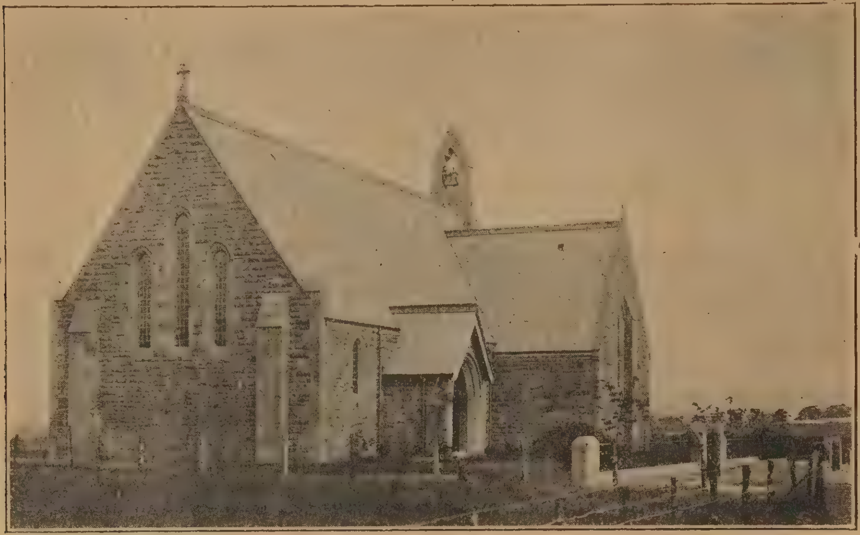
The church has cost about £12,000; and the contractors for the various works were: Mr. Robert Buchan, mason; Messrs. M'Robbie & Milne, carpenter; Mr. J. Bannochie, plasterer; Mr. Edward Copland, painter; Messrs. Thom & Strachan, plumber; and Mr. J. Fyfe, glazier—all of Aberdeen.

SAINT BRIDE'S CHURCH. PARTICK:



PLAN OF CHURCH.

P. Macgregor Chalmers I.A
95 Bath Street.
Glasgow.



STEPPS CHURCH, GLASGOW. P. MACGREGOR CHALMERS ARCHITECT.

SOCIETY OF ARCHITECTS.

THE annual general meeting of the Society of Architects was held on Thursday last at St. James's Hall, Piccadilly, W., Mr. Walter Emden presiding. The minutes of the previous meeting having been read and confirmed, Messrs. C. Bagot, of Deansgate, Manchester; Clayton Botham, of 128, Queen's Road, Brighton; and H. C. Lander, A.R.I.B.A., of Arundel Street, Strand, W.C., were elected members of the Society, and Mr. A. H. Weeks, of Bristol, was elected a student. Mr. Ellis Marsland, hon. secretary, then read the report of the Council for the year ending October 31st, 1901, which stated that the past year has been one of progress and development. A large number of applications for membership had been received, resulting in the addition of 23 new members, while the students' register had also increased, the total membership now being 592, the highest yet recorded; 2 members had died, 14 resigned, 3 had been removed from the list, and 3 studentships had lapsed. The half-yearly examinations to qualify for membership had attracted an increased number of applicants, of whom seven were successful; one candidate, Mr. A. A. H. Scott, being awarded the silver medal of the Society. The syllabus of examination had been revised and strengthened.

The Council had had under consideration the advisability of publishing a form of building contract. It had also considered the question of providing lectures or other means of instruction for students of the Society. The question of forming a technical circulating library for members is still engaging the attention of the Council.

Two competitions had been held during the past session, open to students of the Society only, of whom five entered, the successful competitors being Mr. G. E. Mitchell, of Lowestoft, and Mr. A. T. Thompson, of Buxton.

The Council had continued its policy of keeping before the profession the question of statutory registration, and meetings were convened and held in Edinburgh and Glasgow in May. Only small meetings resulted, but at Edinburgh the usual resolution approving the principle of statutory registration was passed; while at Glasgow, though no resolution was put, a paper was read and discussed and the matter brought before some of the leading architects. As invariably the case, no opposition was offered to the proposal, and the Society will not relax its efforts in working for a principle which it believes to be for the ultimate advantage of the public and the architectural profession.

The Society of German Engineers having invited the Council to appoint some member to co-operate with it in producing an International Technical Dictionary, Mr. G. A. T. Middleton, A.R.I.B.A., member of Council, was deputed, and has since undertaken the work.

It is expected that the balance-sheet which will be presented at the November meeting will show that the surplus funds of last year have been considerably augmented.

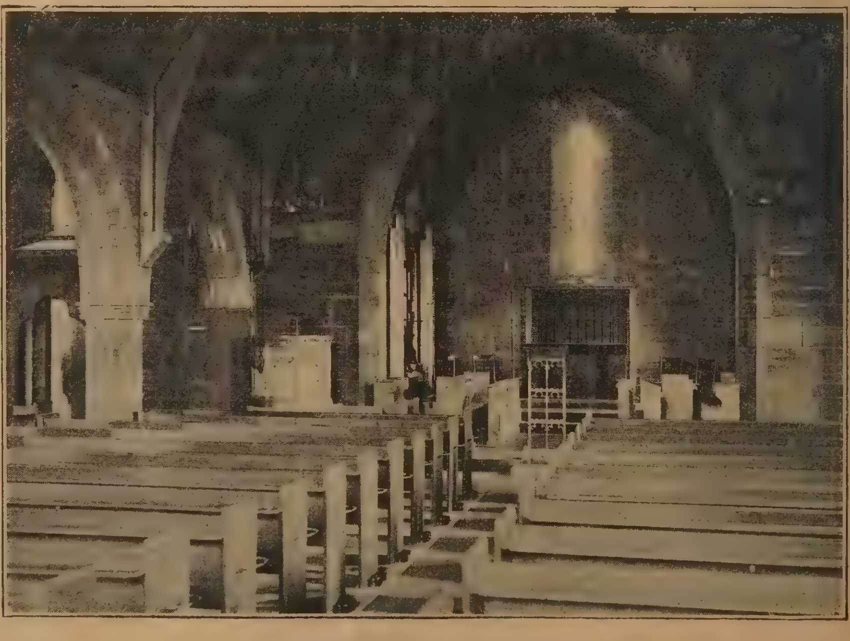
While the Society continued year by year to increase its membership and extend its influence, there was still plenty of scope for further efforts, and its resources can be developed and increased in proportion as the membership grows. The retirement from office of the president, Mr. Walter Emden, L.C.C., who had for four consecutive years untiringly and generously devoted himself to the interests of the Society, was referred to, and the Council desired to place on record its appreciation of his ready and valuable services.

The result of the ballot for officers and members of the Council was then announced as follows:—President, Mr. Silvanus Trevail, F.R.I.B.A., J.P. (Truro); vice-presidents, Messrs. Walter W. Thomas (Liverpool) and G. Gard Pye (London); hon. secretary, Mr. Ellis Marsland (London); hon. corresponding secretary, Mr. W. Cooper (Hastings); hon. treasurer, Mr. H. G. Quartermain (Merton); hon. auditor, Mr. J. Bartlett; council, Messrs. R. G. Bare (London), W. R. Bryden, F.R.I.B.A. (Buxton), Charles Caine (Manchester), J. Williams-Dunford (London), J. W. Dyson (Newcastle-on-Tyne), W. L. Grant (Sittingbourne), W. J. Jennings, F.S.I. (Canterbury), W. R. Mallett, F.S.I. (London), G. A. T. Middleton, A.R.I.B.A. (London), A. E. Pridmore, F.S.I. (London), J. H. Richardson (London), and W. A. Scott, A.R.I.B.A. (London).

Mr. Emden then wished the society a continued successful career, and referred in complimentary terms to the new president, Mr. Trevail, who was unable to be present. Mr. G. Gard Pye then proposed and Mr. B. J. Tucker seconded, Mr. J. H. Richardson supporting, a vote of thanks to Mr. Emden and the officers and council for their services, and Mr. Emden and Mr. Marsland briefly acknowledged.

A BIRMINGHAM THEATRE.

THE Theatre Royal, Birmingham, with all the adjoining premises lying between Temple Street and Colonnade Passage, will be pulled down shortly, and a large block of buildings will be erected. Mr. J. Edwin Forbes is the architect, and Mr. J. Charles the builder. The New Street front will have an elevation in the English Renaissance style of the modern school. The first two storeys are designed to be built of red granite, with a recessed couple-columned colonnade above, and the upper portions are to be of terra-cotta. The architectural effect is gained by projection rather than detail. The central entrance will be to the Arcade, which will run a length of about 200ft. and comprise a domed rotunda. There will be an entrance on the left to a restaurant, to be approached by a short flight of steps; while on the right will be the main entrance to the new Theatre Royal. Access to the upper part of the house will be given by double staircases, mounting one within the other, so that whilst a far greater number of people are given ingress, space is closely economised and safety is better assured. To the various parts of the theatre there will be in all nine emergency doors. The orchestra will be almost hidden in a well sunk in front of the stage and possessing sounding qualities arranged on a plan that has found favour in German playhouses. The lighting will be so arranged that the glare that tries the eyes during an interval will be avoided. The question of ventilation has been carefully considered, and heated air will be drawn from behind the stage to all parts of the house. The bars are to be placed in between the floors, and disconnected from the auditorium by corridors, which will diminish any passage of sound. The auditorium will include eight rear and six stage boxes. The plans provide for as many as eighteen dressing-rooms, with a bathroom on every floor and a green room. The main entrance to the theatre will be treated in Italian marble, and painted figures will be largely utilised in the scheme of internal decoration. The Arcade running from New Street to Stephenson Street is not the least prominent feature of the reconstruction. It will be of lofty proportions, and will contain fourteen shops.



STEPPS CHURCH, GLASGOW.

SANITARY ARCHITECTURE.

By MARK H. JUDGE.

On October 17th the second of the series of lectures on Sanitary Building Construction at the Carpenters' Hall, London Wall, was given by Mr. Mark H. Judge, A.R.I.B.A., F.S.I., Associate of the Society of Medical Officers of Health. The lecture was illustrated by sketches on the blackboard. Mr. Judge said:—

The subject of my remarks is the art of planning and constructing buildings, and therefore the title "Architecture" would have sufficiently described what I am about to say; but with the immense growth of populations and the concentration of people in cities, with the busy lives we all live in consequence, it is often desirable to emphasize a simple description by the use of an appropriate adjective; hence I have made the title of my address "Sanitary Architecture." The architect is the chief workman; and as an architect speaking to clerks of works, builders' foremen, and others who have or hope to have to deal with the construction of buildings I desire to speak as from one workman to others.

Design is our starting-point, and in this the planning should be our primary consideration. With regard to site and aspect I do not propose to deal. Both are large questions, and every separate case must be dealt with on its own merits. In cities there is often no choice, and even elsewhere the situation, contour of the land, &c., often make it necessary to vary planning in relation to the points of the compass.

Planning.

Given the site and having the aspect of our building settled, the first consideration therefore should be to so design the plan of our building that it may best serve the purposes to which it is to be devoted. Doors for access at all convenient points, windows to secure ample light and ventilation, well-lighted corridors to separate and give access to the different apartments, will always give an irregular outline which will lend itself to architectural effect. This irregular outline, so desirable from an artistic point of view, will be accentuated where the water-closets, lavatories and sinks are so placed that disconnecting ventilation between these arrangements and other parts of the building is secured by means of lobbies with windows in opposite walls, which is the only method by which a through current of air can be obtained without complicated devices beyond the control of the ordinary residents. In this and all other matters connected with a building it should always be our aim to so contrive that when it is handed over to those who are to occupy it there shall be as little need as possible for the intervention of greater skill than the ordinary occupants may be reasonably expected to possess. In so far as specially-skilled workmen may be necessary to ensure a continuous satisfactory condition of the building, in just so far have those responsible for its construction proved their want of skill either in design or workmanship.

Elevations, Sections and Roofs.

Having planned our rooms, corridors, &c, we proceed to design our elevations, sections and roofs, and here again the uses to which the building is to be put should be the first consideration. As the human face is an index of the character of the individual, so should the elevations of a building indicate the purpose for which the building was erected. There should be no attempt at deception. Where a rain-pipe is necessary the intelligent man desires to see that it has been provided, and is annoyed with a façade erected as if a rainy season never existed. He will also know that the pipe buried in the wall may prove a source of danger to the building at any moment, and only through necessity would he make such a structure his place of abode. If this is important in the matter of rain-pipes, it becomes doubly important with pipes from sanitary fittings, despite the retrogade action of the London County Council in the matter of soil-pipes. Until this year the by-laws of the London County Council provided that all soil-pipes should be outside the building. It is not within my province in this address to consider the question as to whether it is desirable that the State or the municipality should have power to make and enforce such a by-law as the one to which I have referred, but I have no hesitation in saying that sanitary architecture requires all such pipes to be outside, and further it maintains that these pipes, being necessary, should be provided for in and form part of the design of the elevation of the building to which they are essential.

By-laws and Soil-Pipes.

For some years the by-laws of the London County Council, under the Public Health (London) Act, 1891, provided that every soil-pipe in connection with a new building should be outside the building. This definite by-law has now been repealed, and, with the approval of the Local Government Board, another has been substituted under the Metropolis Management Act, 1855. This new by-law runs as follows: "A soil pipe in connection with a new building or an existing building shall, whenever practicable, be situated outside such building." Of course there is nothing more practicable than the fixing of a soil-pipe in the open in connection with any building, new or old, where the will exists, but the words "whenever practicable" in the new by-law must be read in connection with the rescinding of the old by-law, which was imperative and insisted on every soil-pipe being fixed outside. But none the less the absurdity of the present regulation may be illustrated by suggesting a by-law on similar lines with regard to open spaces at the back of buildings. Imagine the London Building Act amended by rescinding section 41, wherein it is enacted that "there shall be provided in the rear of every building an open space exclusively belonging to such building, and of an aggregate extent of not less than one hundred and fifty square feet." Having rescinded this definite regulation to follow the example of the London County Council, Parliament would enact a section in the following terms: "An open space in connection with a new building shall, whenever practicable, be provided in the rear of such building." The permission such a regulation might give for the erection of back-to-back dwellings would not be taken advantage of by anyone concerned in the erection of buildings which could be described as claiming to be in any way associated with sanitary architecture, and it is to be hoped that the by-law which permits buildings to be so designed that it is impracticable to fix a soil-pipe outside of them will not be taken advantage of by any who may be looked upon as worthy workers in the art and craft of building.

ST. KENNETH'S CHURCH, GOVAN, GLASGOW. P. MACGREGOR CHALMERS, ARCHITECT.

Details.

Our design must provide for secure foundations, for reliable damp-proof courses at suitable levels, and on all the lower floors it is desirable to have solid floors bedded on concrete. Externally, care should be taken to provide for the underside of all projections being throated to protect the walls from wet. Copings, sills, tops of cornices, and other projections should be weathered—*i.e.*, sloped to drain water off—and where the material is not impervious it should be covered with lead or other metal, or with slates, tiles, or a rendering of cement trowelled to a smooth face. String-courses must not be considered as merely ornamental. When properly constructed they serve to protect the walls from wet.

The wood sills of window-frames should be sunk and weathered, and where bedded on stone sills should have a metal tongue to keep out wet. Cased window-frames with double-hung sashes should have a rail between the sill and the lower bead as protection from rain, driven under the sash, and to allow the lower sash to be raised some inches to secure ventilation without draught in the lower part of the room, through the meeting rails of the two sashes. This is a better method than the practice of putting in a slip of wood below the bottom sash. Solid frames with casement sashes are best with the sashes hung to open outwards, and for purposes of ventilation it is always desirable to have opening fanlights above the casement sashes.

On the upper floors great care should be taken in the construction of the hearths for fireplaces, and perhaps the best plan to adopt is to fix a steel or wrought-iron cambered box with solid concrete to receive tiles or other facing to the hearth. The box to have a flange screwed to the trimmer, and to have a bearing between two courses of brickwork in the chimney breast.

To secure a water-tight roof attention must be paid to the inclination where slates or tiles are used; and where flat roofs are constructed especial care must be taken that the structure is of sufficient strength to prevent sagging or settlement, whether finished with concrete or asphalt or covered with lead or other metal. A slight sagging or settlement with pitched roofs covered with slates or tiles might be of little or no detriment to the building, but would be very serious with all kinds of flat roofs.

Drains.

With detached houses, all drains should be external to the building. In cities where houses are in terraces and the sewers in the public roadways, the drains are often of necessity under the buildings, but in no case should there be junctions under the building, and there should

ARDWELL CHURCH, WIGTOWNSHIRE. P. MACGREGOR CHALMERS, ARCHITECT.

be an inspection chamber on each side of the building, *in the open air*, to afford ready access for examination and testing the drain under the building. Inspection chambers are also desirable at all points where it would be necessary to have access to the drains for a thorough examination and test.

Drain pipes are made of stoneware, concrete and iron. Except where a reliable foundation cannot easily be secured, stoneware must, I think, always retain its superiority over concrete or iron, as when well glazed and of sufficient strength it fulfils all the requirements of a perfect drain. It is impenetrable by air or water; it permits perfectly air-tight and water-tight joints to be made between pipe and pipe, so that the drain when finished may be practically one pipe; it is imperishable in use and can only be destroyed by breakage. The floors of inspection chambers should be entirely of stoneware where the drains are of stoneware, and of iron where the drains are of iron. Good work, however, may be done where the channels only are of stoneware or iron as the case may be, with the benchings formed in cement, but it is better for the entire floor, channel and benching to be of the same material as the drain.

All connections with house drains should be outside the house, and the only pipes which should be directly connected to house drains are soil-pipes and ventilating pipes. Rainwater, waste-water and surface drainage should pass into the house drain through some kind of trap, of which there are many varieties.

Air-Inlets and Ventilation.

Arrangements for providing a free passage of air into drains on the house side of outfall traps, to form an air break or disconnection between sewers and house drains, are now admitted to be necessary by all sanitary authorities; indeed, the principle involved in their use is the cardinal principle of modern sanitary architecture. By means of the outfall syphon trap, with an air-inlet, which when near to buildings should be above all windows, and outlet ventilation above the roof, a building is thoroughly protected from the ingress of sewer air. That it is important that the admission of sewer air to our dwellings should be prevented is universally admitted, even when no infectious disease germs are present in the sewers, but it is often a matter of life and death. Who, indeed, would be bold enough to assert that the miles of London sewers into which every house is supposed to drain in this great Metropolis, with its five millions of inhabitants, is ever free from infectious disease germs? These sewers drain alike the palace and the worst tenement dwelling in which poverty and ignorance breed disease and invite death. With perfect house drains, properly disconnected from the sewer, the inhabitants of a town dwelling may enjoy the blessings attendant upon cleanliness; but without such disconnection from the public sewer the cleanest possible household must share the dangers resulting from the sins of others against the laws of health.

In ordinary practice the ventilation of house drains can be effectively secured by continuing the soil-pipes up to the roof, full bore. As I have already said, wherever practicable—and in all new buildings of course it is practicable—soil-pipes should be fixed outside the building; for ordinary buildings, where economy in cost is specially to be considered, strong iron pipes have an advantage over lead, inasmuch as that, while for all practical purposes they are as good, they are less expensive and are less liable to be injured by ladders, &c. In cases where the first cost is not one of the principal considerations, of course strong lead pipes should always be used.

All iron used in sanitary work should be protected by galvanizing or by a coating of Dr. Angus Smith's solution.

Sanitary authorities are not agreed about the use of cowls in connection with drain-ventilating pipes; while some recommend them others dispute their use. There can be little doubt, however, that whether cowls are or are not useful in special cases, they are not necessary for the ventilation of house drains. A 4in. ventilation pipe, open at the top, well above the roof, with the sides perforated near the end, is a simple and effective outlet ventilator.

Supervision.

To those who may be entrusted with the duty of supervising the erection of buildings, it is important to secure the intelligent co-operation of the whole of the workmen. The supervisor should regard each man as an intelligent craftsman, responsible for the quality of his work and in a measure for the success or failure of the structure on which he is engaged.

We English need to be reminded of the fact that our workmen are intelligent factors, and the art of supervision should bring this out, which can never be done where the workman is looked upon as a machine. Let all ponder well what John Ruskin has said in "The Stones of Venice": "The modern English mind has this much in common with that of the Greek, that it intensely desires, in all things, the utmost completion or perfection compatible with their nature. This is a noble character in the abstract, but becomes ignoble when it causes us to forget the relative dignities of that nature itself, and to prefer the perfectness of the lower nature to the imperfection of the higher; not considering that as, judged by such a rule, all the brute animals would be preferable to man, because more perfect in their functions and kind, and yet are always held inferior to him, so also in the works of man, those which are more perfect in their kind are always inferior to those which are in their nature liable to more faults and shortcomings. For the finer the nature the more flaws it will show through the clearness of it; and it is a law of this universe that the best things shall be seldomest seen in their best form. . . . . We are not to set the meaner thing, in its narrow accomplishment, above the nobler thing, in its mighty progress; not to esteem smooth minuteness above shattered majesty; not to prefer mean victory to honourable defeat; not to lower the level of our aim, that we may the more surely enjoy the complacency of success. But above all in our dealings with the souls of other men, we are to take care how we check by severe requirement or narrow caution efforts which might otherwise lead to a noble issue; and, still more, how we withhold our admiration from great excellences, because they are mingled with rough faults. Now in this make and nature of every man, however rude or simple, whom we employ in manual labour, there are some powers for better things; some tardy imagination, torpid capacity of emotion, tottering steps of thought, there are, even at the worst; and in most cases it is all our own fault that they *are* tardy or torpid. But they cannot be strengthened, unless we are content to take them in their feebleness, and unless we prize and honour them in their imperfection above the best and most perfect manual skill. And this is what we have to do with all our labourers; to look for the *thoughtful* part of them, and get that out of them, whatever we lose for it, whatever faults and errors we are obliged to take with it. For the best that is in them cannot manifest itself but in company with much error. Understand this clearly: you can teach a man to draw a straight line and to cut one; to strike a curved line and to carve it; and to copy and carve any number of given lines or forms with admirable speed and perfect precision, and you find his work perfect of its kind; but if you ask him to think about any of those forms, to consider if he cannot find any better in his own head, he stops; his execution becomes hesitating; he thinks, and ten to one he thinks wrong; ten to one he makes a mistake in the first touch he gives to his work as a thinking being. But you have made a man of him for all that. He was only a machine before, an animated tool."

On the Importance of Sanitation.

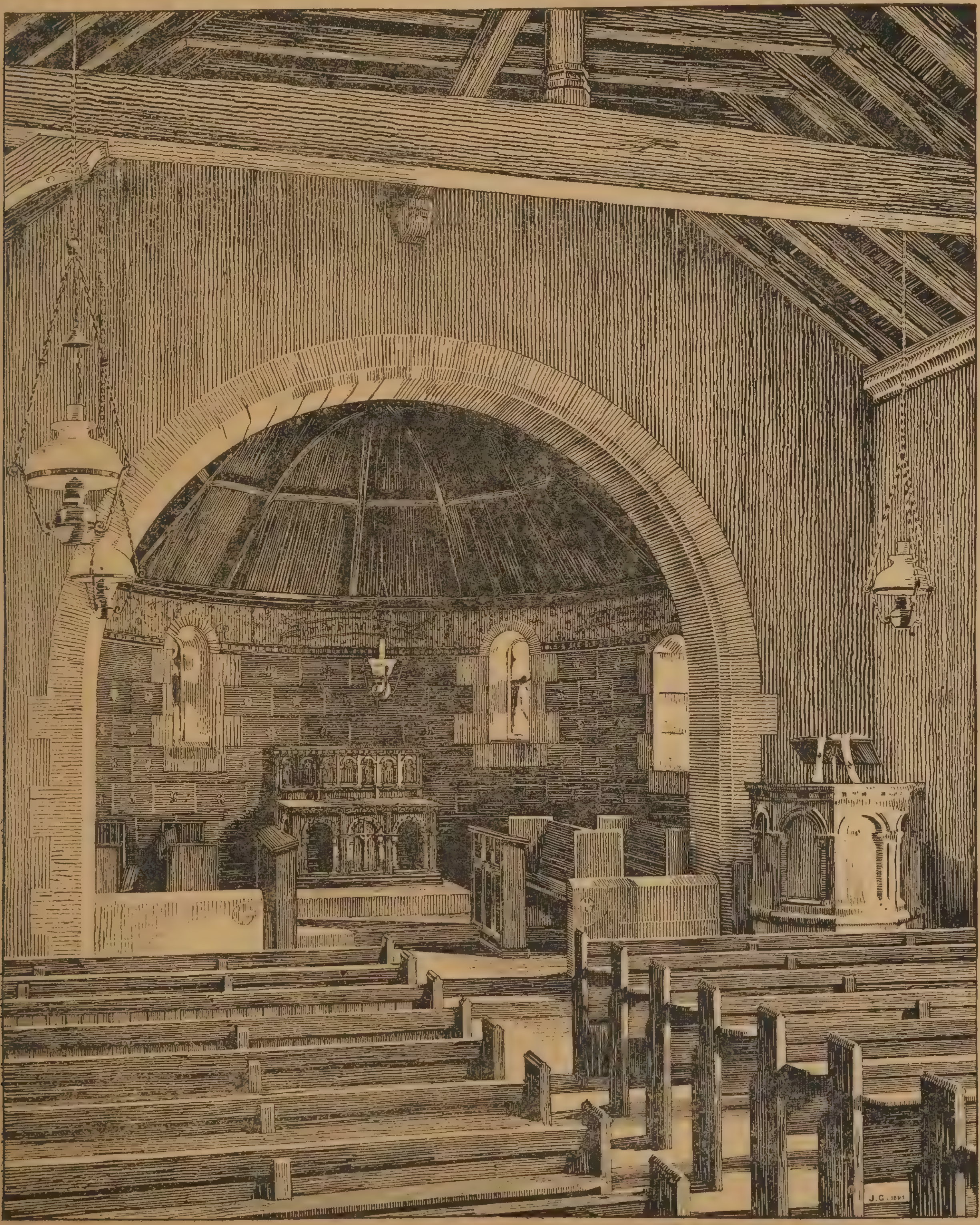
How important the work of sanitary architecture is to the community I cannot better emphasize than by quoting some words by the late John Eric Erichsen, F.R.S., president of the Royal College of Surgeons, when addressing a meeting of the Sanitary Assurance Association. Mr. Erichsen said:—

"We all know that the sound mind in the healthy body is the greatest of all blessings; but in order that the mind may be sound the body must be healthy, and for the health of the body it is necessary that the body should in its daily occupations be surrounded by influences that are, at all events, not detrimental to health. These truths are so self-evident at the present day that they scarcely justify repetition, for if there is any one circumstance which appears to me more specially to distinguish modern civilization, it is the attention that is being paid by the educated classes to the laws and to the study of hygiene. There is nothing, I take it, that more distinguishes the civilized man from the savage, or the educated man from the man who is unenlightened, than the scrupulous attention that the civilized and educated man pays to what is, after all, the first law in hygiene—cleanliness in all the actions of his body and all the surroundings of his home. The culture of the civilized man inclines him to it. It becomes almost instinctive. The knowledge acquired by the educated man compels him to it, for if there is one truth that is more determinedly established by modern science than another it is this—that a vast number of these diseases which devastate mankind are preventable; and being preventable and not prevented, they are self-inflicted. And it is not only those more fatal diseases, the typhus and the typhoid, and the plague and the diphtheria, that are so preventable, and that constantly by want of prevention we inflict upon ourselves. There is also a vast host of the minor diseases that tend to sap greatly the strength and to diminish the happiness of existence."

On the same occasion as that on which the late president of the Royal College of Surgeons made the remarks I have quoted, Sir Joseph Fayrer, M.D., F.R.S., said: "I have become aware of what a great and crying want this sanitation of dwellings has become. I know, and see constantly, how people suffer from the want of it, and it has been always a marvel to me in the present state of culture, intelligence and education how people can have remained so blind as they do remain to the evils that surround them. My firm belief is that it is from want of appreciation of the nature of the causes that produce these evils that proper remedies are not applied. Many people not seeing in their own households what is happening, therefore do not believe it. It is consequently necessary that knowledge should be spread abroad. If people came really to understand that foul emanations come from drains, and that the water we drink if connected with that with which we flush our sewers will cause typhoid fever, sore-throat, and all the train of diseases, they would insist on sanitary architecture."

In conclusion, let me express the hope that what I have said on some of the main principles of sanitary architecture will be of service—will lead to thought on matters of detail connected with the design and construction of sanitary buildings for all sections of the community, and do something to raise the sanitary standard in the homes of the people.

Glasgow Institute of Architects.—The first meeting of the newly-elected council was held on October 18th, Mr. Alexander Petrie, vice-president, in the chair. Office-bearers were appointed as follows: President, Mr. John James Burnet, A.R.S.A.; vice-president, Mr. Alexander Petrie; auditor, Mr. W. Forrest Salmon; secretary and treasurer, Mr. C. J. MacLean. Mr. W. J. Boston, 180, Hope Street, was added to the council in place of Mr. James Miller, resigned. In connection with the Alexander Thomson Memorial Studentship, a committee was appointed to make the necessary preparations for the next triennial competition, to be held in 1902.



CRAILING CHURCH. P. MACGREGOR CHALMERS, ARCHITECT.

LIVERPOOL CATHEDRAL.

SOME FURTHER OPINIONS.

THE discussion about the style of Liverpool Cathedral still continues. In a letter to the "Times" Mr. Robert Gladstone stated that of the competitive designs of 1884 those placed second and third by Mr. Christian were "Gothic" designs, while the first, Mr Emerson's, was for a design specially calculated to be in harmony (as far as possible) with the adjoining classical buildings.

The inference is that his was not a "Gothic" design, but Mr. Emerson points out that it was, in principle, plan, construction and detail, though of an early phase.

Mr. Emerson on his Design.

"The introduction of the dome no more militates against its Gothic character than the dome of Sta. Maria del Fiori at Florence militates against the Italian Gothic style of that church. The fact of the Classic surroundings on the former site was not the only reason for the dome, but also the fact that it is the only logical covering for an enormous open area in front of the choir, which is demanded by modern congregational requirements. The particular phase of Gothic selected was because the larger and broader detail would have been less in contrast to the large scale of the Classic work in proximity to it than the smaller detail of a later period; and also because sculpture and other details could be made more nearly approaching the highest class of work than could be possible without incongruity with the restrictiveness of Gothic of a late period. Were the design translated into later detail, which could easily be done, it would still be Gothic, but of a different phase. As I have no intention of competing a second time, my only motive in writing this is fairness to myself, because I am aware that persons antagonistic to anything but fourteenth-century detail have been good enough to state that mine was not Gothic, which is untrue in every sense of the word."

Where Motives for a New Style might be Found.

In answer to Mr. Reginald Blomfield's suggestion that a hint for Liverpool Cathedral might be found in such buildings as the baths of Caracalla, Mr. Gladstone asked: "Why not also in the Temple of Baalbec or Palmyra or Persepolis—or, for the matter of that, of Timbuktu?"

In answer to this Mr. Blomfield says: "Probably in any one of these buildings a competent observer would find motives (not details) of design which he might translate into a totally different expression, and this is what I suggested when I referred to the baths of Caracalla. Elmes found one motive of design here, and expressed it, somewhat literally, in his splendid room at St. George's Hall; but other architects might find other motives in the fragments of the tremendous vaults and arches of the ruins of Imperial Rome. It seems impossible after fifty years of Ruskinism to drive it into the head of the layman that architecture is not sculpture or painting, but architecture. It may seem a paradox to Mr. Gladstone, but I only state a fact when I say that there are architects nowadays who design in classical architecture and yet are inspired by the Gothic spirit as truly, so far as it goes, as any of the mediæval experimentalists of the thirteenth century, and these are the men with whom lies the architecture of the future."

Mr. J. Oldrid Scott defends "Gothic."

Mr. J. Oldrid Scott protests against the statement that Gothic architecture is played out, and that its use now means nothing but a servile reproduction of ancient buildings. He says: "Nothing could be further from the truth. Look at the grand series of churches, culminating in Truro Cathedral, designed by Mr. Pearson; look at Mr. Bodley's noble churches, or Mr. Austin's, or Mr. Temple Moore's, all founded on a life-long study of old examples, but every one of them full of life and originality, and each of them carefully adapted to the requirements of the place it is built in. The fact is that a critic is not in a position to decide authoritatively whether a building in any style is original or a mere reproduction unless he has acquired a close familiarity with that style. No one admires Mr Blomfield's work more than I do, but I do not consider that his wide knowledge of one style qualifies him for condemning the works of those who practise in another. I plead for a design instinct with the sacred character which appeals to us in our glorious old cathedrals, but at the same time essentially modern in its treatment and adapted in all respects to the spiritual needs of a great modern city."

Protest Successful: The Committee Submit.

At a meeting of the Executive Committee held last Monday it was decided, on the motion of the Earl of Derby, seconded by Mr. Robert Gladstone, that the preliminary competition for the design of the new cathedral be left open; that the time for sending in portfolios be extended till June 30th next year; and that the architects selected to compete in the final competition be paid 300 guineas each for their designs, whether they be accepted or rejected. The competition is not now limited to the Gothic style.

BRITISH SCHOOL AT ATHENS.

THE annual meeting of subscribers to the British School at Athens was held on Thursday last in the rooms of the Society of Antiquaries, Burlington House, Sir Richard Jebb, M.P., presiding. The accounts for the year 1900-1 showed that the total income had been £1,790, of which just over £900 was in annual subscriptions and £500 a Government grant. The report of the Managing Committee stated that His Majesty the King had graciously consented to become the patron of the school. The work of the school, both on the teaching and exploring sides, had been carried on vigorously under the new director, Mr. Bosanquet. The number of students entered was five, as compared with six last year. In Crete excavations were undertaken at Præsos and at Petras. At Præsos only one product of Mycenæan art was discovered, but about a mile away a large house of late Mycenæan work was discovered, and nearer the city two tombs of the same period were found, one a square chamber with a dromos, and the other a well-built beehive tomb. In the same neighbourhood a number of later tombs were opened, ranging from the Geometric period to the fourth century, and containing a large quantity of vases of various periods. Præsos itself appears from the remains discovered to have been an important place from the eighth or seventh century downwards. The remains of three other sanctuaries were also investigated. On a saddle below the Acropolis was discovered a large and solidly-constructed building of late Greek workmanship, with a front 75ft. long, which may, it is suggested, have been an "Andreion," of the kind in which the Cretan citizen met for common meals. Accounts of the discoveries will be published in the forthcoming number of the annual.

At Knossos Mr. A. Evans had continued the excavation of the great prehistoric palace associated with the legends of Minos and the labyrinth. The northern end of the palace and an extensive eastern quarter had been uncovered during the past year, and before the close of the season a triple flight of stone stairs was found leading down to a suite of halls, showing remains of colonnades and galleries. As it appears that the principal state rooms were on this lower level, it may be hoped that next year will give even better results. Considerable progress, the report stated, had been made with the scheme for establishing a British school at Rome, which had begun work, and the director had written a full report on the recent excavations.

Sir Richard Jebb said, in moving the adoption of the report, that the document justified the opinion that the British School at Athens was continuing to fulfil the purposes for which it was founded.

While Crete had been the chief centre of interest, the year had not been barren of interesting archæological events in other parts of Hellas. One, at least, of them deserved special mention. Professor Furtwängler had made a fresh examination of the temple in Ægina, and had ascertained that it was dedicated not to any of the greater divinities but to a local goddess called Aphaia. The temple was dedicated soon after 490 B.C., replacing an older Doric temple of the sixth century.

The British school aimed at advancing knowledge. It also aimed at educating young archæologists. The school at Athens and the recently-opened school at Rome offered the best facilities available to our countrymen for a practicial training in archæological work. It would be of great advantage to the director if he could command the services of another advanced archæologist—or of more than one such colleague—to assist in conducting excavations and in editing the results for publication. They wanted something in the nature of an archæological fellowship in connection with the school, to be tenable for a certain term of years. The French School of Athens actually possessed much of that character.

Mr. Bosanquet made a statement as to the work of the school during the season, and concluded by announcing that Mr. Marshall had been selected as Director-General of the Archæological Survey of India.

Mr. Penrose moved the following resolution: "That Professor Ernest Gardner, Professor Percy Gardner, Professor Pelham, and Dr. Waldstein be re-elected members of the committee; that Mr. Walter Leaf be re-elected hon. treasurer and Mr. William Loring hon. secretary for the ensuing year, and that Mr. R. Mayor be elected acting hon. secretary until Mr. Loring's return; that Lord Lingen and Sir Frederick Pollock be re-elected auditors, and that Mr. Edwin Waterhouse be elected an additional auditor." This was carried, and the proceedings then ended.

Surveying and Sanitary Notes.

A New Sewage Scheme at Maidstone, on the bacterial principle, has been adopted by the Urban District Council. The scheme will involve an expenditure of between £70,000 and £80,000.

The View from Richmond Hill.—The work of devastation on the Lebanon House estate is proceeding daily, more and more of the fine cedars are being felled, and the portion of the Cambridge House Estate still for sale, on which the beauty of the view from the old bridge depends, is already being cut up for drains, roadmaking, &c. Men are actually at work on the meadow in front of the lovely old elms. The Twickenham District Council have agreed to contribute £3,000 towards the £72,000 necessary for the purchase of the Marble Hill estate.

The Breaking-up of London Streets formed the subject of a discussion at a meeting of the Westminster City Council last week. Finally, resolutions were adopted, on the motion of Mr. Alderman Walter Emden, to the effect that the council was prepared to support the London County Council in obtaining powers more effectually to control the breaking up of the streets by various companies on condition that those powers, when obtained, should be placed in the hands of the local authorities, the London County Council being the body to which appeal could be made in case of dispute between the local authorities and any of the companies. Further, that it should be an instruction to the Law and Parliamentary Committee to consider, and, if thought fit, prepare a short Act of Parliament in regard to the opening and excavating of the roads and streets, so as to enable the Council to regulate better the very serious obstructions at present unfortunately permissible. The Council also resolved that the council of each metropolitan borough, the Common Council of the City of London, and the London County Council should be invited to appoint one or two of their members, and their engineer or surveyor, to attend a conference to be held at the Westminster Town Hall, for the purpose of considering the materials and means of paving the streets of London in a way suitable to the requirements of each district.

Correspondence.

Liverpool Cathedral: A Sidelight from the late Cardinal Newman.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It appears that there is really need to fight the battle of the styles over again at Liverpool. As a contrast to the utterances of Mr. Robert Gladstone, may I be permitted to quote some words from a letter written by the late Cardinal Newman more than half a century ago? The letter in which these words occur is, I think, very little known, but is of immense interest as showing that Newman, at so early a stage of the Gothic revival, clearly recognised what the profession took many years to learn, and of what Mr. Robert Gladstone seems yet to be quite unconscious. The letter will be found on pp. 205-7, Vol. II., of "The Life of Ambrose Phillipps de Lisle," published last year. Pugin was then asserting in his dogmatic way that Gothic was the only Christian architecture. Phillipps was as enthusiastic in this belief as Pugin himself. But Newman was of a different opinion. Pugin was building (Roman) Catholic churches up and down the kingdom, but would have nothing to do with an Oratory, for reasons that will be seen below. Newman had the courage of his convictions, and spoke out in no uncertain way to Mr. Phillipps. There are several of his letters on this subject of Gothic architecture, but the one in question is dated June 15th, 1848. It is too long to quote in full, but in any future history of the Gothic revival it should not be overlooked.

"Mr Pugin," writes Newman, "is a man of genius; I have the greatest admiration for his talents . . . but he has the great fault of a man of genius, as well as the merit. He is intolerant, and, if I might use a stronger word, a bigot. He sees nothing good in any school of Christian art except that of which he is himself so great an ornament. The canons of Gothic architecture are to him points of faith, and everyone is a heretic who would venture to question them. . .

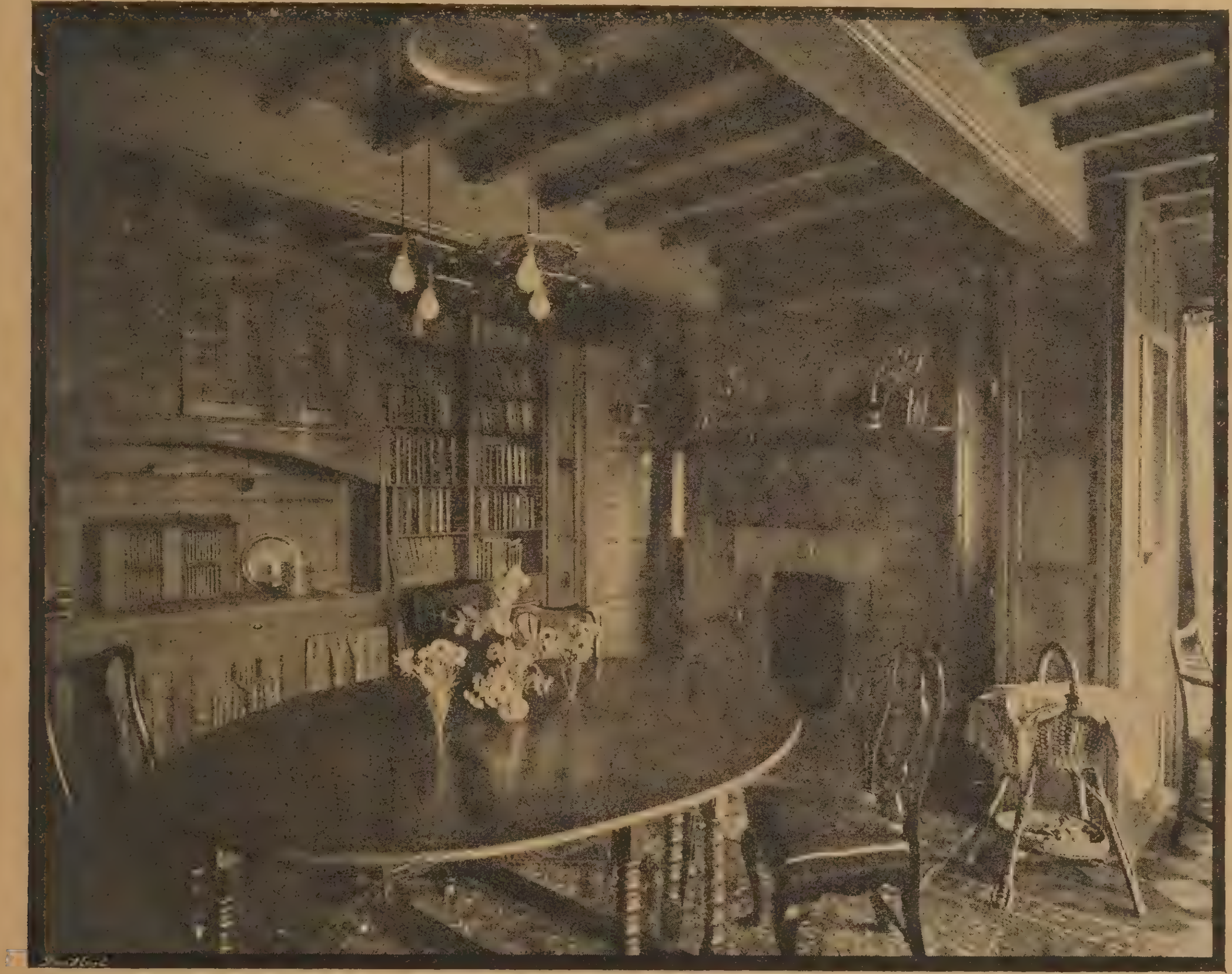
"Now something might be said in defence of this extreme view of the subject, had Gothic architecture prevailed over the *whole* face of the Church. . . . But this is notoriously not so—nevertheless Mr. Pugin, with only half Christendom on his side . . . rules that the other half is, what he calls reproachfully *pagan*. . . .

"Something more might be said for his view of the subject had there been an *uninterrupted tradition* of Gothic architecture from the time it was introduced till the present day; but this even is not the case. Mr. Pugin is notoriously engaged in a revival—he is disentombing what has been hidden for centuries amid corruptions; and, as first one thing and then another is brought to light, he . . . modifies his first views. . .

"But there is even more than this—continues Newman—and what is very important; we know that the Church, while one and the same in doctrine ever, is ever modifying, adapting, varying her discipline and ritual, according to the times. In these respects the Middle Age was not what the First Centuries were—nor is the Age Present the Middle Age. In order, then, that any style of architecture should exactly suit the living ritual of the nineteenth century, it should be the living architecture of the nineteenth century—it should never have died—else, whilst the ritual has changed, the architecture has not kept pace with it. This defect is actually found in the case of Gothic. Gothic is now like an old dress, which fitted a man well twenty years back, but must be altered to fit him now. It was once the perfect expression of the Church's ritual at those places at which it was in use; it is not the perfect expression now. *It must be altered in detail* to become that expression. That is, it must be treated with a freedom which Mr. Pugin will not allow. I wish to wear it, but I wish to alter it, or rather I wish *him* to alter it. *This* is his quarrel with us, not that we do not feel the greatest admiration for the Gothic style, but that we will not allow details which were proper in England in the Middle Ages to be points of faith now." And referring to the immediate point of dispute, the writer adds: "For Oratorians, the birth of the sixteenth century, to assume the architecture simply and unconditionally of the thirteenth, would be as absurd as their putting on them the cowl of the Dominicans, or adopting the tonsure of the Carthusians. We do not want a cloister or a chapter-house, but an Oratory; I, for one, believe the Gothic style can be adapted, developed into the requisitions of an Oratory. Mr. Pugin does not: he implied in conversation with me at Rome that he would as soon build a Mechanics' Institute as an Oratory. I begged him to see the Oratory at the Chiesa Nuova; he gave no hope he would do so. Now is it wonderful that I prefer St. Philip to Mr. Pugin? And is it not wonderful that he should so relentlessly and indissolubly unite the *principles* of his great art with the *details*?"

I have been tempted to quote at some length, as, although every word of the above may not have a direct bearing on the present issue, there is a historic interest in the whole of the letter that must be my excuse for occupying so much of your space. I have only to add that the italics throughout are Newman's own.—Yours truly,

F. H. CHEETHAM.



DINING-ROOM AT "WOODSIDE," CHILWELL, NOTTS. ARTHUR MARSHALL, A.R.I.B.A., ARCHITECT.

"Woodside," Chilwell, Notts.—This is Mr. Arthur Marshall's own house. The dining-room is treated in wainscot oak, and is only 8ft. 6in. high by about 16ft. square. The fireplace recess is lined with dull-green glazed bricks, and the fire-opening has a lintel 2ft. deep of green Irish marble with a projecting shelf. The frieze or panel above is beaten in aluminium. Altogether the effect is unpretentious and good.

Views & Reviews.

Drawing for the Press.

Owing to the increasing demand for illustrated literature of every kind there has arisen a vast school of workers in black and white who form quite a new factor in any estimate of the art of to-day. But, notwithstanding the close attention which has been devoted to the subject, it is undoubtedly true that the majority of these workers do not thoroughly understand the practical limitations of the processes by which their drawings are reproduced; this being doubtless due in large measure (as the author of this book points out) to the fact that the teachers themselves are, as a body, similarly ignorant. And yet such knowledge is emphatically necessary. For instance, an artist who knows that his pen-and-ink sketch is to be reduced considerably will not crowd his lines together so that they become clogged; nor will he forget that the half-tone process tends to give a feeling of flatness, caused by the ruled screen which is employed. Of these and many other matters the writer of this book speaks fully, emphasising his remarks by reference to the numerous illustrations which accompany the letterpress. Specimens of work by such men as Sir John Gilbert, Lancelot Speed, Alfred East, Selwyn Image and Walter Crane are given, in all cases accompanied by some critical remarks which students will find of much interest. The author very properly asserts that "the skilful copies, the facsimiles of engravings and etchings drawn in pen and ink, which are the admiration of the young artist's friends, are of little or no value in deciding the aptitude of the student." He insists that there must be originality as well as care and thought bestowed on every drawing for the press; and in this connection poor Vierge comes in for his share of blame, or rather those who have copied him. Innumerable pen-and-ink artists have formed their style (or a portion of it) on this Spaniard's work, and among them we might name one of the best-known architectural draughtsmen of to-day. The book (which now reaches its third edition) contains many useful hints and should be studied by all illustrators; not the least interesting portion is the chapter on coloured illustration by Mr. J. S. Eland. We might note that, on page 250, J. G. Harper is printed instead of C. G. Harper, and also that the title of Mr. Joseph Pennell's book is not "Pen and Pencil Artists" but "Pen Drawing and Pen Draughtsmen."

"The Art of Illustration." By the late Henry Blackburn. Edinburgh: John Grant, 31, George IV. Bridge price 7s. 6d. nett.

Cretan Archæology.

The recent explorations of ruined cities in Crete have been perhaps the most productive of any during the last few years, and the discoveries already made by Mr. Hogarth and Mr. Evans are entitled to rank as most important contributions to the unravelling of a wonderful and curious civilization, earlier than that of Greece, and yet showing a highly-developed condition. In this book Mr. Evans gives a preliminary study of a branch of the subject, attempting some explanation of the many mystic and religious symbols found, and of the religion and religious ceremonies of the Cretan civilization; and being written by such an acknowledged authority, it is of considerable value, and should be read by all those interested in this subject.

"The Mycenæan Tree and Pillar Cult and its Mediterranean Relations, with Illustrations from Recent Cretan Finds." By Arthur J. Evans, M.A., F.S.A. London: Macmillan & Co., Ltd, price 6s. nett.

The London Building Acts.

A third edition of the late Professor Banister Fletcher's handbook of the London Building Acts has just been published by his sons. The exhaustion of two editions of this work testifies to its value. It is undoubtedly the best book upon the subject. Portions of the work have been rewritten, and the cases which have been decided under the Acts are now brought up to date, abstracts of them being appended to each section to which they refer, so that the interpretation which the Courts have placed upon the working of any particular section is now apparent at a glance. Four new plates have been added, showing the requirements for open spaces in or about buildings, and all revised regulations are inserted up to date. The regulations of the City Corporation with regard to drainage, vaults, areas, hoardings, &c., have also been wisely included.

"The London Building Act, 1894, and Amendment Act, 1898: A Text-book on the Law relating to Building in the Metropolis." By the late Professor Banister Fletcher. Third Edition. Revised by Banister F. Fletcher and H. Phillips Fletcher, Associates R.I.B.A., Fellows S.I. London: B. T. Batsford, 94, High Holborn, W.C., price 6s. 6d.

Engineering Notes.

The New Lighthouse at the Foot of Beachy Head is progressing satisfactorily, though the work, which is accounted one of the great engineering feats of the day, is nothing like near completion. The engineers, however, have accomplished the most difficult portion of their task. The tedious and difficult process of laying a firm foundation, in which an enormous quantity of cement was used, and building the base of the tower, has been accomplished; and now that the workmen are not impeded by the sea, more rapid progress is being made. Huge blocks of granite, many of which weigh over five tons, are being used and conveyed by an overhead cable. The tower has already been carried to a height of 80ft., and is to be 120ft. high. It is anticipated that the work will occupy another year in completion.

A New Tyne Bridge.—The directors of the North-Eastern Railway Company propose to erect another bridge to act as a relief to the now world-famed "High Level" which crosses the Tyne, connecting Gateshead with the city of Newcastle, and which was erected from the designs of Robert Stephenson, and opened for traffic by Queen Victoria in August, 1849. It is understood that preliminary borings have already taken place, and that the necessary land has been acquired. The new structure, which is from the designs of the company's engineer, Mr. C. A. Harrison, of Newcastle, will run from the west end of the Central Railway Station, Newcastle, through a part of the Forth goods' yard, and then curve southward, through a corner of the Forth goods' warehouse, thence proceeding across the Tyne in a southerly direction. The river will be crossed on two psans, resting upon a central pier of granite. Cylinders are to be sunk, and on these the piers will be erected. It is proposed to raise the girders into position from barges in the river, and for this reason a portion in each pier will be left unfinished until all the girders are actually in place. There are five lattice steel girders, each weighing 300 tons, 27ft. in depth and 4ft. 7in. in width. The structure, which is to be for railway purposes only, is to have a width of 49ft. from the centre of one parapet to the centre of the opposite parapet, and will be about 670ft. in length and 110ft. above high-water mark to the highest rail of the bridge. The estimated cost of the undertaking is £477,000.

The Institution of Junior Engineers held its annual general meeting last Friday night at the Westminster Palace Hotel. Mr. Percival Marshall occupied the chair. The secretary, Mr. Walter T. Dunn, read the annual report of the council, which stated that the total membership at the close of the session was 652, as compared with 594 for the previous year, an increase of 58. The number of elections had been 103, which was the largest figure yet recorded. During the year the deaths had taken place of Professor G. F. Fitzgerald, an honorary member, Mr. L. F. Awde, a member of the council, and Mr. E. H. S. Cooper. The institution premium had been gained by Mr. Samuel Cutler, junr.; and a special prize offered by Mr. W. H. Northcott for a paper dealing with the relations of employers and employed had been awarded to Mr. Willian Powrie. New offices had been taken at 39, Victoria Street, Westminster, where the accommodation included a library and reading- and writing-rooms. Sir John Jackson had consented to serve as president of the institution. The income for the past year had amounted to £495 7s. 7d., and the expenditure to £475 0s. 1d., leaving a credit balance on the year's working of £20 7s. 6d. The balance-sheet showed a balance of £150 9s. 10d. in favour of the institution. The report and statement of accounts were adopted. The following officers were elected: Chairman, Mr. Percival Marshall; vice-chairman, Mr. Kenneth Gray; hon. librarian, Mr. Lewis H. Rugg; hon. auditors, Mr. H. B. Vorley and Mr. W. H. de Ritter; secretary and treasurer, Mr. W. T. Dunn. On the proposition of Mr. P. J. Waldram, seconded by Mr. A. H. Tyler, a motion was passed authorizing the council to make arrangements to further the speedy exchange of technical information between the members themselves and between the members and the discussion section of the Architectural Association.

Builders' Notes.

Examinations of the Worshipful Company of Carpenters in sanitary building construction will be held on November 21st and 23rd, and not as advertised in our issue of October 9th.

Subsidence of Foundations.—Last week the Marylebone Board of Guardians had under consideration the report of the expert appointed by the Royal Institute of British Architects to enquire into the recent subsidence of part of the foundations of the new workhouse in Marylebone Road. "The cause of the subsidence," says the report, "is rather difficult to determine, but excavations have revealed a layer of watery sand at a depth of 17ft., overlaid by a layer of clay. This, together with the vibration from the heavy coal trains on the Underground Railway which run during the night, is probably the cause of the trouble. Should the cracks reappear and show signs of spreading, it would be advisable to consider the question of underpinning."

Collapse of a Building near Cardiff.—A riding school at Druidstone, near Cardiff, collapsed last week. The building was a large wooden structure on the point of completion, and erected at a cost of about £800 by Mr. Herbert B. Cory. About a score of workmen were engaged inside boarding the walls, while some of Mr. Cory's own men were ploughing up the floor when the accident occurred. Mr. Cory and his manager, Mr. Balfour, directed their attention to extricating the injured men. The case of William Pearce, carpenter, proved fatal. Among the most seriously injured was a lad named Spooner, who had only begun to learn his trade that week. The accident is attributed to the giving way of one of the girders.

Death by Accident.—Edwin John Aston, twenty-two years of age, a mason living near the Speech House, was engaged last Saturday week at Howbeach, near Blakeney, pulling down some old colliery buildings, with the materials from which masons were rebuilding a culvert, when two tons of stonework fell, a considerable portion of which struck Aston so severely that he died a few minutes afterwards. It appears that deceased had no instructions to dismantle the building, his orders being merely to get sufficient stone to keep the masons going. At the inquest Mr. Philip Baylis, deputy surveyor, of Dean Forest, said no one imagined that deceased would have pulled the building down when there was plenty of other stone more easily obtainable.

London County Council.—At last week's meeting of the Council a discussion arose on the recommendation of the Highways Committee relative to combined action by the Metropolitan authorities in regard to street upheavals. Mr. Emden moved as an amendment that the following words be inserted at the end of the recommendation: "And as to whether they are prepared to join in a conference to consider the question of a system of subways in London." This was agreed to. Mr. Emden maintained that they would never get their roads into a proper condition until subways were provided.—Replying to Mr. Burns, M.P., Mr. Waterlow said it was a fact that three blocks only of the houses on Reid's Brewery site were to be erected by the Works Department, and that the other three would be carried out by contractors. The Committee felt that it would afford some comparison between the methods of the Works Department and contractors.—A motion was passed referring to the Parks Committee and the Highway Committee the consideration of a proposal to provide kiosks, &c., on the Embankment.—A proposal to erect electrically-worked clocks in all the principal thoroughfares of the Metropolis was rejected.

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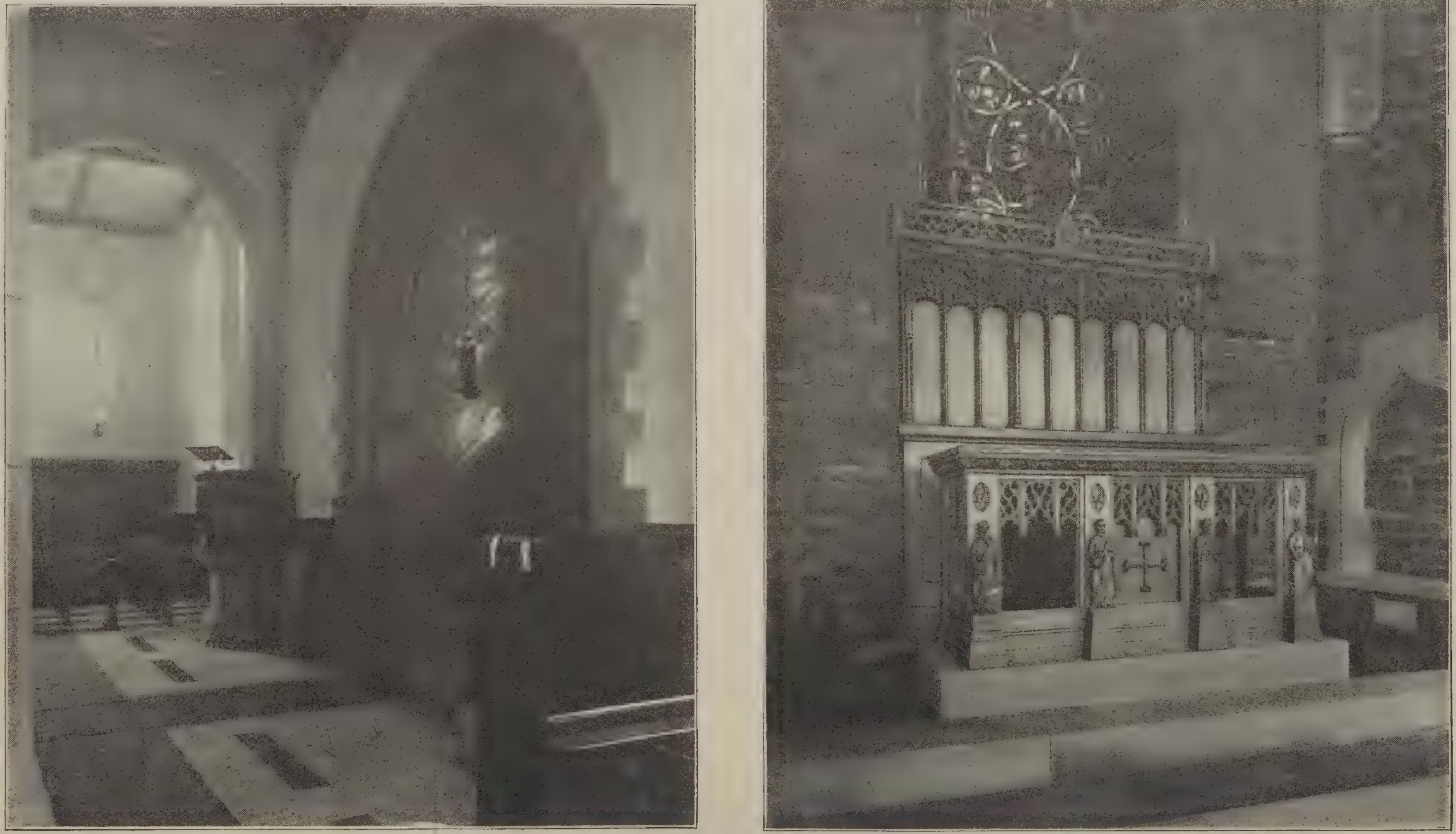

KILMUN PARISH CHURCH. P. MACGREGOR CHALMERS, Architect.

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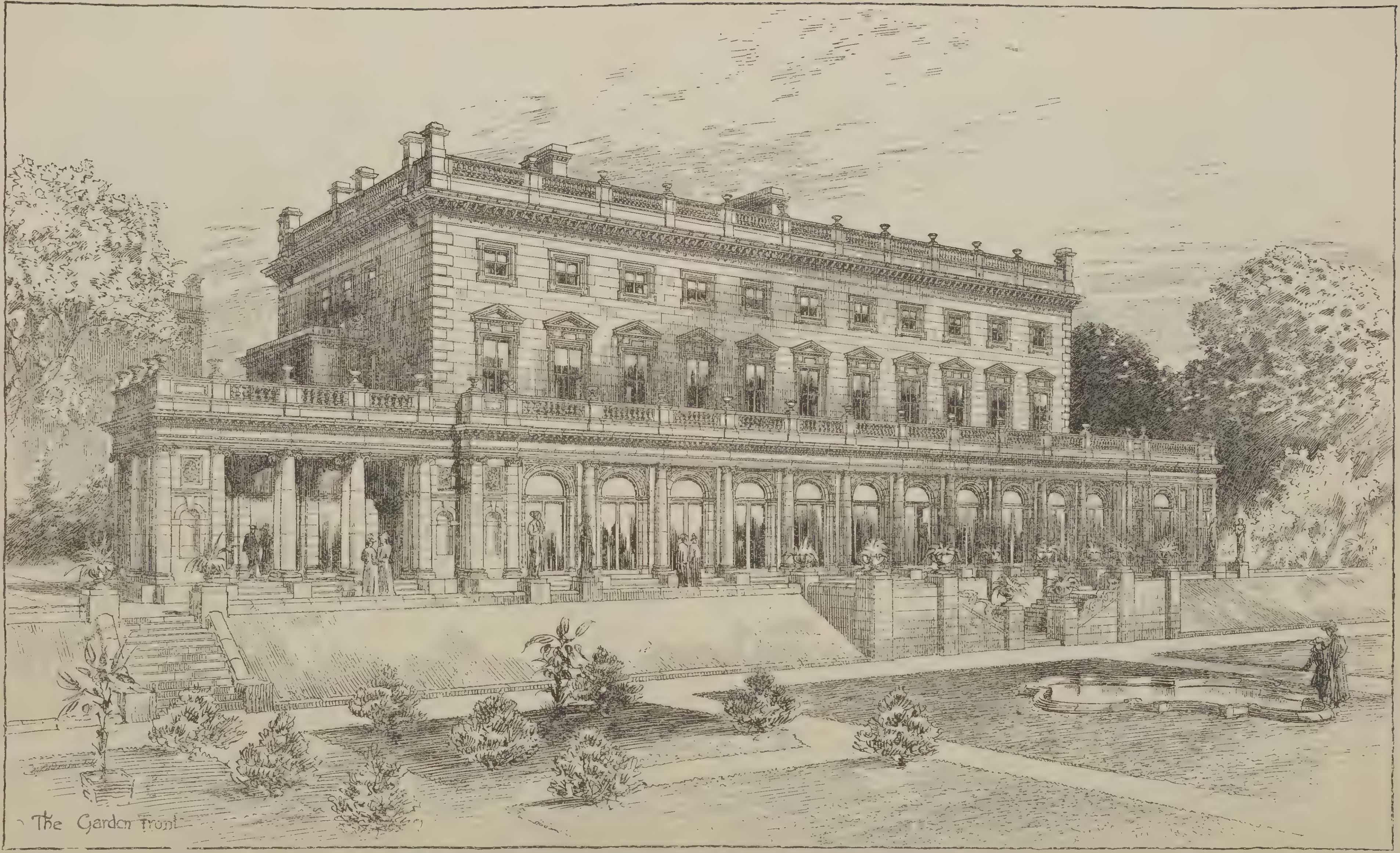
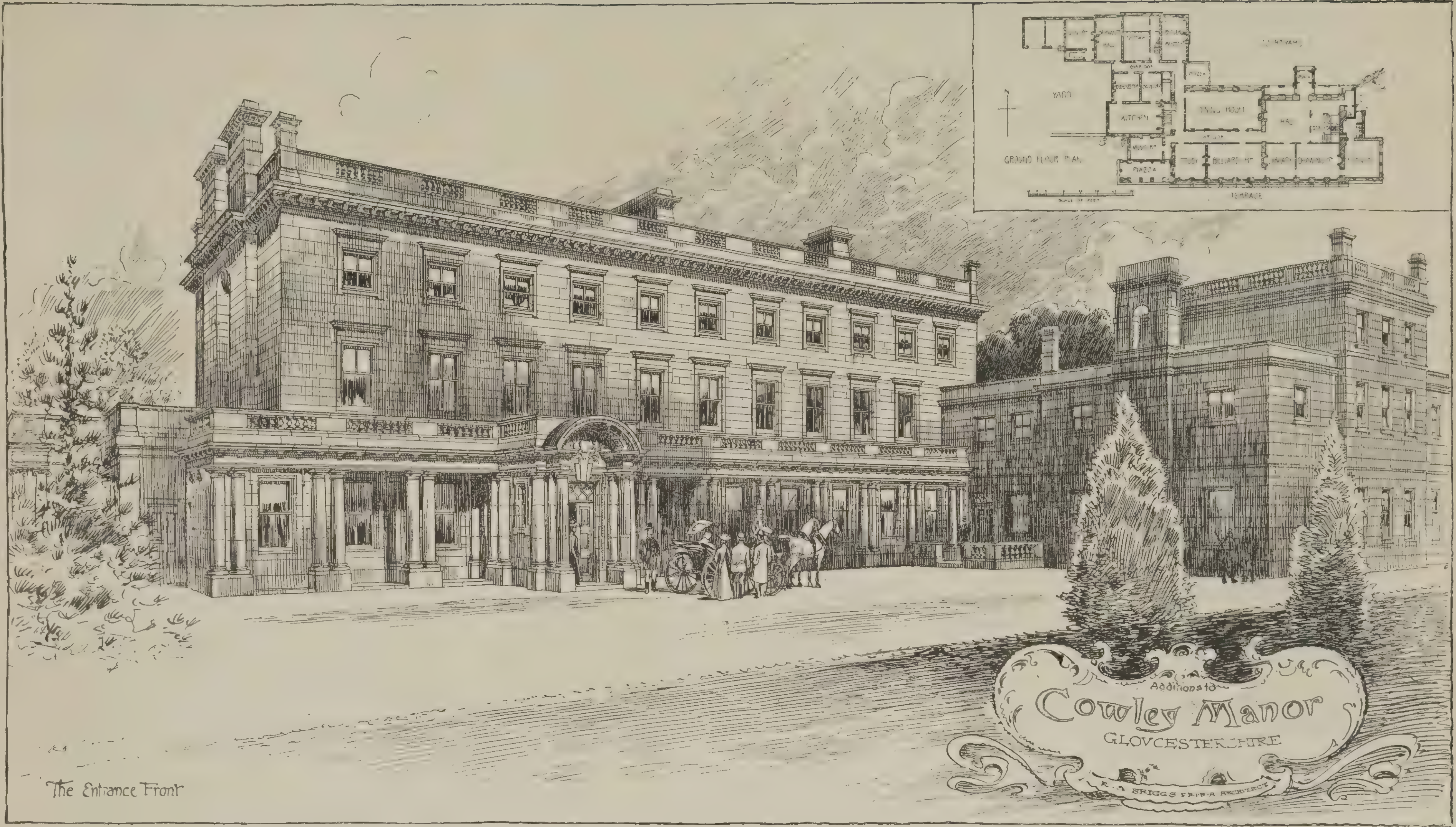


ADDITIONS TO COWLEY MANOR. R. A. Briggs, F.R.I.B.A., Architect.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, October 30th, 1901.



The Entrance Front

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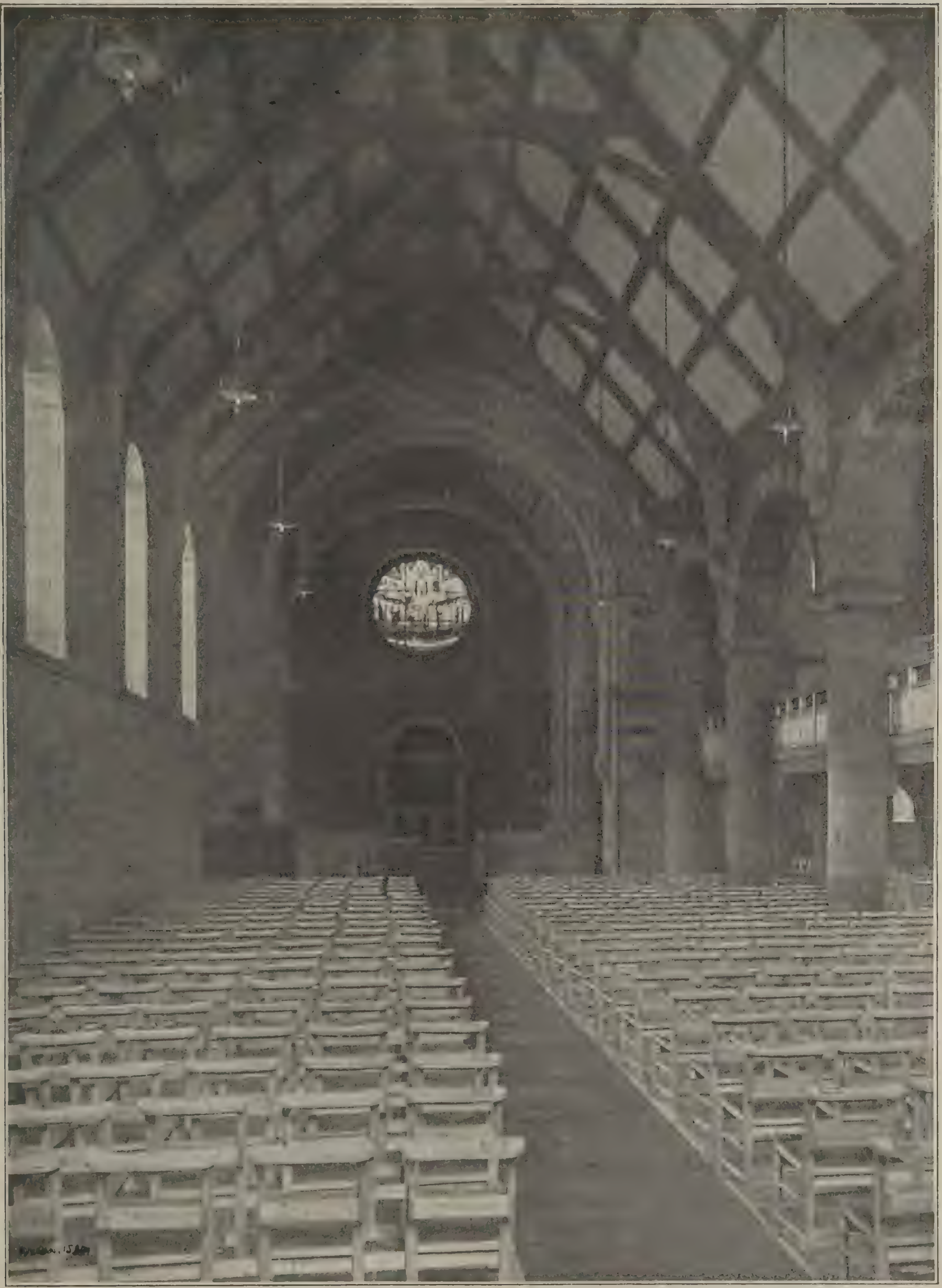

ST. KENNETH'S CHURCH, GOVAN, GLASGOW. P. MACGREGOR CHALMERS, Architect.

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Bricks and Mortar.

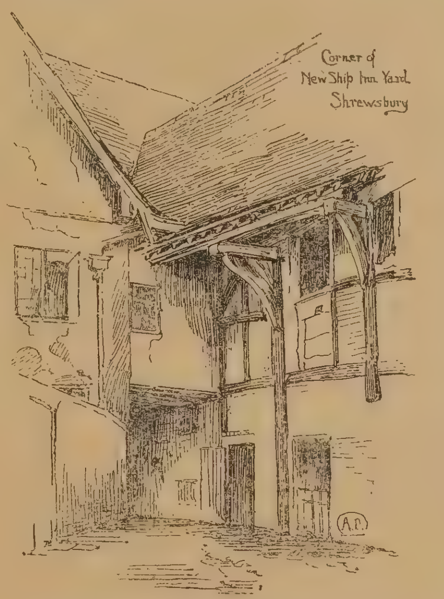
APHORISM FOR THE WEEK.

The art which is grand and yet simple is that which presupposes the greatest elevation both in artist and in public.—AMIEL.

Our Plates. THE illustrations given show the entrance and garden fronts of Cowley Manor, Gloucestershire, as they will appear when the extensive alterations and additions now in course of construction are completed. The small plan shows what these alterations and additions are—the walls which are hatched showing the existing work, and the walls which are in black showing the new work. It will therefore be seen that the new work is simply a continuation of the design of the old. The ashlar work is of Birdlip, and the dressings are of Hollington stone. The new dining- and billiard-rooms will have mahogany panelling, mantelpieces and doors, &c., and enriched ceilings. The general contractors are Messrs. J. Parnell & Son, of Rugby, and the architect, under whose superintendence the work is being carried out, is Mr. R. A. Briggs, F.R.I.B.A., of 12, Norfolk Street, Strand.

Cities of To-morrow. THE visit paid recently to Bournville by Lord Rosebery serves to call renewed attention to the results of the recent conference of the Garden City Association held in Birmingham. The extraordinary unanimity with which the resolutions submitted were passed, and the cordial sympathy which has since been expressed in the movement, are regarded by the promoters of the movement as so satisfactory that the executive has determined to lose no time in taking such provisional steps as are necessary to bring the Association's proposals to a definite issue. It is recognised that the provision of a suitable site is essential to the success of the enterprise, but expert advice is necessary in investigating the respective merits of various estates; and as for all purposes funds are required, an appeal is now being made for such, the result of which should prove satisfactory. There can be no doubt about the urgency of the question; and since it would be possible—as Dr. Mansfield Robinson, town clerk of Shoreditch, stated at the conference—for public bodies to assist in the development of an estate when acquired, the Committee of the Association have additional reason to push forward their proposals to a practical issue. The Association has been invited by the Coventry section of the Co-operative Union, Ltd., to hold a joint conference at Coventry on November 9th next, when Mr. Aneurin Williams, president of the Labour Association, will read a paper on the relation between co-operation and garden cities. This is the first conference arranged between the Garden City Association and the Co-operators, but in view of the interest which the latter are taking in the new scheme many other such meetings are likely to follow. The public interest which has been awakened in the Association's proposals is further indicated by the fact that there has been a considerable run on Mr. E. Howard's book "To-morrow," the first edition of 3,000 being now exhausted. Mr. Howard is now busy revising the MS. of a new edition, which will be issued in a few weeks, with some important additions, under the title of "Garden Cities of To-morrow."

Methley Church Restored. THE ancient parish church of Methley, which has been undergoing restoration, was reopened recently. The foundations have been underpinned throughout, the spire has been rebuilt on the original lines, the tower carefully repaired, the two western buttresses (which had cracked away from the building) have been rebuilt from the foundations, the west door has been opened out, the bells have been quarter-turned and hung on a new frame, and a lightning conductor fixed. The interior walls of tower, nave, aisle and chancel have been stripped of paint and the post-Reformation plaster; the stonework pointed; an ancient recess—for a holy water stoup—at the south door, another behind the pulpit, and the reveal of an ancient window in the north wall, showing traces of wall painting, have been uncovered; and recesses have been constructed in the walls for two ancient recumbent effigies. The ancient figure of St. Oswald, formerly over the south porch, which has suffered very seriously from the weather during recent years, has been built into the east wall of the church. The floor of the nave has been restored to its ancient level; a new floor of tiles and wood blocks, resting on a solid bed of cement-concrete, has been laid throughout the church; arrangements have been made for the inspection—by means of trap doors in the floor—of the ancient foundations discovered at the west end of the nave. The ancient font has been brought back from a hen-run, and its shaft from a mason's yard, and the font, canopy, lectern and pulpit restored. The ruinous "excrescence" against the north wall of the chancel has been removed, and a temporary vestry and organ chamber constructed. A permanent arcade on the north side of the chancel has been built. An ancient corbel, found during the work, has been built into the wall of the arcade. A new heating apparatus has been fixed, and the church is newly lighted throughout with the incandescent light. The cost will exceed £3,000. The restoration of the interior, and the erection of a new vestry and organ chamber—which is estimated to cost an additional £1,863—has yet to be carried out. Messrs. H. A. Prothero and G. H. Phillott, of London, are the architects.



Shrewsbury's Old Houses. SHREWSBURY is full of interesting buildings, but to find them out one must stay some time in the town. Hidden away amid the most unpromising slums are the remains of the old town mansions of the wealthy. For Shrewsbury in days gone by had its winter season of gaiety, to which the county squires brought their wives and families; and many are the houses now divided up which still bear the names of their proud owners, such as Ireland's Mansions, Rowley's Mansion, and many others. Fallen from their past grandeur, some have been turned into warehouses, others accommodate the poorest of the poor, whose children scramble up and down the old oak stairs. The yard of the "New Ship" inn is surrounded by buildings of this class, a jumble of brick, stone and half-timber dwellings. The sketch is by Mr. A. Durst.

Sheffield Society of Architects. THE annual dinner of the Sheffield Society of Architects and Surveyors was held recently. The chair was taken by Mr. Peter Marshall (president). Mr. Thomas Winder, in proposing "The Lord Mayor and Corporation," said it was gratifying to note how successful some of the Corporation's undertakings were proving. The tramways were showing a profit which bade fair to make Sheffield no longer the most highly rated city in the country. The waterworks this year showed a profit equal to three times the sum at which they were offered to the town in 1767. He was afraid that the popular cry for artisan dwellings had thrown all off the scent of the real and crying need of Sheffield, not for expensive dwellings for the highly-paid artisan, but for homes for the very poor, who were being evicted from crowded thoroughfares before other homes were provided for them. The Lord Mayor (Alderman J. Eaton) responded. Mr. E. Holmes, in proposing "The Royal Institute of British Architects and The Surveyors' Institution," spoke of the endeavours both were making to advance the position and recognition of the members by increasing the education of the younger members. This was responded to by Mr. J. Smith for the former and Mr. R. W. Fowler for the latter society. Mr. C. Hadfield proposed "The City and Trade of Sheffield," and Mr. A. R. Ellin (master-cutler) responded. Mr. A. W. Warner proposed "The Sheffield Society of Architects and Surveyors." He had received a report of the society, and found it was a very strong one, with 111 members. It had gone through a good year's work. It afforded excellent facilities for advancing its younger members, and protecting all members as far as possible against injustice, misappropriation of powers and the vagaries of Corporation committees. Mr. P. Marshall (president), in responding, also touched on the strength and educational work of the society. He said that arrangements had been made for lectures on November 4th by Mr. C. F. Brindley, on "Organ cases and organ chambers"; on December 12th, by Mr. A. Jeffery, on "Stained glass"; next year, on January 9th, by Mr. W. Watts, F.G.S., on "Concrete and its uses"; on February 14th, by Mr. C. Hadfield, F.R.I.B.A., on "True building"; and on March 14th, by Mr. T. G. Jackson, R.A.

Admiralty Works Department. SOME important changes have just been made in the Head Office Staff of the Admiralty Works Department. This Department is responsible for the design and construction of all engineering and architectural works at the naval establishments at home and abroad, as well as for their care and maintenance. These works include docks, wharves, slips, breakwaters, dredging, barracks, hospitals, magazines, stores, workshops, dwellings, drainage, lighting and water supply, &c. The care and management of Admiralty lands and property is also dealt with in this Department. The increase of the Fleet during recent years has necessitated a corresponding growth in the shore establishments, and this has involved a large increase in the staff of the Works Department. With the changes lately made the authorised permanent staff of the Department under the Director of Works is as follows: Two assistant directors of work, from £850 to £1,000 a year (with an addition of £200 a year to the senior). Engineering Staff.—Eleven superintending civil engineers, from £600 to £700 a year; twelve civil engineers, from £400 to £500 a year; twenty-two assistant civil engineers, first grade, from £300 to £400 a year; twenty-one assistant civil engineers, second grade, from £180 to £300 a year. Surveying Staff.—One chief surveyor, fram £800 to £1,000 a year; six surveyors, from £400 to £500 a year; ten assistant surveyors, first grade, from £250 to £350 a year; nine assistant surveyors, second grade, from £125 to £250 a year; one surveyor of lands, from £600 to £800 a year; one surveyor of coastguard buildings, from £500 to £700 a year; one clerk of works for ditto, from £215 to £300 a year. Many of these appointments carry in addition a house, London or Colonial allowance. Entries to the staff are made in the lowest grades—viz., assistant civil engineer, second grade, or assistant surveyor, second grade—by open competitive examination held by the Civil Service Commissioners. The limits of age at entry are twenty-three to twenty-eight for the assistant civil engineers, and twenty-three to thirty for the assistant surveyors. Promotions are made by selection as vacancies occur, through the successive grades up to senior assistant director of works and chief surveyor respectively. All officers of the staff are liable for duty either in London, at home stations or at stations abroad. Full particulars of the subjects and conditions of examination are obtainable at the Civil Service Commission, 68, Victoria Street, London, S.W., and notice of coming examinations are given by public advertisement. There are likely to be examinations for entry in both branches before long.

Keystones.

Etchings of Windsor Castle and Buckingham Palace by Mr. Hermann Haig have been accepted by his Majesty the King.

A New School at Craigellachie has been erected. Messrs. Brown & Watt, Aberdeen, were the architects.

Birmingham University's New Buildings will be commenced shortly. The Council of the University has authorised the preparation of plans for the necessary buildings estimated to cost £200,000.

The Largest Warehouse.—Liverpool has the the biggest warehouse in the world. It is built beside the docks, and is intended to house the imports of tobacco which form so important a part of Liverpool's trade. The warehouse is 725½ft. in length, 165ft. wide and 124ft. 10in. high. The ground area is 13,300 sq. yds. and the area of the several floors 174,098 sq. yds.

In the Chapel of the Hopital Cazin-Perrocheau of the Franciscan Sisters of Berch-Plage a number of frescoes of the Way of the Cross have been painted by Albert Besnard, and statues of the Virgin, St. Elizabeth, and St. Francis, executed by Madame Besnard. For some years this talented couple, actuated by sentiments of religion, humanity and gratitude for the deliverance from death of their son, have been associated in creating these monuments.

In honour of M. Bénard, the architect (of Compiègne, and former Grand Prix de Rome), and of the distinction he has gained in the international competition of architects for the design of the future University of California, M. Roti has produced an artistic *plaquette*. On one side of the souvenir is a profile portrait of Mme. Phœbe Hearst, the American millionaire and generous promoter of the scheme. On the reverse side are engraved portraits of the five members of the jury and a plan of the Californian University.

A Monument in Memory of the Emperor Frederic II. is proposed to be erected at Cologne. It appears that the project was taken up with enthusiasm, £6,520 were collected, and sculptors were invited to compete for the honour of executing the memorial. Finally Herr Albermann, a local artist of great merit, was selected to carry out the scheme. He was already setting about his work when the Emperor William objected to the design on the ground that his father was represented on foot. A new competition was arranged. Herr Albermann now submitted an equestrian figure, which was approved by the committee. Again the Emperor objected. His Majesty considered that a Berlin sculptor should have been charged with the task. The committee, on their side, thought that the Berlin artist should have submitted his claims in the ordinary course of the competition, but as argument is impossible in the circumstances they have tendered their resignation.

The Hall of the Cordwainers' Company, situated on the north side of Cannon Street, has during the last few months had extensive decorative works executed to it. The decorations of the large hall on the first floor, and the lower hall and court-room on the ground floor, were originally executed in the Adams style, but, beyond simple friezes, the walls and ceilings were left with plain surfaces. The lower hall and the court-room ceilings have now been decorated with Adams plasterwork, and have had a selected series of oval medallions fixed to the walls, thus breaking up their bareness underneath the enriched frieze which already existed. An Adams dado has been fixed in enriched material round the two rooms, and the whole of the rooms have been decorated throughout in a rich buff colour, relieved and picked out with gold. Both the new ceilings have also been gilded in their enriched portions. The ceilings have been supplied and fixed by Messrs. Jackson & Sons, of Rathbone Place, the painting and gilding works being executed by Messrs. Colls & Sons, of Coleman Street. The whole of the works have been designed and carried out under the personal directions of Mr. Howard Chatfeild Clarke of Bishopsgate Street Within, E.C., the company's surveyor.

The New Gaiety Theatre.—Mr. Henry Lovatt, builder, of Darlington Street, Wolverhampton, has obtained the contract for the re-building of the Gaiety Theatre, Strand, London. The cost will be about £50,000.

At the Launch of the Cruiser "King Alfred" at Barrow-in-Furness last Monday the committee of the recent King Alfred celebrations at Winchester was represented, at the invitation of the Admiralty, by Messrs. N. C. H. Nisbett, A.R.I.B.A., and H. A. White, hon. secretaries. The new vessel will be the largest and fastest cruiser in the world.

"Western Cornish Churches" formed the subject of a lecture by Mr. J. D. Enys, F.G.S., delivered to the Plymouth Institution last week. Many of their most interesting features and peculiarities, including ancient doorways, fonts, windows towers, crosses, rood screens, carved bench ends and frescos, and the remains of Norman work and the lack of chancel arch, and absence of clearstory and chancel, were referred to.

The restored Lady Chapel of St. David's Cathedral was dedicated last week by the bishop of the diocese. The ceiling of the Lady Chapel collapsed 130 years ago. The work of restoration has cost £2,500. The chapel had to be practically reconstructed, and the ante-chapel has also been paved and repaired according to plans by Mr. John Oldrid Scott, who succeeded his father, the late Sir Gilbert Scott, as the cathedral architect. Both chapels are attributed to Bishop David Martin (1290–1328), the fifty-ninth bishop in direct line from St. David.

Suicide of a Leeds Architect.—An inquest was held last week at the Black Swan Hotel, Harrogate, touching the death of George Alfred Thrustle (50), architect, who lodged at Westmoreland House, Harrogate, and was found dead in his rooms, with his throat cut, on Tuesday night last week. G H. Thrustle, traveller, of Leeds, son of the deceased, said his father had never been the same since his wife died five years ago, and he had also had financial troubles. Three months ago his father had a slight attack of rheumatic fever, through living in a damp house, at Leeds.

A Berwick Competition.—The Berwick School Board have selected the design submitted by Mr. J. Landell Nicholson and Mr. Frederick E. Dotchin, as joint architects, of Newcastle-upon-Tyne, for their new infants' school, caretaker's house, playsheds, &c. It was an open competition, and altogether thirty-one sets of plans were submitted. Mr. Nicholson was also successful eighteen months ago in obtaining, in open competition, the appointment for carrying out the erection of new schools at Kelvin Grove, Gateshead, for the Gateshead School Board, which give accommodation for 1,500 children.

A New Pupil Teachers' Centre at Coventry has been erected at the corner of Wheatley Street and Fairfax Street, of pressed bricks, terra-cotta dressings, with bands of granolithic stone occasionally. The building will accommodate about 120 pupils, and consists mainly of a hall, divided by a folding screen into two portions. There are two small classrooms. There is also a small room for the master, and of course cloakroom and other accommodation. The cost of the building has been about £2,100. Messrs. G. & I. Steane were the architects, and Mr. Charles Heywood was the builder.

The Liverpool Architectural Society met last week, when a paper on "Cheap Dwellings" was read by Mr. Fletcher T. Turton. He alluded to the recent conference on the subject of cheap dwellings at Glasgow, which he had attended, and said that the term "cheap dwellings" had a dual meaning—it might signify a dwelling let absolutely below its letting value; or it might be a house which was cheap in style. While in Liverpool they had been twitted with building too many two-roomed tenements, in Glasgow, out of 2,000 cheap houses, more than one quarter were only single rooms and more than half had only two apartments. In Liverpool there were some 800 tenements already built, and there were in erection, or about to be erected, some 800 more. They had found that a one-roomed tenement provided a considerable amount of necessary accommodation; Liverpool had done more towards housing the very poor than any other town or city in the United Kingdom.

The New Offices of the Gloucester Liberal Benefit Society in Barton Street, Gloucester, were opened recently. Mr. Harry B. Guest is the architect, and Messrs. Freeman & Jones were the contractors.

Society of Architects October Examination.—The following have passed the qualifying examination and are eligible to apply for membership: Arthur Lawrence Cox, of Folkestone, and Reginald G. Kirkly, of Sunderland.

A Statue of Oliver Cromwell at St. Ives, Hunts, was unveiled last week. It is erected in the Market Place, is of bronze and 8ft. in height, standing on an 8ft. pedestal of Portland stone. The base is of granite with four corner blocks surmounted by gas standards.

Newlands U.F. Church, Glasgow, is being erected at the corner of Langside Road and Riverside Road. The new church will have sitting accommodation for 800 persons. It is cruciform in plan, with nave, transepts, and choir recess. The style is fifteenth-century Gothic, the corner porch being so constructed that it can be continued into a tower at any future time if required. Large aisle arches, with octagonal freestone piers, will form a feature of the interior, while the roof timbers will be exposed so as to show an open timber hammer-beam roof. Giffnock stone will be employed for the exterior, and Auchenheath material for the inside stonework.

Improvements at Rhyl.—Mr. C. J. Richardson, architect, of Poulton, is preparing plans for the rebuilding of the property from the Queen's Hotel on the Rhyl Parade, to Sussex Street, on which it is intended to erect a magnificent arcade and ballroom, and ultimately reconstruct the Queen's Hotel. The arcade will have a frontage to the Promenade of 48ft. and to Sussex Street of 70ft., and its total length from the Promenade to Sussex Street will be 320ft. It will contain forty-one shops, varying in size. The pavilion or ballroom will be at the Sussex Street end of the arcade, and will have entrances from the promenade, the arcade, as well as a principal entrance from Sussex Street. A raised platform will surround the dancing floor, which will be laid on about 1,500 spiral springs. This floor will measure 95ft. by 55ft. Above the ballroom will be a large balcony, and a large stage will be erected.

The Memorial Stone of the New Municipal Buildings and Law Courts at Cardiff was laid last week by the Marquis of Bute. The buildings are to cost £233,000, and are being erected on the Cathays Park, a 60 acre tract, which was sold to the corporation by the late Marquis of Bute for £160,000, the vendor stipulating that none but municipal and educational buildings should find a place thereon. Sites have also been allocated for University College buildings, museum and art gallery, board school offices, technical schools and intermediate school for boys, and recreation ground, and there is likelihood of a very fine group of buildings being completed within a few years. The Cathays Park is contiguous to the castle, and therefore situate in the centre of the town, and with a liberal provision of broad avenues, lined by stately old trees, the approaches to the proposed public offices, municipal and educational, will afford picturesque accessibility.

Instability at Truro Cathedral.—The Truro Cathedral Building Committee reported to the Diocesan Conference last week that serious anxiety and painful disappointment had been caused by signs of fracture in eight of the Bath-stone bases of the nave piers. Investigation showed that there was nothing to indicate anything amiss with the foundations, or any settlement of the building, and the architect had reported that it was clearly a case of imperfect bedding. The committee added that the cracked stones could be replaced, if necessary, by a very costly and possibly dangerous process involving the underpinning of the arcades. But before undertaking so serious an operation they had decided, with the concurrence of the architect and contractor, to invite some thoroughly competent architectural expert to inspect the building and advise the committee thereon. The building committee has in hand a surplus of £2,871. A resolution was passed expressing a desire that the architect, Mr. J. L. Pearson, might pay more frequent visits to the cathedral.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Concrete under Buildings.

SHROPSHIRE.—CONCRETE writes: "I append by-laws relating to covering the surface of the ground under a domestic building with concrete, taken respectively from the 'rural' and 'urban' sanitary authorities of this district. I have three new buildings ready to commence, but the rural council will not pass the plans unless my clients will put in the concrete bed, in accordance with the by-laws. In all three cases the sites are perfectly dry; two are beds of pure red sand, and the other gravel to a depth of 8ft. or 9ft. It seems to me a most unreasonable stipulation, and I shall be glad to know whether the council can absolutely enforce it, or whether my clients would be wise in opposing it to the extent of proceeding with the work. The by-law of the rural sanitary authority is as follows: 'Every person who shall erect a new domestic building shall cause the whole ground surface or site of such building to be properly asphalted or covered with a layer of good cement-concrete, rammed solid, at least 6in. thick.' The by-law of the urban sanitary authority is as follows: 'Every person who shall erect a domestic building shall cause the whole ground surface or site of such building to be properly asphalted or covered with a layer of good cement-concrete, at least 6in. thick, whenever the dampness of the site renders such a precaution necessary.'"

It is considered that the council can enforce the provisions of the by-law, and it would be better to incur the slight extra expense of concreting over the area rather than contest the point. From a sanitary standpoint, it is undoubtedly desirable that the area of ground enclosed by a building intended for domestic occupation should be covered with a layer of concrete or other impervious material, so as to prevent any rising of ground-air or other vapours when the building is inhabited. T. E. C.

Load on Roof Trusses.

BRISTOL.—QUERIST writes: "Referring to the reply to 'D' on p. 78 of your issue for September 11th, is the practice of taking a vertical component of 56lbs. to the sq. ft. for roof covering, wind, &c., to be commended for all types of roofs? Is it adopted in general office practice, and would it include the weight of the truss in the case of a steel structure?"

A vertical component of ½ cwt. per sq. ft. of actual roof surface for the external and structural loads is generally sufficient to cover all contingencies for straight rafter roofs of ordinary construction and pitch, but for curved trusses it is necessary to take account of the horizontal action of the wind separately from the structural load. HENRY ADAMS.

Injunction for Damage to Adjoining Premises.

SOUTHEND-ON-SEA.—SCOTT writes: "The owner of some land has just built a factory. The adjoining owner has excavated a large hole to obtain sand. This hole is about 25ft. deep, and it is feared that the dredging for sand will cause a settlement in the factory, as the water-line is about 17ft. below the ground-line and consequently the sand must percolate from the owner's land into the adjoining owner's sand-pit. Can the owner obtain an injunction to prohibit the hole being made larger before any damage is done, or must he wait until damage is done and then sue for damages?"

You can obtain an injunction if you can prove that damage is being caused. If, however, the neighbouring owner is only pumping water from your land he cannot be stopped, as water flowing in unknown channels is the property of the finder.

Cement-Concrete Tank.

ALDERSHOT.—F. M. P. writes: "Is a cement-concrete wall of a tank 96ft. by 52ft., designed as per sketch (not reproduced), strong enough? The wall is to be 7ft. high, and will stand 1ft. above the ground on the outside and 1ft. above the water-level inside. (2) If the tank is to be divided lengthwise into two tanks 96ft. by 26ft., what should be the dimensions of the division wall?"

(1) Yes. (2) 3ft. thick.

Conversion of Concentrated into Equivalent Distributed Loads.

BRIGHTON.—STOCK SECTIONS writes: "Is there any method of reducing the load on an unsymmetrically-loaded girder to its equivalent as an evenly-distributed load, so as to enable a choice to be readily made from a maker's list, making use of the loads as indicated therein? I have to select a girder of 20ft. span to carry two loads of 6 tons and 8 tons, 5ft. and 13ft. respectively distant from the *same* end, in addition to a distributed load of 12 tons. How could the girder be selected having only the above-mentioned list as a guide?"

Referring to the accompanying illustration, let A B be the girder loaded as shown. The concentrated load can be converted into equivalent distributed loads (*i.e.*, loads to produce the same maximum stress) as follows:—

Reactions from concentrated loads,

$$\text{At A} = \frac{6(8+7)}{20} + \frac{8(7)}{20} = 7{\cdot}3 \text{ tons}$$

$$\text{B} = \frac{8(8+5)}{20} + \frac{6(5)}{20} = 6{\cdot}7 \text{ tons.}$$

$$6 + 8 = \text{total} \quad 14{\cdot}0 \text{ tons.}$$

Bending moments from concentrated loads,

Under the 6-ton load $= 7{\cdot}3\ (5) = 36{\cdot}5$ft. tons.

„ 8 „ $= 7{\cdot}3\ (5) = 8 - 6(8) = 46{\cdot}9$ tons.

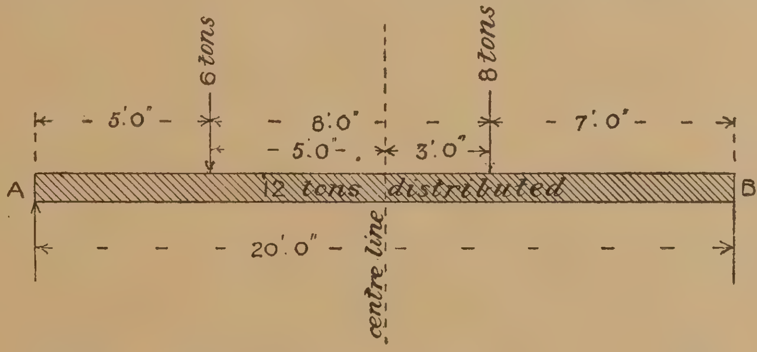
or, working the other way round as a check,

under the 6-ton load $= 6{\cdot}7\ (7+8) - 8(8) = 36{\cdot}5$ft. tons.

„ 8 „ $= 6{\cdot}7\ (7) = 46{\cdot}9$ft. tons.

and in the centre of span,

$$\tfrac{5}{8}\ (46{\cdot}9 - 36{\cdot}5) + 36{\cdot}5 = 43\text{ft. tons.}$$



CONVERSION OF CONCENTRATED INTO EQUIVALENT DISTRIBUTED LOADS.

Bending moment from distributed load,

$$\text{in centre} = \frac{\text{W}l}{8} = \frac{12 \times 20}{8} = 30\text{ft. tons.}$$

$$\text{or checked by leverage } \frac{12}{2}(10) - \frac{10}{20} \text{ of } 12\ (5) = 30\text{ft. tons.}$$

$$\text{and under 8-ton load} = \frac{12}{2}\ (7) - \frac{7}{20}(12)\frac{7}{2} = 27{\cdot}3\text{ft. tons.}$$

Total bending moment in centre $= 43 + 30 = 73$ft. tons.

„ „ under 8 ton load $= 46{\cdot}9 + 27{\cdot}3 = 74{\cdot}2$ft. tons

so that the greatest bending moment will occur under the 8-ton load, and it will be necessary now to find what uniformly distributed load would produce the same maximum bending moment.

$$\frac{\text{W}l}{8} = 74{\cdot}2, \text{ or } \frac{\text{W} \times 20}{8} = 74{\cdot}2,$$

$$\text{whence W} = \frac{74{\cdot}2 \times 8}{20} = 29{\cdot}68, \text{ say 30 tons.}$$

Referring to Dorman, Long & Co.'s catalogue, we find that a 16 × 6 × 62lbs. R.S.J. would be sufficient with a factor of safety of 3, or an 18 × 7 × 75lbs. R.S.J. with a factor of safety of 4. HENRY ADAMS.

Modern Schools of Art.

HULL.—STUDENT writes: "Where can I see the most up-to-date School of Art building?"

The new Liverpool School of Art, by Edward W. Mountford, is perhaps the most complete and most modern, but that at Bury (Woodhouse & Willoughby, architects) is a very good model.

Concrete Floor for Kitchen.

LIMERICK.—W. W. I. writes: "A kitchen on the first floor of a building is 28ft. by 12ft., and I propose to put in steel railway rails 4ft. apart crossways, and to erect a temporary staging or floor flush with the bottom of the rails, filling in with breeze-concrete 4½in. thick to the top, and tiling. In what proportion would you mix the concrete?"

We would not advise the rails being placed more than 3ft. apart. The concrete should be 6in. thick, thus getting a double bearing on bottom and top flanges. In other respects your method is the cheapest, and is satisfactory. The floor need not be bonded into the walls, as these will give the needed support along the sides, but at the ends corbels under the floor or short pieces of girders, railway metals, or T-irons, bonded the walls and concrete, might be used. The concrete would be best at 3 of sharp aggregate to 1 of cement. The staging or centering should remain up at least a week, and when removing it care should be taken not to jar and break the key of the floor.

Books of Villa Residences.

ST. IVES.—W. F. writes: "Can you mention a book or two of drawings of villa residences, showing elevations and rough plans?"

"Bungalows and Country Residences," by R. A. Briggs (10s. 6d.); "Country Homes" (15s. nett); "New Cottage Homes and Details," by Messrs. Palliser (15s.). These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Strength of Bath Stone Columns.

MALVERN.—X. Y. Z. writes: "I am about to erect a nave arcade in a chapel with gallery round. If Bath stone is used for columns of 18in. diameter, will it be strong enough? At 7ft. 3in. from the floor I want the columns to support the bearers for the gallery floor. Will it weaken them too much if they are let into the columns, and would it be advisable to put a different stone at this point? Should the square brick base under columns be calculated at twice the diameter of the column? If so, this would make the concrete base 6ft. sq. Is not this more than necessary?"

The crushing weight on Bath stone (Box Ground) is given in "Notes on Building Construction" Vol. III. as ·66 tons per sq. in. and Portland stone average 1·6 tons per sq. in. Portland stone in ashlar work is safe with a working load of 15 tons per sq. ft., therefore Bath would be safe with $15 \times \frac{{\cdot}66}{1{\cdot}6} =$ say 6 tons per sq. ft. reduced according to height of pier as follows:—

W = tons per ft. sup. as given above.

r = ratio of height to least diameter.

$$\text{Safe load on pier tons per sq. ft.} = \frac{24\text{W} - \text{W}r}{18}.$$

or it may be calculated by Gordon's formula. Letting bearers into the sides of a column or pier weakens it by the amount cut away and also produces a greatly increased stress if these side loads are not symmetrical, *i.e.* a load on one side balanced by an equal load on the other side. For the effect of non-axial loads on columns see "Designing Ironwork, 2nd Series, Part II.," pp. 34–39 (Spon, 2s. 6d.). If the base is brickwork in mortar, it should be covered by a stone large enough to reduce the pressure to 4 tons per sq. ft. and the footings should be such that with an extra width of 6in. all round the concrete may not press on the soil with more than 1½ tons per sq. ft. average; on hard gravel it may be double and on light soil half. HENRY ADAMS.

BUILDING CONSTRUCTION.

(*Continued from p.* 187 *of No.* 350.)

24 (*Additional Note*).—Referring to Fig. 22, let A B C D be a cross-sectional slice 1in. thick of a round pipe carrying water at *p* lbs. pressure per sq. in. Suppose the water to become solid, all except a small passage A C passing through the centre having parallel plane sides at right angles to the paper: the water in this space presses D and B apart with the force $2Rp$, but D and B are prevented from moving apart by the portions of hoop at A and C, and the pressure on one portion is, therefore, Rp as before. If we suppose an annular joint in the pipe, the force applied to it is the pressure on the section A B C D, that is πR^2, the circumference of the ring is $2\pi R$ ∴ the stress per linear inch is $\frac{p\pi R^2}{2\pi R} = \frac{Rp}{2}$. If the pipe has dead ends, it presents no difficulty to think of its being stressed longitudinally, but it takes some little effort of the imagination to become possessed of the idea as put above: either the pipe has what are equivalent to dead ends somewhere, and the water is statical, or we have to conceive the water taking hold of the pipe by its friction.

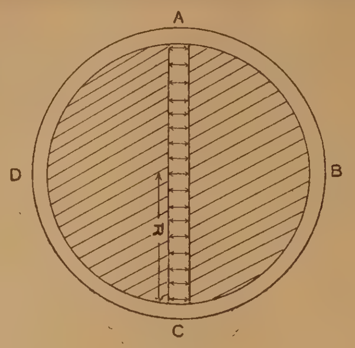


FIG. 22

25. I have intentionally separated my remarks in consideration of forces applied to a rigid body from the consideration of more than three forces applied to a point. I desire to impress the distinction upon the minds of students. The forces applied to a rigid body may be represented by the sides of a closed polygon taken in order, and yet they may not be in equilibrium; the rigid body is subjected to a couple, as a rule, in such a case. I have shown (paragraph 15) how to find the line of action of the balancing force when its amount has been found by means of a polygon. It is very desirable to have this operation impressed upon our minds as a distinct idea separate from the idea of forces balancing about a point. If a rigid body is fixed under a system of forces—forces equal and parallel to these forces will balance about a point; and, therefore, a system of forces equal and parallel, but of opposite courses, will balance about a point. I make use of this in paragraph 13 to explain "taking moments." Paragraph 8, Fig. 3, shows how to prove the triangle of forces experimentally; the polygon of forces follows from the triangle of forces. Suppose the forces (Fig. 23) a, b, c, d, e as balancing about O: by the triangle of forces *a* and *b* may be replaced by *f* and *d* and *e* by *g*, and the triangle *f g c* represents balancing forces.

If we know the directions of three forces which balance about a point, we know the angles (the species) of the triangle; and if we know the amount of one force, we know one side of the triangle, and we can therefore find the other two sides.

The principle of the polygon and triangle of forces enables us, by the solution of triangles, to determine forces or their directions from sufficient data. If we have given all the angles of any polygon and all its sides but two, we can determine those two sides. This is the most usual case we have to deal with. If we have given all the sides and all the angles but two, we can determine those two angles. It is well to remember these limitations.

It is my desire, whenever it is practicable, to use building illustrations. It may, however, be useful to consider the stress diagram of a wheel with spokes which can only bear tensile stress (Fig. 24). The wheel rests on the ground at A, and it has the spoke A O vertical. The rim is taken as being jointed at the ends of the spokes; for simplicity the weight of the wheel is neglected: the load equal to *a* is applied a to. Commencing with the triangle *a* 16 1, we get the forces at A, the spoke here offering no resistance to the force *a*: these forces at A are all thrusts or compressions. The triangle 1 *b* 2 is next drawn. Keeping the point B in sight, and taking the forces in the direction of the hands of a watch, and keeping also in view the lines on the diagram—bearing in mind that the lines of the diagram which have their courses towards the joint show compressions, while those from the joint show tensions—we find that 1 is a compression, *b* is a tension, and 2 is a compression. There is some little difficulty with beginners in getting into the habit of going round the joint in this way and settling the nature of the stresses: the line 1 is marked with two arrow-heads, because we take it in one triangle in one direction and in the other

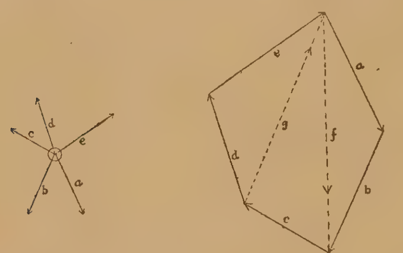


FIG. 23

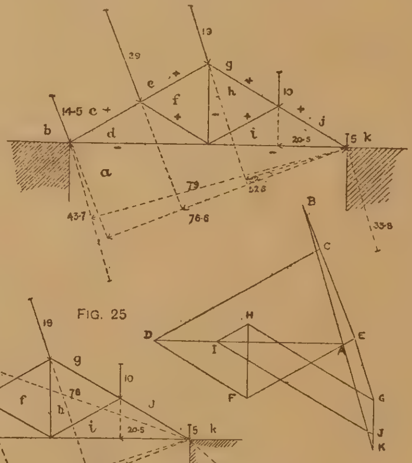


FIG. 25

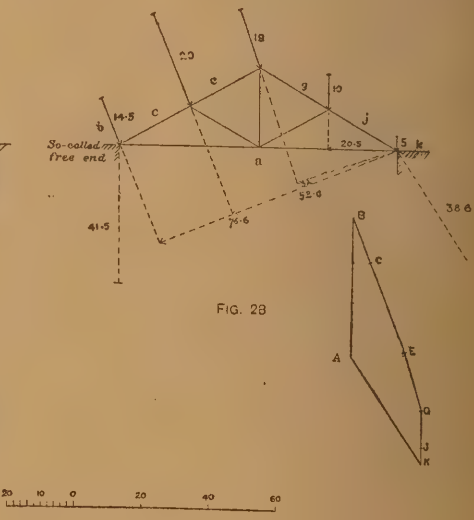


FIG. 28

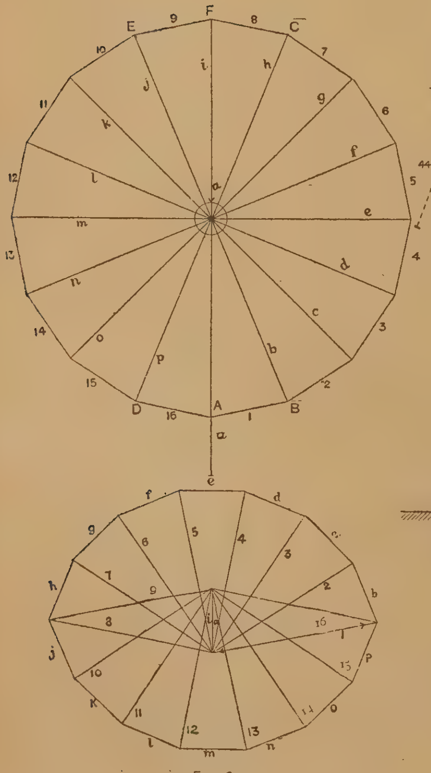


FIG 24

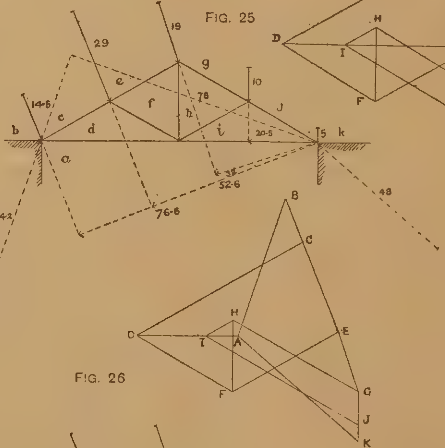


FIG. 26

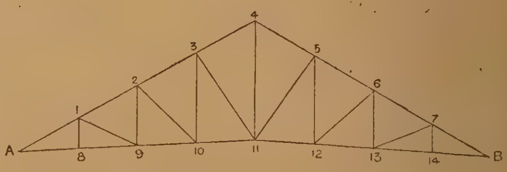


FIG. 29

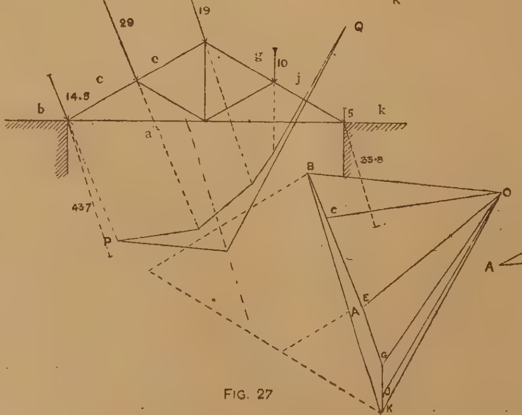


FIG. 27

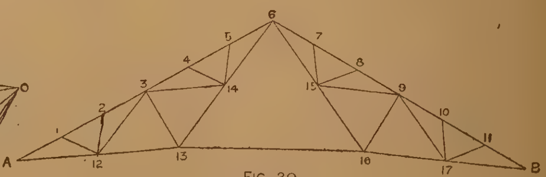


FIG. 30

triangle in the opposite direction. We proceed with the various joints in this way till we reach C. We have here to consider the load *a* applied in the direction *i* at O. Before dealing with this, we had better return to the joint D, and come round the other way till we reach E; and now we find that we have a closed polygon for the forces (all pulls) acting upon O. But we have supposed an external vertical force equal to *a* to act at O—where does this force appear on the diagram? Let us consider the joint F.

We have the stresses 8 and 9, and it is necessary to have a force equal to *a* applied at F to complete the triangle. This force is supplied by a tension in *i* equal to *a*, and this is exactly supplied by the applied force at O.

An inspection of the diagram will show that the stresses in the spokes are all equal, and they are each equal to *a*. It will also be seen that increasing the number of spokes and at the same time increasing the number of joints weakens the wheel by increasing the stress upon each element of the rim.

If we take (as in the case of the hind wheel of a bicycle) the load *a* to be $\frac{1}{10}$ ton, allowing a sufficient factor of safety for a structure of this kind, the spokes would need to be $\frac{1}{4}$in. in diameter, and this is much greater than we have them in common bicycles; but in common bicycles the rim is not jointed and this makes all the difference. In working stress diagrams we frequently deal with parts which are not joints as if they were joints. Again, in most cases we deal with our loads as if they were a series of weights without mutual reactions and as having no self-supporting value; but, as a rule, structural loads have self-supporting value or may be arranged to have it, and this should be properly taken account of in the design.

Let it be repeated, the student will get very little good by copying diagrams from books of them or from cards specially prepared as lessons. It may be useful to a draughtsman, whose every-day business it is to draw stress diagrams, to see how similar forms have been treated by other men, and he may have examples to consult; but the most useful course for the student is to keep to one or more simple forms and master the habit of drawing diagrams for these. If the student can draw the diagram asked for in question 45, South Kensington Subject III. papers, this year, he should be able to draw any other diagram of a roof truss that may be required. It should be the business of the student to economise his memory; many a good brain is injured by being filled up with a disorderly lumber of formulæ and diagrams. Let students who think they have "bad memories" take heart; the mental exercise occasioned to some men by their want of easy memory is the very best thing they could be busy about.

26. Fig. 25 shows the method of taking moments about the right-hand point of support. We find the lengths of the perpendiculars upon the forces to be as marked: we draw the polygon B, C, E, G, J, K as if the forces surrounded a point, and we find the balancing force as B K, giving its amount and direction.

We now settle that we shall decompose this balancing force as two parallel forces whose points of application to the rigid body shall be at the points of support. We draw the dotted line at the left point of support parallel to B K.

$$\begin{array}{llcr} 10 & \times\ 20{\cdot}5 & = & 205 \\ 19 & \times\ 32 & = & 608 \\ 29 & \times\ 52{\cdot}6 & = & 1525{\cdot}4 \\ 14{\cdot}5 & \times\ 76{\cdot}6 & = & 1110\ 7 \\ \hline & & & 3449{\cdot}1 \end{array}$$

Divide this sum of moments by 79, and the quotient is 43·7, which amount is represented by the line B A, and it is the reaction of the left-hand wall; the remainder, A K, is the reaction of the right-hand wall.

Let us now, once for all, go round the joints of this truss to find the stresses. Commencing at the left-hand point of support, we mark the spaces between the lines of action of the forces by letters *a*, *b*, *c*, *d*; we go round the joint in the direction of the hand of a watch, keeping our eyes on the truss and the stress diagram at the same time; we proceed from A to B, and we begin with the known force A B, which is already drawn; and now we draw B C, also already drawn; and now we draw C D parallel to the rafter of the truss; we know the polygon must close with D A, and consequently this line parallel to the tie of the truss finds for us the point D. We have now to determine whether these stresses are compressions or tensions; A B is a thrust *against* the joint, a compression; B C is also *towards* the joint, a compression; C D is again *towards* the joint, a compression; but D A is *from* the joint, and it is, therefore, a tension. Beginners have difficulty in seeing these "*from* the joint" and "*to* the joint" stresses, but the work is worth a small exercise of patience. I have no difficulty whatever, looking at the two figures—the diagram and the truss—in feeling that when I name the letters D A on the diagram that I am moving in a sense "from the joint" on the truss. Next take the joint *d*, *c*, *e*, *f*. We already have D C; C E is 29. From E we draw E F parallel to the rafter, and we find the point F by drawing D F parallel to the strut. Now, if we attempted to draw the polygon for the joint at the bottom of the king rod we should find that we had not sufficient data. We know A D, and we know D F, and we have the directions of the other forces. But there are *three* forces to be determined, and we can only determine *two*; we must therefore take the joint at the open first, so we begin with F E, next E G. We then draw G H parallel to the rafter, and a vertical line from F finds us the point H; knowing F H, we can now draw the polygon for the bottom of the king rod: A D tension, D F compression, F H tension, H I compression and I A tension. The polygon for the next joint *i*, *h*, *g*, *j*, tests the accuracy of our work; because the side J I of the polygon, being the only one to be determined in amount, must satisfy double conditions; that is, its amount must equal the distance I J, and besides, the line I J must be parallel to the rafter of the truss—this we find to be quite so. Finally the polygon A I, I J, J K, K A represents the forces about the right-hand point of support.

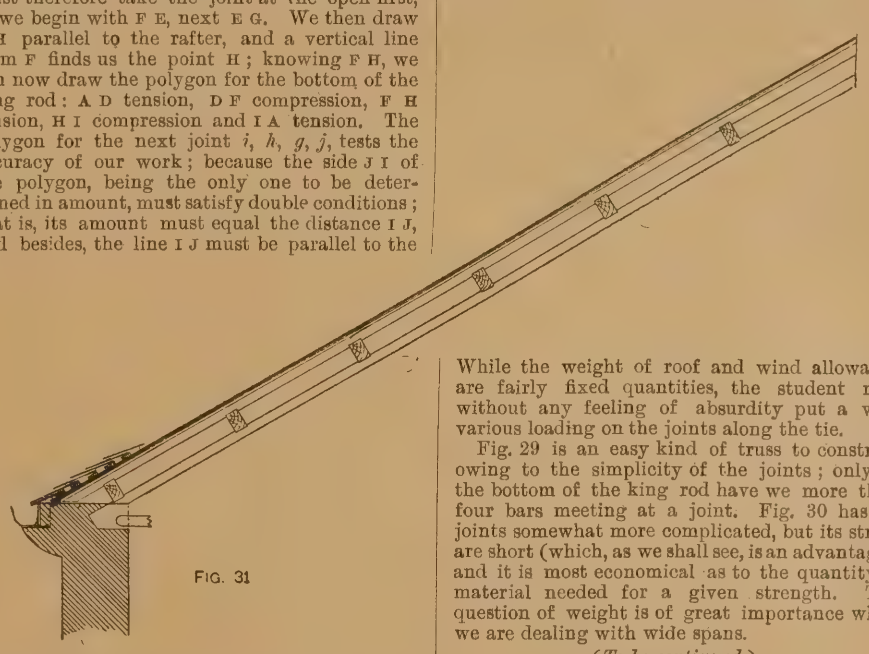


FIG. 31

Referring to Fig. 26, it is frequently assumed that the truss may be fixed at one end, and that in such a case the reaction at the other end will be vertical. I see no particular advantage in this way of treating the question. The behaviour of large trusses resting on stirrups or roller bearings, to provide for expansion by increase of temperature, is a subject to be taken account of; if the truss is fixed at one end, and on roller bearings at the other, the rollers would require to be frictionless to give an absolutely vertical pressure on the wall. This subject may be reverted to again; but if this question of variable reaction is to be dealt with, it is better to take the general case. The truss may be maintained in equilibrium in infinite ways by reactions at its ends; if we assume any particular direction at one end we shall have a consequent direction at the other end; in Fig. 26 the direction at the left-hand end is assumed as shown, the sum of the moments of the applied forces is divided by the length of the perpendicular from the right-hand end, and the quotient is the value of this left-hand reaction; it is A B; the stress diagram is drawn as shown in the figure, and we get A K as the direction and value of the right-hand reaction.

Fig. 27 shows the usual way of getting the balancing force on the truss, considered as a rigid body. The point O has been chosen in such a position as to show in a marked manner that the point A cannot be found by drawing a line through O parallel to a line joining P and Q. This is a very common mistake which students make. In the case of where the loads on the truss are all vertical, the point is found by drawing a line from O parallel to P Q. I leave it to students to discover for themselves why it is not so in the general case. In the figure A is found by dividing B K, so that the parts are proportional to the parts into which the direction of the balancing force divided the tie of the truss.

Fig. 28 shows the truss with the reaction at the left hand end vertical.

Figs. 29 and 30 show usual forms of truss for wide spans; and Fig. 31 is to show how the weight of the roof comes upon the truss. The student is advised to draw stress diagrams of these trusses with various loads, not fantastic loads. Besides the weight of the roof, trusses will have to carry the weights of ceilings; and in some cases very considerable weights may be conveniently suspended from trusses so as to free the ground floor from pillars in inconvenient places, &c. Much more of this kind of construction might be carried out than is done, particularly in connection with shops, where wide free windows and spaces are desirable. While the weight of roof and wind allowance are fairly fixed quantities, the student may without any feeling of absurdity put a very various loading on the joints along the tie.

Fig. 29 is an easy kind of truss to construct owing to the simplicity of the joints; only at the bottom of the king rod have we more than four bars meeting at a joint. Fig. 30 has its joints somewhat more complicated, but its struts are short (which, as we shall see, is an advantage), and it is most economical as to the quantity of material needed for a given strength. The question of weight is of great importance when we are dealing with wide spans.

(*To be continued.*)

ASSOCIATION OF MUNICIPAL CORPORATIONS.

THE autumn meeting of this Association was held last week at the Westminster Palace Hotel, Sir A. K. Rollitt, M.P., the president, in the chair. The town clerk of Wolverhampton moved a resolution asking the president of the Local Government Board to receive a deputation from the Association on the subject of lessening the cost and inconvenience incurred in the promotion of private Bills, and the consolidation and amendment of the laws relating to public health. A certain Dublin Bill cost £40,000 to carry through Parliament, a district with a ratable value of £40,000 had to spend £10,000 on a drainage Bill, while on another occasion £60,000 was spent to promote a water Bill. At the close of a long discussion it was left to the Association to devise the best course to be pursued. The Mayor of Plymouth moved a resolution urging the Local Government Board to bring its practice into harmony with that of the Home Office by granting the full term of sixty years for the repayment of loans for workmen's dwellings. In Plymouth they spent £83,000 in clearing sites and putting up buildings, but owing to the restrictions of the Local Government Board they had rather intensified the evil they meant to deal with. They wanted to provide for labourers earning from 15s. to 18s. a week, and their families. They had to acquire a number of overcrowded areas, and then the buildings they were able to put up provided for such people a suit of rooms for which they would have to pay 4s. 6d. a week, which was utterly beyond their means. The resolution was unanimously passed.

PROFESSOR BLYTH ON VENTILATION.

THE annual general meeting of the council and members of the Incorporated Society of Medical Officers of Health was held on Friday last in the Richelieu Salon of the Hotel Cecil.

Professor A. Wynter Blyth (who is the medical officer of health for Marylebone) in his presidential address dealt with the subject of "Ventilation." In these days it had come, he said, as a revelation and surprise to many that not a drug in the Pharmacopœia, not an animal extract, not one physical appliance with which science had enriched the remedial art, neither singly nor collectively, was equalled in the treatment of tubercle to bathing the lungs and skin in the fresh air of heaven. There were two distinct advances in the theory and practice of ventilation which had been recently made; the one was the publication by the Sanitary Institute of the Report by the Cowl Committee; the other the wide distribution of electric energy, permitting such mechanical appliances as rotating fans to be utilised by ordinary householders. Wherever there was an electric supply, mechanical ventilation was cheap and practicable. Speaking of the ventilation on the Central London Railway, and of certain experiments that had been made, the president said that, taking the whole results, they showed that, so far as respiratory impurity went, the Tube Railway gave better results than the Underground Railway, and better results than in ordinary places of assembly. Even in a crowded lift the sojourn was too short to seriously contaminate the air, and since each lift when it ascended to the level of the street had the advantage of thorough ventilation, the transient contamination of air during the sojourn was swept away. As to the ventilation of sewers, he had the utmost confidence that the problem was capable of solution by a suitable arrangement of fans driven by electric or other power. The best method of ventilating an ordinary room was a good warm air-grate, with an electric fan, which could be arranged so as to draw the air more rapidly from the back of the grate. With regard to the ordinary tenement house, it was hopeless to suggest any mechanical appliance. The essential thing was to see that the passages and staircases were well ventilated. It was when the house was shut up at night that the great harm from bad air was caused. It was erroneous, on the other hand, to condemn a place as unfit for work or habitation because it was underground, inasmuch as it was within the possibilities of modern science to make the deepest mine not only habitable, but agreeable and healthy. Not a single artisan's dwelling was ventilated by mechanical means. It might be hereafter a contribution to the solution of the housing question to build downwards in the depths, instead of upwards on the mountain. It was far better to work in a room with the window wide open than to have a ventilator. With the growing price of land in our cities, the increasing cost of building materials, and the increasing severity of building by-laws, there did not seem the smallest possibility that the cubic space per head would be increased; consequently, they were bound to consider seriously the question of mechanical ventilation, and to welcome every step which cheapened the delivery of pure air by the aid of motive power. If only there was a large demand by the public for mechanical ventilating appliances, the market would be flooded with such appliances, which could be obtained and maintained at a cheap cost.

In a discussion which followed, Dr. Gwynne (the late medical officer of health for Hampstead) declared that a fortune awaited the discoverer of some automatic means of ventilation. Subsequently the members dined together in the same building under the presidency of Professor Blyth.

Law Cases.

Dangerous Acids in Sewers.—Messrs. Cresswell Brothers & Schmitz, of Red Lion Square, appeared last week before Mr. Marsham at Bow Street to three summonses charging them with allowing chemicals or manufacturing refuse to flow into a public sewer. Mr. Dumas stated that the proceedings were taken under the London County Council (General Powers) Act of 1894, the object of which was to prevent the discharge of offensive or injurious matter into sewers, the penalty being £20 for the first offence and £5 for each day on which it was repeated after conviction. The defendants were sponge bleachers in Red Lion Square. For a long time past strong sulphuric fumes had been noticed in the main sewer in that neighbourhood. Indeed, they had been noticed half a mile away. Some of the men employed in the sewers were quite overcome by the fumes. At last, after a great deal of trouble, the nuisance was traced to the defendants' premises. Samples were taken. One contained 201 grains per gallon of sulphurous acid. Other samples contained 318 and 295 grains of sulphurous acid per gallon, and these, of course, were dangerous quantities. Some of the bricks in the sewer in the neighbourhood of the defendants' premises were eaten away by the acid. If the defendants had treated the chemicals with lime or soda, they would have been rendered perfectly harmless. Mr. Hale, for the defence, said that the defendants had been engaged in business for thirty years, and they felt that they ought to have received some warning before these summonses were issued. Mr. Marsham said the local authority was not bound to provide sewers for carrying away dangerous acids. The action of the defendants might have caused great suffering to the men who had to work in the sewers, and they would be fined £5 on each summons and £10 10s. costs, £25 10s. in all.

Bricklaying as an Excitant.—A merry-looking old Irishman named Murphy appeared before Mr. Plowden at the Marylebone Police Court last week, and in reply to a charge of being drunk and disorderly said the only excuse he could offer was that he got the chance of getting some work the previous day, and that made him excited. Mr. Plowden: "I am curious to know what that work is." Prisoner: "Brickwork, your lordship. From my childhood I have laid bricks." "And you are so fond of it that the mere thought of it makes you get drunk! Have you got a job?" "I have the prospects of one." "That looks as if you are going to get drunk again." "Oh no, I'll watch it, your lordship." "Well, I won't stand between you and the fruition of your dearest hopes. Go and lay bricks as fast as you can."

CASKET IN IVORY, EBONY AND PEARL, BY J. PAUL COOPER, ARCHITECT.

A Bristol Arbitration Case.—Mr. H. R. Withycombe, the arbitrator in the dispute between Messrs. A. Krauss & Son, contractors, and the Corporation of Bristol with reference to the contract for enlarging the City Lunatic Asylum, has made his award. The evidence was taken about two months ago. Messrs. Krauss & Son claimed a sum of £4,737 on the ground that the Corporation had, as they alleged, delayed the execution of their contract by the non-delivery of goods which they undertook to supply themselves. The date of the contract was October, 1897, and the total amount was £36,927. The claim was made up as follows: Increased cost of labour £822, increased cost of supervision £569, increased establishment charges £502, increased use and depreciation of plant £336, loss of interest on capital locked up in the undertaking £395, and loss of profit on work which might have been done elsewhere if Messrs. Krauss & Son had not been detained on this particular work. We understand that the arbitrator has ordered the Corporation to pay Messrs. Krauss £120 in respect of their claim; and as the amount awarded is less than the formal offer made by the Corporation before the arbitration, Mr. Withycombe has directed that the costs of the arbitration and reference shall be paid by the claimants.

New Companies.

Cookstown Lime Co., Ltd.

Registered for the purpose of acquiring from the Cookstown Gas and Light Company certain plots of land, quarry limekilns, buildings and premises, and to carry on the business of lime-burners and manufacturers. Capital £1,200, divided into £1 shares. The first directors are the Rev. Hamilton Brown Wilson, James Dickson Anderson, John Thompson and Thomas Wallis, all of Cookstown. Registered office: Molesworth Street, Cookstown, co. Tyrone.

High Field Estate Co., Ltd.

Registered to acquire any lands, buildings or other hereditaments in the counties of Durham or Northumberland, or elsewhere, or any interest therein; to purchase a plot of land near Felling, in the county of Durham; and to carry on the business of estate owners and managers, quarry owners, builders, contractors, decorators, carpenters, joiners, cabinet makers, plumbers, engineers, brick, tile, pipe, stone, sand, cement, lime, hardware and timber merchants, &c. Capital £16,000 in £1 shares. Registered office: 60, King Street, South Shields, Durham.

East Barry Land Syndicate, Ltd.

Registered to erect dwelling-houses, villa residences, cottage-dwellings, shops, warehouses and other buildings in the counties of Glamorgan and Monmouth or elsewhere; as builders and contractors; to deal in and with any freehold and leasehold ground rents. Capital £5,000 in £5 shares. The first directors are A. Richards, A. Jackson and J. Roberts. Registered office: Metropolitan Bank Buildings, Barry, Glamorganshire.

F. J. Martin & Worthington, Ltd.

Registered to acquire the business carried on by G. A. Worthington at St. James' Road and Albert Road, Southsea, Hampshire, and to carry on the business of oil and colour merchants, manufacturers and factors of and dealers in varnish, japan, paints, oils, colour, turpentine, lead glass, plumbing goods, wallpapers and brushes, &c. Capital £7,500 in £1 shares. The first directors are G. A. Worthington (chairman) and Mrs. A. M. Worthington. Registered office: 51 and 53, St. James' Road, Southsea.

The Casket in ivory, ebony and pearl illustrated on the previous page was made by Mr. J. Paul Cooper, the eminent architect, of Aubrey Walk, Camden Hill, Kensington, W., whose craftwork is well-known at the Royal Academy and the Arts and Crafts Exhibitions. Many of our younger architects are now able craftsmen, and they undoubtedly derive much good from this study in branches of constructive design.

New Patents.

These patents are open to opposition until December 2nd.

1900.—Water-Closets.—16,896. J. G. Davidson, East Church Manse, and J. Don, 53, King Street; both of Peterhead, N.B. Instead of pulling a cord, the cistern is discharged by pressing an electric button. This causes an electro-magnet to release a tipper, or, in another type, lifts the cap of the syphon and so effects the discharge. In both cases the parts automatically readjust themselves after the flush has taken place.

Tile Presses.—17,132. R. Stanley, Manor Court, Nuneaton. This invention relates to a press having a number of small plungers fitted to one head, in combination with a corresponding series of die-boxes. The tiles are pressed endways, which enables sharper and harder arrises to be obtained; moreover, the tiles are given a perfectly smooth face. Little or no more power is required than for pressing a single tile.

Goods Conveyors.—20,290. W. H. Aston, 46, Eagle Wharf Road, London, N. A spiral framework is arranged between the floors, and is fitted with a moving track, consisting of a number of treads attached to an endless chain. On this track the goods are placed, there being also a spiral for bringing them down from the upper floors to the lower ones.

Road Scarifiers.—20,291. T. Musto and G. Musto, East London Iron Works, Bancroft Road; and J. Jones, Bruton Works, Bruton Place, Commercial Road, London, E. On a suitable carriage are mounted a steam or gas engine and a frame carrying a number of pointed steel bars. After these bars have been driven into the ground by a monkey, the machine is made to travel forwards so as to break up the ground. The invention is chiefly intended for use in connection with wood-paving.

Public Washhouses.—20,674. D. K. Tullis, Kilbowie, Dumbarton. The object of this invention is to remove the steam and vapour so common to public washhouses. The steam in the coppers is taken off by an overhead pipe running from one end of the building to the other, communicating with an induction pipe which conveys sufficient hot air to rapidly condense the steam so that it can be suitably discharged. Hot air is also employed for drying the clothes on the horses.

Refractory Materials.—21,496. R. J. Friswell and The British Uralite Co., Ltd.; both of 37, Lombard Street, London, E.C. Articles saturated with silicate of soda are exposed to the action of carbonic acid gas in a closed chamber, the sodium carbonate and bicarbonate so produced being subsequently removed by washing.

1901.—Square for Determining Slopes and Batters.—937. M. S. Excell, 1, Honiton Road, Kilburn, London, N.W. This invention is intended to facilitate the drawing of slopes or batters such as are needed in sea walls, roofs, embankments, &c. It consists of a piece of celluloid, brass, pearwood or other suitable material about 12in. square and $\frac{1}{16}$in. thick. A number of slits are formed in it corresponding to certain batters, through which slits a pencil point is passed for the line to be drawn.

Doors.—5,370. E. J. Goodwin, 4, Beacon-close Terrace, New Brompton, Kent. A small metal roller resting on a plate is let into the lower corner of the door in order to prevent "hanging."

Foundations in Water-Logged Ground.—16,721. N. Schietkiewicz, St. Petersburg. The water is withdrawn by pressure pipes, and liquid cement is then forced in to form a solid foundation.

The following specifications were published on Saturday last, and are open to opposition until December 9th. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

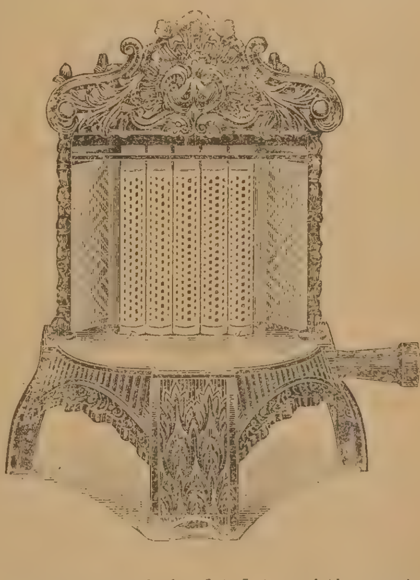
1900.—16,787, Young, locks. 17,685, Gaines, apparatus for printing upon tiles, glass, &c. 17,734, Crossley & Atkinson, purifying gas and heating and moistening air. 17,762, Lane, manufacture of gas. 19 264 Cameron, Commin & Martin, sewage works. 20,073, Smith, purifying acetylene and other gases. 21,047, Young, lock staples and locks. 21,243, Rössler, dust-destroying apparatus. 21,692, J. Duckett & Son, Ltd., & Bullock, urinals. 21,765, Beards, locks and latches. 22,105, Hobman, street-paving.

1901.—2,766, Gossweiler, acetylene generators. 3,629, Farnsworth, jacks for lifting purposes. 9,262, Hansel, machine for making dovetails. 9,481, Murphy, pressure tanks. 10,437, Eguia & Bourrelly, gas burners. 11,747, Gulland, stand pipes. 12,074, Goether & Wetzel, street sand bins. 12,900, Diehl, dampers for stove pipes, &c. 12,956, Trocquenet, incandescent gas burners. 15,214, Kreft, digesters for the manufacture of artificial stone. 15,584, Frank, valves and cocks. 16,099, Boult (*Granjon & Isnard*), gas burners. 16,184, Crombie, pipe couplings. 16,614, McIsaac, rollers for window blinds. 16,698, Brion, pulleys. 16,755, Harling, locks and fastenings. 17,035, Hoskings, handles for files, chisels, &c. 17,148, Crich, cupboard fasteners, &c. 17,440, Cooley & Honstain, fireproof granary. 17,498, Howorth (*Persehke*), water-closets. 17,646, Haddan (*Harris & Smart*), gas burners. 17,649, Sorge, water-purifying apparatus. 17,760, Mason & Musgrave, water-closets.

Trade and Craft.

A New Radiator.

The new "Clamond" gas radiator is worthy of the closest inspection, as it is neat in appearance, effective, and economical in working. It is the application of the well-known Kern incandescent gas-light burner system to gas fires, in which the proportions of air and gas have been carefully determined so as to secure almost perfect combustion, while giving at the same time a powerful radiant heat. One of these radiators, consuming 10 cub. ft. of gas per hour, will sufficiently warm a medium-sized room at a cost of 1d. for three hours (taking gas at 2s. 6d. per 1,000 cub. ft.). The smaller and simpler patterns can easily be fitted to existing grates, but as a certain amount of their heat passes into the flue they are not of such high efficiency as those in which the cast-iron casing is heated by the escaping gases, thus producing a combination of radiated and convected heat. The "Clamond" gas radiators are constructed to burn 10, 20 or 40 cub. ft. per hour. Those burning 20 or 40 cub. ft. have ten perforated clay tubes fed from both sides of the stove, so that one half may be extinguished when the room is sufficiently warm; special attention is called to this arrangement because it is a well-known fact that with gas stoves the best results are obtained by perfect combustion, which is not secured when the taps are checked. Further particulars of these radiators can be obtained from the Kern Burner Co., Ltd., of Kern Buildings, Gravel Lane, Southwark Street, S.E.



COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Oct. 31	Brockley, S.E.—Sorting Office	Commissioners of H.M. Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
„ 31	Wandsworth, S.W.—Intermediate School	Guardians	Lansdell & Harrison, 65 & 66 Basinghall Street, E.C.
„ 31	Low Bridge, near Kilfinane—Creamery	Co-operative Dairy Society, Ltd.	J. C. Bennett, Hon. Sec., Kilfinane, co. Limerick.
„ 31	Keighley—Public Free Library	Corporation	A. MacKewan and J. A. Swan, Newhall Street, Birmingham.
„ 31	Bootle, Lancs—Enlargement of School	School Board	J. Cox, 11 Dale Street, Liverpool.
„ 31	Cork—Concert Hall at International Exhibition, 1902	Exhibition Company	H. A. Cutler, Cork City Engineer, Municipal Buildings, Cork.
„ 31	Aberffrwd—Boundary Walls and Offices	School Board	T. Morgan, Tynyffordd, Ponterwyd.
„ 31	Lancaster—Pathological Laboratory	County Asylum	Clerk of Works, Lunatic Asylum, Lancaster.
„ 31	Oxford—Alterations to Market House	Corporation	City Estates Surveyor, Town Hall, Oxford.
„ 31	South Kirkby, nr. Wakefield—Shops, Houses, Stables, &c	Colliery Company, Limited	Garside & Pennington, Architects, Ropegate, Pontefract.
„ 31	Pontypool—Iron Schoolroom	Trevethin Church Council	T. Williams, Architect, Victoria Road, Pontypool.
„ 31	Blackpool—Underground Convenience	Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
„ 31	Blackpool—Shelter and Tramway Office	Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
„ 31	Sheffield—Wall and Pulling Down Buildings	Town Trust	Gibbs & Flockton, 15 St. James's Row, Sheffield.
Nov. 1	Navan, co. Meath—Alterations, &c., to Convent	—	Loretto Convent, Navan, co. Meath.
„ 1	Cardigan—Laboratory and Fittings	—	J. Stephens, 3 Green Street, Cardigan.
„ 1	Bangor—Villa	—	J. V. Brennan, Architect, Belfast Bank Chambers, Belfast.
„ 1	Morecambe—Bricks, Cement, &c.	Urban District Council	J. Bond, Surveyor to Council, Morecambe Street, Morecambe.
„ 1	Scarborough—Two Semi-detached Villas	—	J. Petch, Architect, Bar Street, Scarborough.
„ 2	Stainforth, near Doncaster—Classroom	School Board	H. B. Thorpe, Architect, Goole.
„ 2	Swindon—Chimney Shaft	Hospital Board	Halliday & Rodger, 14 High Street, Cardiff.
„ 2	Larne, Ireland—Chapels, &c., at Cemetery	Urban District Council	W. G. Young, Town Hall, Larne.
„ 2	Carlisle—Underground Lavatories	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
„ 2	Dewsbury—Arching Over and Inverting Beck	Corporation	Borough Engineer, Town Hall, Dewsbury.
„ 2	Elgin—Villa	—	Sutherland & Jamieson, Architects, Elgin.
„ 4	Appledore—Alterations at Buoy Store	Corporation of Trinity House	Buoykeeper, Trinity Buoy Store, Appledore.
„ 4	Aston Manor—Electric Power Station	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
„ 4	Birmingham—Carpenter's Shop at Infirmary	Parish Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
„ 4	Lancaster—Hospital	Asylums Board	Willink & Thickness, 14 Castle Street, Liverpool.
„ 4	Brighouse—Residence	—	Sharp & Waller, 32 Bradford Road, Brighouse.
„ 4	Ramsey—Board School	School Board	J. G. Stallebrass, Architect, North Street, Peterborough.
„ 4	Hull—New Dock	Joint Dock Committee	Sir John Wolfe Barry, 21 Delahay Street, Westminster.
„ 4	Burley, Leeds—Billiard Room	W. Pews	T. Winn & Sons, 92 Albion Street, Leeds.
„ 4	Cranhill Farm, Cammachmore, Aberdeen—House, Alterations, &c., to Steading.	—	Walker & Duncan, 3 Golden Square, Aberdeen.
„ 5	Devizes—Hospital (Twenty-two Beds)	Joint Isolation Hospital Committee	Bell, Withers & Meredith, 3 Salters' Hall Court, Cannon St., E.C.
„ 5	Hull—Offices	Lancashire and Yorkshire Railway Co.	H. Shelmerdine, Architect, Hunts Bank, Manchester.
„ 6	London, S.E.—House and Cottages for Children, &c.	St. Giles's, Camberwell, Guardians	A. E. Mullins, 16 Church Street, Camberwell, S.E.
„ 6	Portreath, Cornwall—Renovation of Chapel	Wesleyans	S. Hill, Architect, Redruth.
„ 6	Glasgow and Renfrew Railway—Station Buildings	Glasgow and Renfrew District Rly. Co.	Wharrie & Colledge, 109 Bath Street, Glasgow.
„ 6	Plumstead—Gardener's Cottage	Woolwich Union Guardians	Church, Quick and Whincop, Architects, William Street, Woolwich.
„ 6	Brentford—Isolation Hospital	Chiswick Urban District Council	A. Ramsden, Surveyor, Town Hall, Chiswick.
„ 6	Mallow—Labourers' Cottages	Rural District Council	M. Regan, Clerk, Mallow.
„ 6	Whitby—Church and School	Primitive Methodist Connexion	W. G. Smithson, 13 Bond Street, Leeds.
„ 6	Manchester—Electricity Sub-Station at Bennett Street	Corporation	City Surveyor, Town Hall, Manchester.
„ 6	Ardwick, Manchester—Electric Sub-Station at the Polygon.	Corporation	City Surveyor, Town Hall, Manchester.
„ 8	Great Grimsby—Seven Dwelling Houses	Co-operative Society, Ltd.	A. Gooseman, 112 Cleethorpe Road, Grimsby.
„ 8	Glasgow—Mason, Slater, Plasterer and Tile Work to Police Office in Kingston District.	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow
„ 8	Hunstanton—Terrace of Houses	—	W. Wren, Surveyor, Pleasant Villa, Mount Pleasant, Cambridge.
„ 9	Hunton, Bedale—Alteration to Cloak Room	School Board	T. F. King, Edgley, Leyburn.
„ 9	Dublin—Cement, Slates, Firebricks, &c.	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
„ 11	Bournemouth—Car Sheds and Repairing Shops	Town Council	F. W. Lacey, Engineer, Municipal Offices, Bournemouth.
„ 11	Nelson, Lancs—Schools	School Board	T. Bell, Architect, Grimshaw Street, Burnley.
„ 11	Mansfield—Electricity & Refuse Destructor Works, &c.	Town Council	Vallance and Westwick, Architects, Mansfield.
„ 12	Cleator Moor—Butcher's Shop, Slaughterhouse, &c.	Co-operative Society, Ltd.	Central Office of Society, Cleator Moor.
„ 12	Ilford—Tramway Car Sheds, Workshops, &c.	Urban District Council	H. Shaw, 7 Cranbrook Road, Ilford.
„ 12	Dover—Infirmary and Nurses' Home at Workhouse	Union Guardians	Cresswell & Newman, 54 Castle Street, Dover.
„ 12	London, S.W.—Public Offices	H.M. Commissioners of Works	H.M. Office of Works, Storey's Gate, S.W.
„ 13	Deal—Engine House, Boiler House and Coal Store	Joint Water Board	T. & C. Hawkesley, 30, Great George Street, Westminster, S.W.
„ 18	Leeds—Engine House, Stabling, &c., at Fire Station	Watch Committee	P. Robinson, 72 Albion Street, Leeds.
„ 18	Drum—Renovation of Parish Church	Incumbent and Churchwardens	Drum Glebe.
„ 22	Newbridge, near Ruabon—House, Out-Offices, &c.	—	W. H. Johns, Architect, Vroncysyllte, Llangollen.
	ENGINEERING:		
Oct. 31	Knottingley—Waterworks	Urban District Council	J. Richardson, Engineer, East Parade Chambers, Leeds.
„ 31	Luxemburg—Water Supply from Kopstal to Luxemburg	—	Municipal Authority, Luxemburg.
Nov. 1	Blaydon-on-Tyne—Widening Shaft	Stella Coal Company	Hedgefield Offices, Blaydon.
„ 1	Edinburgh—Waterworks	Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
„ 1	St Aidan's-by-the-Sea—Sea Wall	—	F. H. Anson, 15, Dean's Yard, Westminster, S.W.
„ 2	Levenshulme—Refuse-destructor Installation	Urban District Council	J. Jepson, Surveyor, Levenshulme.
„ 3	Baracaldo, Biscaya—Water Supply Works	—	Municipality, Baracaldo.
„ 4	Liverpool—Electric Cables, &c.	South Lancs. Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29, Great George Street, Westminster.
„ 4	Barrow-in-Furness—Heating New School	School Board	H. T. Fowler, Architect, Ramsden Square, Barrow-in-Furness.
„ 4	Dunleer and Drogheda—Two Steel Girder Bridges	Great Northern Railway Co. (Ireland)	Company's Engineer-in-Chief, Amiens Street Terminus, Dublin.
„ 4	Leon, Spain—Water Supply Works	—	Municipality, Leon.
„ 4	Penrith—Sinking Well	Rural District Council	J. W. Smith, Clerk to Council, Penrith.
„ 5	Oldham—Electric Cables, Motor-booster, &c.	Corporation Electricity Committee	A. Andrew, Gas and Water Offices, Oldham.
„ 5	Radcliffe, nr. Manchester—Reservoir (22 million galls.)	East Lancs Paper Mill Co., Ltd.	J. Sellars & Son, Surveyors, Union Chambers, Bury.
„ 5	Bromley, Kent—Surface Water Drainage Works	Urban District Council	Council's Surveyor, Offices, Bromley, Kent.
„ 6	Liscarroll—Pump	Mallow Rural District Council	M. Regan, Clerk, Workhouse, Mallow.
„ 6	Manchester—Electrical Plant	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
„ 6	Mallow—Water Supply	Rural District Council	M. Regan, Clerk, Workhouse, Mallow.
„ 8	Rochdale—Three Lancashire Boilers, &c.	Corporation	Lacey, Clirehugh & Sillar, 78, King Street, Manchester.
„ 8	Glasgow—Heating Halls, Library and Police Office	Corporation	Office of Public Works, City Chambers, 64, Cochrane St, Glasgow.
„ 12	Barking, Essex—Electric Crane, &c.	Urban District Council	C. F. Dawson, Council's Surveyor, Public Offices, Barking.
„ 12	Swindon—Machinery and Electrical Plant	Corporation	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 12	Dartford—Pumping Machinery	Urban District Council	W. Harston, Surveyor, High Street, Dartford.
„ 12	Cardiff—Reconstructing Bridges, &c.	Great Western Railway Co.	Engineer, Paddington Station, N.W.
„ 12	Rothwell, Northants—Waterworks	Urban District Council	W. T. Pearson, Surveyor, Back Chambers, Rothwell.
„ 12	Willesden—Electrical Plant	Urban District Council	E. T. Ruthven-Murray, Electrical Engineer to Council, Public Offices, Dyne Road, Kilburn, N.W.
„ 14	Manorhamilton, Ireland—Water Supply Scheme	Rural District Council	P. Keany, Clerk, District Council Office, Manorhamilton.
„ 16	Chesham—Electric Lighting	Urban District Council	J. G. How, Clerk, Chesham.
„ 18	Bury, Lancs—Tramcars	Tramways Committee	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 20	Wimbledon—Settling Tanks, &c.	Urban District Council	Council Offices, Broadway, Wimbledon.
„ 23	Boulder City, Western Australia—Electric Tramway	City Council	Agent-General's Office, London.
„ 25	King's Lynn—Tug	Conservancy Board	J. Pollock, Sons & Co., 22 Billiter Street, E.C.
„ 26	East London, South Africa—Electric Plant	—	Dyer & Dyer, 17 Aldermanbury, E.C.
Dec. 3	London, E.C.—Artesian Well at Baths	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Old Street, E.C.
„ 6	Hull—Construction of New Dock (50 acres)	Joint Dock Committee	Sir J. Wolfe Barry & Partners, 21 Delahay Street, Westminster.
„ 16	Ireland—Single Railway Line Viaduct over River Barrow.	Fishguard and Rosslare Railways and Harbours Co.	Sir B. Baker, 2 Queen Square Place, Queen Anne's Mansions, Westminster, S.W.
„ 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
1902. Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works, Sydney.
Mar. 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
	FURNITURE:		
Nov. 4	Beckenham—Furniture for Council Chamber, &c.	Urban District Council	J. A. Angell, Surveyor, Offices, Beckenham.
„ 6	Rotherham—Furniture, &c., for Imbecile Blocks	Union Guardians	J. T. Crowson, Master, Workhouse, Rotherham.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
Oct. 31	Blackpool—Iron Roof, Columns, &c, for Shelter and Tramway Office.	Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
„ 31	Knottingley—Cast-iron Water Pipes, &c.	Urban District Council	J. Richardson, East Trade Chambers, Leeds.
Nov. 1	Edinburgh—Cast-iron Pipes	Water Trustees	W. A. Tait, 72A George Street, Edinburgh.
„ 1	Utrecht—2,900 tons of Steel Rails, &c.	Netherlands Central Railway Co.	Railway Company, Utrecht.
„ 1	Wigan—Steel Girder Work and Iron Roof Trusses for Tramway Sheds.	Corporation	H. C. Bishop, Borough Electrical Engineer, Bradford Place, Wigan.
„ 1	Morecambe—Cast-iron Pipes, &c...	Urban District Council	J. Bond, Surveyor, Council Offices, Morecambe Street, Morecambe.
„ 2	Sheffield—Ironmongery	School Board	J. F. Moss, Clerk, School Board Offices, Sheffield.
„ 4	Bishop Auckland—Lamp-posts, &c.	Rural District Council	O. Johnston, Surveyor, Crofton House, Bishop Auckland.
„ 4	Wandsworth Park, S.W.—Wrought-iron Fencing ..	London County Council	Parks Department, 11 Regent Street, S.W.
„ 5	Hertford—Copper-frame Street Lanterns, &c.	Corporation	Borough Surveyor, Hertford.
„ 6	North Shields—Galvanized Iron Hot-water Tanks ..	Tynemouth Union Guardians	Master, Workhouse, Preston Road, North Shields.
„ 9	Dublin—Railway Stores	Great Northern Railway Co. (Ireland) ..	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
„ 11	London, S.W.—Rails, &c.	——	Agent-General for Victoria, 15 Victoria Street, London.
„ 12	Rothwell, Northants—Cast-iron Drains (250 tons) ..	Urban District Council	W. T. Pearson, Surveyor, Bank Chambers, Rothwell.
	PAINTING AND PLUMBING:		
Oct. 31	Haltwhistle, near Carlisle—Water Supply to Fountain.	Blenkinsop Parish Council	Mr. Wilkinson, Clerk, Town Foot Farm, Haltwhistle.
Nov. 1	Morecambe—Lead, &c.	Urban District Council	J. Bond, Surveyor, Council Offices, Morecambe Street, Morecambe.
„ 1	Bradford, Wincobank and Hasland—Painting, &c, House Property.	Midland Railway Company	Company's Architect, Cavendish House, Derby.
„ 2	Elgin—Painting Villa	——	Sutherland & Jamieson, Architects, Elgin.
„ 4	Barrow-in-Furness—Painting and Colouring School..	School Board	W. Hutchinson, Clerk, School Board Offices, Barrow-in-Furness.
„ 6	Christiania—Oils, White Lead, &c.	Norwegian State Railways Administration	Manager, Engineering Department, Christiania.
„ 6	Cairo—Oil	——	Financial Secretary, Cairo
„ 8	Glasgow—Painting and Plumber Work at Hall, Library and Police Office in Kingston District.	Corporation	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
„ 8	Hope, near Eccles—Painting Outside of Infirmary ..	Salford Union Guardians	Steward, Infirmary, Hope, near Eccles.
„ 9	Dublin—Colours, Oil, &c.	Great Northern Railway Co. (Ireland) ..	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
„ 20	Manchester—Oil	Gas Committee	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
„ 25	Canterbury—External Painting	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, High St., Canterbury
	ROADS AND CARTAGE:		
Oct. 31	New Barnet—Making-up Roads	East Barnet Urban District Council ..	H. York, Surveyor, Station Road, New Barnet.
Nov. 1	Enfield, Middlesex—Footpaths	County Council	H. T. Wakelam, County Surveyor, Guildhall, Westminster.
„ 2	Chingford, Essex—Making-up, &c.	Urban District Council	W. Stair, 14 The Parade, Chingford.
„ 2	Hampton Wick—Re-topping Roads	Urban District Council	J. N. Horsfield, Council's Surveyor, High Street, Hampton Wick.
„ 2	Twickenham—Road and Works	——	G. F. Sharpe, 57 Chancery Lane, W.C.
„ 2	Southend-on-Sea—Norway Kerb, Paving, Pitchers, &c.	Essex County Council	P. J. Sheldon, County Surveyor, Duke Street, Chelmsford.
„ 4	London, N.—Road Works	Urban District Council	E. J. Lovegrove, Offices, Southwood Lane, Highgate, N.
„ 4	London, W.—Renewing Tarred Limestone Paving, &c.	Borough Council	G. Weston, Borough Surveyor, Town Hall, Paddington, W.
„ 5	Crewe—Street Works	Town Council	G. Eaton-Shore, Borough Surveyor, Earle Street, Crewe.
„ 5	London, N.—Making-up	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
„ 5	Windsor Blue Brick Paving (600 yards super.) ..	Town Council	Borough Surveyor, Alma Road, Windsor.
„ 9	Manchester—Wagons	Tramways Committee	J. M. M'Elroy, 55 Piccadilly, Manchester.
„ 9	Ince, Lancs—Street Works	Urban District Council	Winstanley & Ashworth, 42 Deansgate, Manchester.
„ 9	Middleton, Lancs—Paving, &c.	Corporation	W. Welburn, BoroughSurveyor, Town Hall, Middleton.
„ 9	Pinner—Footpath	Parish Council	Down's Farm, Pinner.
„ 12	London, E C.—Harness, &c.	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Town Hall, Old Street, E.C.
„ 20	Croydon—Highway Improvements	Rural District Council	R. M. Chart, Council's Offices, Town Hall, Croydon.
„ 30	Johannesburg—Pavements..	——	"The Times," London, E.C.
	SANITARY;		
Oct. 31	Blackpool—Sanitary Fittings to Underground Conveniences.	Corporation	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
„ 31	Bramhall, Stockport—Sewage Output Works, &c. ..	Urban District Council	E. Sykes, 13 Warren Street, Stockport.
„ 31	Uxbridge—Reconstruction of Workhouse Drainage ..	Union Guardians	J. F. Stow, Engineer, Corn Exchange, Uxbridge.
Nov. 1	St. Aidan's-by-the-Sea—Outfall Sewer and Sea Wall ..	Lord Crewe's Trustees	F. H. Anson, 15 Dean's Yard, Westminster.
„ 1	Chippenham—Pipe Sewer	Rural District Council	A. H. Lapham, Surveyor, Corsham, Wilts.
„ 1	Morecambe—Stoneware Pipes, Sewage Outfall, Septic Tank, &c.	Urban District Council	J. Bond, Surveyor, Council Offices, Morecambe Street, Morecambe.
„ 2	Cowbridge, Wales—Sewerage Scheme	Rural District Council	G. E. Morris, Surveyor, St. Quintius, Llanblethan, Cowbridge.
„ 4	Liverpool—Stoneware Pipes, &c.	South Lancs. Electric Traction & Power Co., Ltd.	Kincaid, Waller & Mansville, 29 Great George Street, Westminster.
„ 4	Bishop Auckland—Pipe Sewers	Rural District Council	C. Johnson, Surveyor, Croftan House, Bishop Auckland.
„ 4	London, N,—Sewers, &c.	Hornsey Urban District Council	E J. Lovegrove, Council Offices, Southwood Lane, Highgate, N.
„ 4	Romford—Stoneware and Iron Pipe Sewers	Urban District Council	J. Turvey, Surveyor, Market Place, Romford.
„ 5	Walsall—Stoneware Pipe Sewer, &c.	Corporation	Borough Surveyor, Bridge Street, Walsall.
„ 5	Bromley, Kent—Surface-Water Drainage Works ..	Urban District Council	F. H. Norman, Clerk, Council Offices, Bromley, Kent.
„ 5	Radcliffe-on-Trent—Sewerage, &c. Works	Bingham Rural District Council	W. H. Radford, Engineer, Albion Chambers, King St., Nottingham.
„ 6	New Ross, Ireland—Main Sewer at Irishtown.. ..	Urban District Council	M. J. Finn, Clerk, Council Office, New Ross.
„ 9	Busby, Lanarkshire—Drainage Works	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
„ 15	Heage—Sewage Disposal Works and Sewers	Urban District Council	Hunter & Woodhouse, Engineers, Belper.
	TIMBER:		
Nov. 9	Dublin—Timber	Great Northern Railway Co (Ireland) ..	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
„ 18	Lisbon—Mineral Oil for Timber Injections	Royal Portuguese Railway Co.	Company's Officer, 28 Rue de Chateaudun, Paris.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 31	Derby—Tramway Offices, Waiting-rooms and Conveniences, &c.	[Restricted to Local Architects], £40, £20 & £10.	H. F. Gadsby, 15 Tenant Street, Derby.
„ 31	Addingham—Club	£20.	W. Thomas, Conservative and Unionist Club, Addingham.
Nov. 5	Skelmanthorpe—Engineer wanted for Sewerage and Sewage Disposal Scheme.	——	W. Fisher, Clerk to U.D.C., Skelmanthorpe, near Huddersfield.
„ 14	Manorhamilton—Water Supply Scheme	——	P. Keany, Clerk to R.D.C., Manorhamilton, Ireland.
„ 14	Kingston-upon-Thames—Public Library	——	H. A. Winser, Town Clerk, Kingston-on-Thames.
„ 22	Barnsley—Guardians' Offices	£20.	C. J. Tyas, 17 Regent Street, Barnsley.
„ 23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
„ 23	Bexhill—Isolation Hospital	£25.	E. S. Douglas, Town Hall, Bexhill.
Dec. 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902. June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Jan. 31	Hull—Art School (cost not to exceed £10,000) ..	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No Date.	Northampton—Master's House and Boys' Boarding-House, &c.	25 guineas.	J. Haviland, 2 St. Giles Square, Northampton.
„	Stockport—Municipal Buildings (send in names by Nov. 4).	——	R. Hyde, Town Clerk's Office, Stockport.

Masters and Men.

Barrow Joiners' Dispute.—There is every probability that the dispute between Messrs. Gradwell and their joiners, at Barrow, will be amicably settled. The men objected to shipwrights rebuilding a new pier, and in consequence all Gradwell's men were called out. A deputation of the men met the Masters' Association last week, and after a prolonged discussion it was decided to refer the matter to arbitration of two men from each side, along with an umpire.

The Blackpool Joiners' Strike.—The master-builders of Blackpool have made another attempt to come to terms in respect of the joiners' strike. The masters were asked to consider a proposal from the men to allow them to go in at 8¾d. per hour. The masters have referred the men to a previous letter written to them on this point, in which they state that the men can return at 8½d. per hour. They definitely refuse, however, to make any further concessions.

The Aberdeen Building Branch of the United Operative Masons and Stonecutters' Union.—At a recent meeting (Mr. George Ogg, president of the local branch, in the chair) it was decided to have the union represented at the next Trades Union Congress, which is to be held in Falkirk in April, 1902. It was also resolved to have a series of lectures on architecture, geology and kindred subjects delivered during the winter months. The union agreed to pay six members £25 each for the loss of sight of an eye, under the accident benefit rules which have just come into operation; also to pay the maximum accident benefit of £50 to another workman for the loss of an arm.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BARKING (ESSEX).—For making-up, &c, Longbride Road for the Barking Urban District Council. Mr. C. F. Dawson, surveyor:—

J. Jackson, Plaistow	£4,355	3	5
J. Killingbach, London	4, 66	18	5
T. Adams, London	4,063	0	0
W. Griffiths & Co., Ltd, London	3,560	0	0
W. Iles, Southend	3, 00	0	0
D. T. Jackson,* Barking	3,491	4	10
Wilson, Broader, & Co, Ilford	3,182	9	4

* Accepted. [Surveyor's estimate, £3,650 1 s. 9d.]

BECKENHAM.—For making-up the following roads: Queen Anne Avenue, 170 yards in length; Church Road, Shortlands, 220 yards in length; and Bromley Grove, 300 yards in length, for the Beckenham Urban District Council:—

G. Wilson, Westbury Road, Walthamstow	£4,491	0	0
C. Pearce, Havelock Street, Forest Hill, S.E.	4,113	12	8
Fry Bros., Lion Wharf, Greenwich, S.E.	4,041	13	0
Mowlem & Co.,* Grosvenor Wharf, Westminster, S.W.	3,677	4	2

* Accepted.

CANNOCK (STAFFS.).—For laying mains, erection of pumping station, reservoir, and other appurtenant works in connection with the Cheslyn Hay water supply, for the Cannock Rural District Council. Mr. R. E. W. Berrington, engineer, Bank Buildings, Wolverhampton:—

H. Holloway, Wolverhampton	£6,256	16	4
J. Mackay, Smethwick	4,973	17	0
Braithwaite & Co, Leeds	4,900	0	0
Embrey & Sons, Fenton, Staffs	4,781	5	6
J. Owens, Wolverhampton	4,7 9	0	0
C. E. Carden, Penkridge, Staffs	4,662	18	1
W. H. Reading,* Wolverhampton	4,575	0	0

* Accepted.

CHEADLE (CHESHIRE).—For the erection and completion of mortuary buildings and chapels at a proposed new cemetery, Stockport Road, Cheadle, together with the works incidental thereto, for the Cheadle and Gatley Urban District Council. Mr. Geoffrey H. Brady, architect, 18 Little Underbank, Stockport:—

Sheldon Bros., Lyne Grove, Cheadle	£5,784
J. Broadhurst, Lyne Street, Stockport	5,620
J. K. Coates, Manchester Road, Wilmslow	5,463
M. Lane, Heaton Lane, Stockport	5,3 0
J. Briggs, Lancashire Hill, Stockport	5,370
Gerrard & Son, Ltd., Swinton	5,173
H. W. Meadows, Georges Road, Stockport	5,160
D. Eadie, Short Street, Heaton Norris, Stockport	4,955
W. Pownall,* Royal George Street, Stockport	4,930

* Accepted.

CHORLTON-CUM-HARDY.—For the erection of Primitive Methodist Church. Messrs. Moulds & Porritt, architects, 77 King Street, Manchester. Quantities by the architects:—

Byrom	£2,370	0
Rowbotham	2,330	6
Shaw	2,300	0
Bladon	2,224	0
Gerrard*	2,170	0

* Accepted.

COLCHESTER.—For the erection of a school in Canterbury Road, Colchester, for the Colchester School Board. Messrs Goodey & Cressall, architects, Victoria Chambers, Colchester:—

F. Dupont & Co., Colchester	£10,979
E. West, Chelmsford	10, 43
W. Chambers, Colchester	10,440
G. Dobson & Son,* Colchester	9, 80

* Accepted.

GEDLING (NOTTS).—For the erection of two shops at Gedling, Notts., for Mr. C. E. Ashlin. Mr. Hedley J. Price, A.R.I.B.A., architect and surveyor, 24 Low Pavement, Nottingham:—

W. & J. Simons, West Bridgford	£1,275	0	0
J. G. Short, Nottingham	1,256	0	0
A. E. Smith, Nottingham	1,223	0	0
T. & W. Lee, Nottingham	1,204	0	0
W. Maule, Nottingham	1,195	0	0
R. Fisher, Nottingham	1,156	0	0
J. Musson, Carrington, Nottingham	1,145	0	0
Pett & Co., Colwick	1,128	13	6
T. Whittaker, Nottingham	1,120	0	0
J. Lewin, Colwick, Nottingham	1,120	0	0
G. Sadler, Nottingham	1,093	0	0
T. H. Harper, Colwick, Nottingham	1,040	0	0
T. Bellamy & Son,* Gedling	1,030	0	0

* Accepted.

GREAT YARMOUTH.—For the erection of farmhouse and farm buildings at Br nston, for Sir Savile B. Crossley, Bart., M.P. Messrs. Bottle & Olley, architects, 5 Queen Street, Great Yarmouth:—

Carter & Wright, Yarmouth	£1,5 8	17	0
John Ward, Yarmouth	1,559	0	0
G. Elsey, Lowestoft	1,442	12	9
J. F. W. Bray, Yarmouth	1,429	0	0
J. S. Smith, Norwich	1,426	10	0
J. Young & Son, Norwich	1,4 1	0	0
S. & F. Smith,* Yarmouth	1,392	0	0

* Accepted.

GREAT YARMOUTH.—For the erection of cemetery chapel, superintendent's house, &c., at Caister, for the Great Yarmouth Town Council. Mr. J. W. Cockrill, M.I.C.E., A.R.I.B.A., borough surveyor, architect. Quantities by the borough surveyor:—

Eastoe	£1,987	0
Potter, Chelmsford	1,935	0
Gunns	1,9 7	17
Coffey	1,898	0
Carter & Wright	1,866	0
Hanyard, Cambridge	1, 25	0
S. & F. Smith	1,816	10
Bray	1,783	0
Grimble	1,760	0
Herman	1,754	0
Balls	1,742	0
Wright	1,740	0
Beech,* Hemsby	1, 04	0

* Accepted. [Rest of Yarmouth.]

GREENOCK.—For the construction of car sheds and repair shops in Greenock, for the Greenock and Port Glasgow Tramways. Length 290 feet by 90 feet wide, including drainage, water supply, lavatories, and inspection pits:—

Miller & Co.	£7,670	0	0
Aitkenhead & Co.	7,622	0	0
Whitelaw & Co.	7,055	12	6
G. Wilby & Co., Manchester	7,023	0	0
J. McEwan*	6,980	17	6
J. A. Millen, Glasgow	6,370	0	0

* Accepted. [Rest of Greenock.]

HALFWAY STREET (NEAR SIDCUP).—For engineering works at the new children's homes, Sidcup, Kent, for the Greenwich Union Guardians. Messrs. T. Dinwiddy, F.R.I.B.A., and T. W. Dinwiddy, architects:—

W. & J. Tullis, Ltd.	£9,061
J. Fraser & Sons	8,971
Clements, Jeakes & Co.	8,750
Tomlinson & Milan, Ltd.	8,6 0
Bradford & Co.	8,055
J. & F. May	8,000
Potter & Sons, Ltd.	7,890
Goddard, Warner & Massey, Ltd.	7,781
Summerscales & Sons, Ltd.	7,645
Williams & Sons, Ltd.	7,350
Moorwood, Sons, & Co., Ltd	7,246

HARROW.—For carrying out a public street improvement at Lowlands road for the Harrow-on-the-Hill Urban District Council. Mr. J. Percy Bennetts, engineer and surveyor:—

Lowlands Road.

Bracey & Clarke, Watford	£746	0
Free & Sons, Maidenhead	774	0
E. W. Hollingsworth, Wealdstone	777	0
Felkin & Watson, Southall	7 2	0
H. Brown, Watford	876	0
Wimpey & Co, Hammersmith	838	0
C. Ford, Harlesden	84	0
Meston & Hale, Harlesden	845	15
T. Adams, Wood Green	900	0
Neave & Son, Kensal Rise	1,0 0	0
A. Frost, Wealdstone	1, 23	0

[Surveyor's estimate, £800.]

Recreation Ground.

E. H. Hollingsworth	1,137	6
Bracey & Clarke	1,185	0
C. Ford	1,393	0
Wimpey & Co.	1,443	0
Meston & Hale	1,532	0
J. Hiscox, Harrow	1,601	0
T. Adams	1,731	0
Neave & Son	1,741	0

[Surveyor's estimate, £1,200.]

LEICESTER.—For the erection of a warehouse, Charles Street, Leicester, for Messrs. Davies & Co., Ltd. Mr. Charles Kempson, A.R.I.B.A., A.M.I.C.E., architect. Quantities by the architect:—

T. Herbert & Sons	£3,623	0	0
T. R. Tebbatt	3,483	0	0
Bentley & Co.	3,400	0	0
H. Bland	3,377	0	0
F. Rudkin	3,36	14	6
Clarke & Garratt	3,330	0	0
F. Elliott	3,314	0	0
W. Haddon	3,31	0	0
J. Mason & Son	3,2 5	7	0
Bradshaw Bros.	3,245	0	0
J. H. Clayton	3,241	0	0
Beck & Co.*	3,221	0	0

* Accepted.

LONDON, S.E.—For the erection of a new receiving ward for children at their workhouse, Renfrew Road, Lower Kennington Lane, S.E. for the Guardians of Lambeth, Mr. Sydney R. J. Smith, F.R.I.B.A., architect, 14 York Buildings, Adelphi, W.C.:—

J. J. Richards, 9, Shannon Grove, Brixton, S.W.	£2,820	16
J. Chessum & Sons, Crown Wharf, Oni r Road, Bow, E.	2,310	0
General Builders, Ltd., Progress Works, Wharf Road, Notting Hill	2,197	0
Foster Bros., Suffolk Road, Norwood Junction, S.E.	2,111	0
H. M. Patrick, Point Pleasant, Wandsworth, S.W.	2,105	0
R. M. Hughes, Bradford Street, Birmingham	2,070	0
T. Lapthorn & Co., , High Street, Lambeth	1,997	0
C. Brightman, Queen's Road, Watford	1,955	0
Davis & Leaney, Lancaster Gardens, Southend-on-Sea	1,975	0
H. L. Holloway, Union Works, Church Street, Deptford	1,972	0
W. Wallis, Lincoln House, Ramsden Road, Balham, S.W.	1,931	6
L. Whitehead & Co. Portland Place, Clapham Road, S.W.	1,925	0
D. Gibb & Co., 1A Birchfield Street, West India Road, London, E.	1,920	0
B. E. Nightingale, Albert Works, Albert Embankment	1,900	0
Herris & Wardrop, 10 to 14, Wallwood Street, Limehouse, E.	1,897	0
J. T. Robey, 124 Bow Road, Bow, E.	1,8 0	0
J. Tyerman, 220 Walworth Road	1,861	0
J. Appleby, Cornwall Works, Stamford Street, Lambeth, S.W.	1,850	0
H. Kent, 17 Albion Road, Lewisham, S.E.	1,849	0
G. Barker, 57 Philpot Street, Commercial Road, East	1, 49	0
J. O. Richardson, Albert Works, Peckham, S.E.	1,830	0
Voller & Goodfellow, 12 Truro Road, Wood Green, N.	1,636	0
J. R. Ward,* 19A Bridge Road, Battersea, S.W.	1,593	0

* Accepted.

LONDON, W.C.—For alterations and additions to Charing Cross Hospital, for the Council. Mr. A. Saxon Snell, F.R.I.B.A., architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

Howard & Co., Covent Garden	£92,722
Patman & Fotheringham, Bloomsbury	89,300
Bywaters & Sons, Regent Street	87,500
H. Lovatt, Wolverhampton	87,000
Spencer, Santo, & Co., Westminster	86,775
Trollope & Sons, Pimlico	86,470
Higgs & Hill, South Lambeth Road	85,844
B. E. Nightingale, Lambeth	85,767
Holloway Bros.,* Lambeth	82,730

* Accepted.

NOTTINGHAM.—For alterations and additions to form three shops at the junction of Mansfield Road and Forest Road, Nottingham. Mr. Hedley J. Price, A.R.I.B.A., architects and surveyors, 24 Low Pavement, Nottingham:—

O. T. ochtmann	£1,13	18	6
G. Baron	1,130	13	8
J. Hutchinson & Son	1,110	0	0
H. Scott & Son	1, 75	0	0

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H. Green & Son	1,055	9	0
A. E. Smith	1,052	16	0
J. G. Short	1,047	0	0
T. Cuthbert	1,046	0	0
J. Musson, Carrington, Nottingham	1,030	0	0
J. Cooper & Son	1,025	0	0
R. Fisher	1,002	19	0
T. & W. Lee	962	19	0
J. & J. Adams*	915	0	0

* Accepted. [Rest of Nottingham.]

PORTSMOUTH.—For alterations and additions to the Church Street Board School, Landport for the Portsmouth School Board. Mr. A. H Bone architect, Cambridge Junction, Portsmouth:—

H. Clark & Sons, Landport	£3 700	0
M. Colthe up, Portsmouth	3.515	0
W. W. Learmouth, Landport	3,509	12
H. H. Ball, Southsea	3,449	0
S. Salter, Southsea	3 288	0
W. T. Dugan, Portsea	3 201	19
H. Jones, Southsea	3,176	0
J. W. Perkins, Landport	3,149	0
C. M. Dash, Gosport	3 089	0
J. Cockerell,* Southsea	2,977	0

* Accepted.

SOUTH SHIELDS.—For the erection of a dwelling-house for Mr. A. Brown, at Westoe, South Shields. Mr. Henry Grieves, architect, South Shields:—

W. J. Robertson South Shields	£850	0	0
R. Allison, Whitburn	845	0	0
J. Young,* Tyne Dock	813	16	9

* Accepted.

SURBITON.—For the construction of about 4,000 yards of stoneware storm-water drains of various sizes from 6 in. to 2 ft., at Alpha, King Charles's, Ewell. Kingsdown, Langley, and Oak Hill roads, Surbiton, with inspection chambers. gulleys, and connections thereto, for the Urban District Council:—

G. Osenton, Westerham	£4,965	0	0
W. Adamson, Kingston-on-Thames	4,638	8	5
A. Green, Uxbridge	4,604	17	4
T. Adams, London	4,319	0	0
Cooke & Co, London	4,206	13	3
C. Ford, Harlesden	3,794	0	0
Free & Sons, Maidenhead	3,739	12	3
Barry Building and Contracting Society, Ltd, Barry Dock, Glamorgan	3,731	14	7
Killingback & Co., Camden Town	3,718	0	0
Johnson & Langley, Brockley	3,596	0	1
S. Atkins, Kingston-on-Thames	3,510	10	0
S. Kavanagh,* Surbiton	3,383	0	0

* Accepted. [Surveyor's estimate, £3,752.]

WINKFIELD (BERKS).—For alterations and additions to Wilton Lodge, Winkfield, Berks, for Mr. E. C. Rawlings. Mr. E. Douglas Hoyland, architect, 2 Walbrook, E.C.:—

T. Trust, Ascot	£430
H. Charman, Ascot	380
East & Hyde, Binfield	363
G. Brown, Bracknell	350
W. J. May, Bracknell	290

[Architect's estimate, £[illegible]5).]

WITHAM (ESSEX).—For the erection of an infants' school to accommodate 100 at Chipping Hill, Witham, for the Witham School Board. Mr. W. P. Perkins, surveyor:—

M. Richards & Sons, Witham	£1,345	5
Cracknell & Baker, Chelmsford	1 230	13
E. West, Chelmsford	1,087	0
F. Johnson, Chelmsford	1,059	0
H. Potter, Chelmsford	1 050	0
J. McKay, Clacton on-Sea	1,050	0
J Smith & Son,* Witham	1,0[illegible]5	0

* Accepted.

WREXHAM.—For the erection of a new house, warehouse, and stables. Rivulet Road, Wrexham, for Messrs. Thomas Hughes & Co. glass merchants, Wrexham. Mr. Frederick B. James, architect, 1 Park View, Holt Road, Wrexham:—

T. Jones	£1,819	0
W. E. Samuel	1,780	9
Davies Brothers	1,717	14
W. Hughes*	1,660	0

* Accepted. [All of Wrexham.]
Plumbing separate contract.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	15	0
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.		—		1	8	7
Colza Oil, English	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels	do	1	12	3		—	
Petroleum, American	per gal.	0	0	7⅛	0	0	7¼
Do. Russian	do.	0	0	6⅝	0	0	6¾
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	4	17	0	4	18	0

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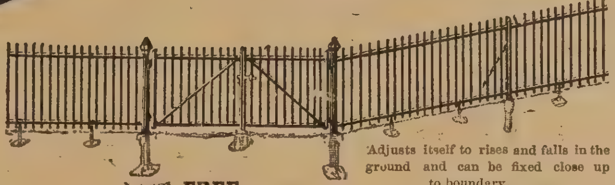

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COMING EVENTS.

Wednesday, October 30.

AUCTIONEERS' INSTITUTE.—Inaugural Address by the President, Mr. W. B. Rogers, in the Examination Hall, Victoria Embankment, 7.45 p.m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Mr. Percy F. Nursey, C.E, on "The Evolution of High Explosives," 7.30 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—General Meeting of Students at 7.30 p.m., at 38, Northumberland Street, Newcastle-on-Tyne.

Thursday, October 31.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Prof. Henry Robinson, M.I.C.E., on "Scavenging and Disposal of House-Refuse," 7 p.m.

SOCIETY OF ANTIQUARIES.—Sir Henry Howorth on "*Excelsior* and its Prophet Ruskin," 8.30 p.m.

WORSHIPFUL COMPANY OF CARPENTERS, Carpenters' Hall, London Wall, E.C. (Lectures on Sanitary Building Construction)—Prof. T. Roger Smith, F.R.I.B.A., on "The Supply, Distribution and Use of Water in Buildings," 7.30 p.m.

Friday, November 1.

INSTITUTE OF JUNIOR ENGINEERS.—Presidential address by Sir John Jackson, F.R.S.E., at Westminster Palace Hotel, 8 p.m.

ARCHITECTURAL ASSOCIATION.—Mr. A. Wood, M.A., F.S.A., on "Cambridge in Early and Mediæval Times," 7.30 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. W. Hunting, F.R.C.V.S., on "Signs of Health and Disease in Animals destined for Food," 7 p.m.

ST. JAMES'S PALACE.—Public Exhibition of the plans submitted for the proposed Queen Victoria Memorial opens.

INSTITUTION OF MECHANICAL ENGINEERS.—Adjourned discussion on the 2nd Gas Engine Research Report, by Prof. Frederic W. Burstall, 8 p.m.

Saturday, November 2.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall, London Wall, E.C. Adjourned discussion on Mr. W. T. Sweett's paper on "Modern Joinery," 6 p.m.

Monday, November 4.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Opening Address of the Session by Mr. William Emerson, President, 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. William Fergusson Irvine, Hon. Sec. Records Society of Lancashire and Cheshire, on "The Ancient Streets and Boundaries of Liverpool," 6 p.m.

SOCIETY OF ENGINEERS.—Mr. Roger Gaskell Hetherington, M.A., on "The Main Drainage of Ilford," 7.30 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr W. Hunting, F.R.C.V.S., on "The Names and Situations of the Organs of the body in Animals," 7 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. C. F. Brindley, on "Organ Cases and Organ Chambers."

Tuesday, November 5.

INSTITUTION OF CIVIL ENGINEERS.—Inaugural address by the President, Mr. Charles Hawksley. Presentation of the Council's Awards and reception in the Library, 8 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. W. Johnston Roberts on "Some Law Points Useful to Architects," 7.45 p.m.

Wednesday, November 6.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.). Inspection and Demonstration at Knacker Yard, at 3 p.m.—Mr. W. Hunting, F.R.C.V.S., on "Practical Methods of Stalling and Slaughtering Animals," at 7 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Mrs. Craigie on "Dante and Botticelli," 7.45 p.m.

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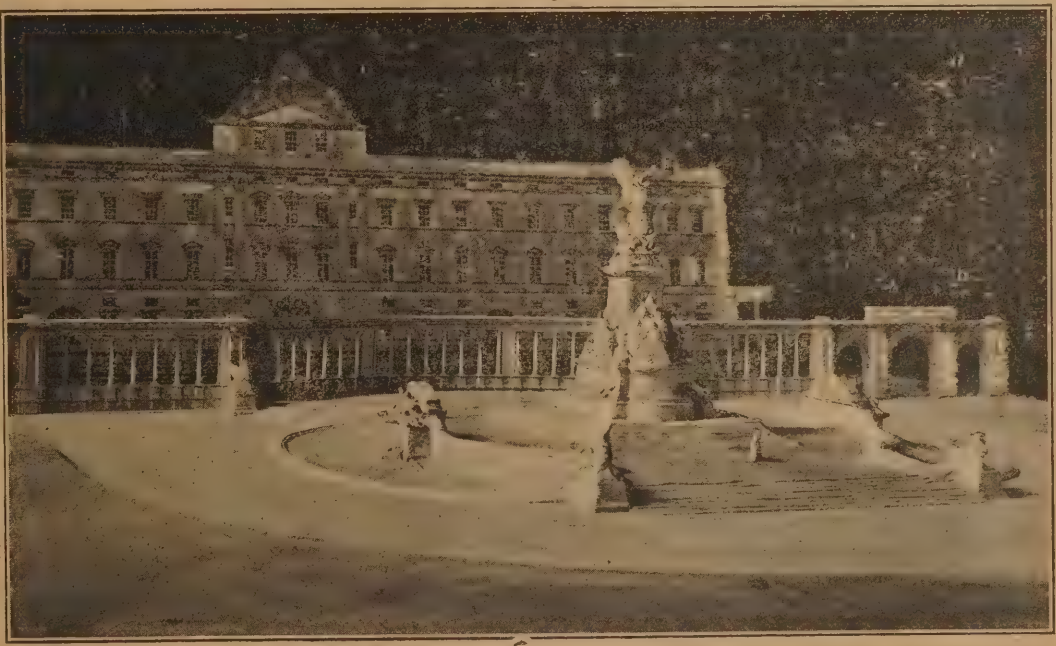
The Victoria Memorial Designs.

OF the five sets of designs for the National Memorial to Queen Victoria now exhibited in the banqueting-room at St. James's Palace, Mr. Aston Webb's is by far the most satisfactory. It is more monumental than the others, and its planning is clearer and more direct. As we publish illustrations of the scheme this week, it will serve no purpose to describe it at any length. Suffice it to say that the existing railings in front of Buckingham Palace are replaced by a stone or marble screen which forms the chord, so to speak, of a semicircular double colonnade of Ionic columns, the space thus enclosed measuring 800ft. by 450ft. and being called "The Queen's Garden." Mr. Brock's memorial occupies a central position in front of the screen, while a fountain is arranged at each side against the colonnade, the whole being made bright with beds of grass and flowers. Leading straight from this "garden" eastwards to Spring Gardens are a central processional drive and two carriage roads, the latter communicating respectively with the altered routes from Constitution Hill and Buckingham Palace Road. The Mall is thus entirely remodelled, and the processional drive made axially in line with the centre of the Palace. At each side of this roadway are plots of grass planted with trees and having sculptural arches set crosswise so that they may be seen to more advantage, while at the eastern end is a circus enclosing a central memorial of Queen Victoria as she was in 1837. From this circus a new road is formed axially in line with the West Strand, a most admirable arrangement. There is thus a monumental avenue leading from the Palace practically into Trafalgar Square. The Palace, moreover, is made more satisfactory by the addition of a central domed Mansard roof, and lower additions of the same kind at each end. Other details can be seen by examining the perspectives.



PLASTER MODEL OF THE NATIONAL MEMORIAL TO QUEEN VICTORIA. T. BROCK, R.A., SCULPTOR.

We may next refer to the remaining four designs. All provide for the remodelling of the Mall in much the same manner as Mr. Aston Webb, but only one of them (Sir Thomas Drew's) includes any alteration to the Palace front, which is a most imperative matter. According to this design, a pavilion block would be raised at each end, advanced from the building in order to cast shadows which would break the monotony of the elevation; and a Corinthian order would be applied, elevated on a rusticated or coursed basement, as an improvent on the present lowest storey. Sir Thomas Drew encloses a space in front of the Palace with the memorial in the centre, but his treatment is somewhat incoherent and the irregular arrangement of the roads from Constitutional Hill and Buckingham Palace Road is not pleasing; the best portion of this design is the treatment of the eastern end of the main avenues. Here are provided new offices for the County Council, which form a space 110ft. across called "Spring Gardens Court," closed at one end by a triple archway surmounted by a group of sculpture. The provision of semicircular places at the entrances of Marlborough and Clarence Gates hardly seems necessary. Mr. T. G. Jackson shows a squarely-treated colonnade in front of the Palace, closed by a line of State and royal gates. The colonnade has end and angle pavilions; but while the general treatment of these is very academic, the detail is not so good as it might be. Garden beds are arranged inside the colonnade, and groups of statuary emblematic of the Colonies are introduced. Mr. Jackson also has a series of statues on each side of the roadway leading to Trafalgar Square, and his archway at the eastern end is very pleasing. Mr. Ernest George puts the existing railways square with the Palace facade, but does not alter the roads from Constitution Hill and Buckingham Palace Road, which is a distinct fault in the design. The memorial he sets on an oblong platform approached by a flight of seven steps, with a fountain at each end having a large circular basin. This does not satisfy the eye, however, and the effect is not enhanced by the introduction of four electric standards. The central roadway in the Mall is made 120ft. wide, with an 80ft. carriage-way at each side. The royal entrance at Spring Gardens has three arches, the central one closed by gates and the other two left open. Opposite Marlborough Gate a possible future road is shown, with a bridge over the lake. Dr. Rowand Anderson's design is the most disappointing of the whole set. He puts a screen in front of the Palace, with the memorial at a distance of about 200ft. from it, enclosing a space like the rest, but instead of employing a colonnade he shows a low balustraded wall, which makes the whole scheme look cold and meagre. The main avenue is made 90ft. wide. Opposite Marlborough Gate is a recess containing a statue of Queen Elizabeth, and at Clarence Gate are statues of King Alfred and William the Conqueror, while a new roadway is shown opposite the Duke of York's column. These then are the designs, the general appearance of which can be gathered from the illustrations which we are able to publish this week. Of Mr. Brock's memorial itself one can say little more than what was said a short time ago when the small sketch model was exhibited at the Foreign Office—that it is likely to be very satisfactory when erected. The least pleasing portion of it is the figure of the late Queen herself, but the difficulty—almost insuperable—of successfully accomplishing such a task will be at once apparent. The memorial as a whole masses well, and its surroundings are excellently contrived. But it should not be forgotten that both the architect's and the sculptor's designs are far from complete and have already been altered considerably. This is evident, for example, in the two treatments of the main entrance to "The Queen's Garden," the perspective looking *towards* the Palace being the more recent of the two. Other alterations are also contemplated, such as the rearrangement of the walling next the lake. There is one question which at once suggests itself when inspecting the designs, or more especially Mr. Aston Webb's—where is the necessary money coming from? It seems to us that the major part of this memorial scheme needs to be completed by the present generation and not left to our successors who are not so closely connected with it, yet at the present moment the total sum of money contributed towards the cost does not amount to much more than £170,000; and when it is recollected that the Albert Memorial even—a disconnected single erection—cost £120,000, one wonders how the present scheme is to be carried out. Mr. Brock's memorial itself will eat up the bulk of the funds in hand at present, but the architectural scheme will cost a much greater sum. Consider the cost of remodelling the Mall and the Palace front alone, irrespective of a great colonnade and its appurtenances. One is of course familiar with the statement that it is not intended to complete the whole of the scheme at once, but if there is not sufficient money forthcoming to do more than a portion—even the memorial and the surrounding colonnade—it will be better to leave the scheme alone and adopt a less monumental one which can be carried out thoroughly. Mr. Aston Webb's design is, as we have said, the best of the five submitted, but that does not say it is the best possible; rather we hold to our original opinion that, with such an opportunity as this memorial affords, it would have been better to have held an open competition. It would undoubtedly have drawn a host of inferior designs, but there might have been a few of superlative merit; and not one of the five designs submitted can warrant such a description.

THE LONDON COUNTY COUNCIL AND THEATRES.

DISCUSSION AT THE O.P. CLUB.

On Wednesday evening last at the Criterion Restaurant, Piccadilly, under the auspices of the O.P. Club, a discussion took place on the position of the London County Council in regard to the safety of the theatres under their control. The chair was taken by Mr. Carl Hentschel.

In opening the discussion Mr. Edwin O. Sachs, the well-known architect, said:—

Firstly, as to the general technical aspect of theatre-safety as we find it to day, please note that, as far as the primary essentials of such protection are concerned, the world's experts are by no means agreed.

Theatre Fires.

We all know how many serious theatre fires we have had, the loss of life and the lists of injured. We also know, though perhaps we scarcely realise the frequency, how often there are smaller fires at theatres of which the public and even the authorities hear little. I am not going into detail, but, just to mention a few figures, let me say that there have been no fewer than about 400 fires since 1881, resulting in the total destruction of theatre-buildings. These include the great catastrophies at Vienna, Nice, Exeter and Paris. The number of lives lost since 1881 to my knowledge has been over 1,000. These figures are from some statistics which I have been recently collecting and dealing with more than 1,200 cases of total destruction and the loss of almost 10,000 lives. As to the smaller fires, I will only note that during the year I served with the Berlin Royal Police Fire Brigade there were as many as forty-three fires in the Berlin theatres, and this city is well equipped with fire-watches during the hours of performance.

Now, theatre fires have been almost identical in every country as regards the outbreak, spread and result. The serious theatre fire as such is generally too much for the local fire-brigade, and if there is any extensive life-saving necessary the means at the disposal of the authorities are usually quite inadequate to deal with such emergencies. Everywhere the theatre fire has shown us that a combative or fire-brigade policy alone to meet a fire when it actually occurs is of no avail. The results everywhere called for

Energetic "Preventive" Measures.

Nearly every country has inaugurated a preventive policy. The countries of Europe and the western hemisphere have every kind of legislation conceivable for the protection of the public. There has been hysterical panic legislation, ponderously-conceived regulations in which every detail is defined by law, legislation which leaves practically everything to the discretion of an executive of experts, to the discretion of single officials, or, on the other hand, to the discretion of lay committees; and there have been regulations which are merely so in name and are a farce, because they cannot be enforced. There is no uniformity in legislation for theatre-safety—not even in its elementary principles. If we read the regulations of the different countries consecutively, with an idea of discovering what is really necessary, the result is most confusing. Now, I am not going into detail. I shall not quote paragraph clauses, &c., but I will say broadly that *some* countries seem to consider good construction the essence of safety, whilst clear planning, watching or inspection are forgotten. Other countries give all attention to endless regular inspection, and omit the watching; others, again, require inspection only; others perhaps, again, good planning, construction and ample inspection, but no watching at all.

What is Needed.

Well, it is really time for some representative body of experts, officials, managers and business men to decide, as based upon the experience of the great cities of the world generally, what is really essential, and then to see to what extent the world's wisdom can be applied to the best advantage to Great Britain and our Metropolis in particular.

To my mind clear planning in a theatre is of greater importance to the audience than clever fire-resisting construction, and to my mind the regular attendance of reliable fire-watches day and night, and especially during the performances, is more essential than any amount of surprise-inspection: but these are only personal views.

Personally, as a playgoer, I like to know distinctly that there is a straightforward simple route of exit, easily accessible from the seat I am sitting on, and I like to know that there are really well-trained efficient men permanently in the theatre on the look-out for danger and ready to cope with an emergency.

Personally, I consider the order of precedence for theatre-safety to be: (1) Straightforward planning; (2) regular watching; (3) skilled inspection; and (4) good construction.

Exits.

The protection of life by means of rapid exit should always have the first place. As we all know how easily panic occurs without any fire and how dangerous the rush of a frightened audience can be, the clear exit of ample dimensions with the simplest route will be the safest, and perfect symmetry of plan of most value for finding that exit. Panic is best guarded against by the constant presence of experienced and responsible firemen, who will, on the one side, see the possibility of danger and prevent it, and, on the other side, be able to act smartly in case of an outbreak and give the audience confidence. I do not wish to disparage good construction or regular and surprise inspections, but I consider many regulations as to construction and equipment materially discounted if the planning is not straightforward and a responsible fire-watch is not regularly on duty.

I have been over many theatres built, according to modern regulations, of the best fire-resisting materials, and yet have found them dangerous in the extreme, through bad arrangement of staircases and passages. I know many important cities which, though equipped with modern regulations for the erection and maintenance of theatres, have no powers to enforce the presence of an official fire-watch during the performances, or, for that matter, any fire-watch at all.

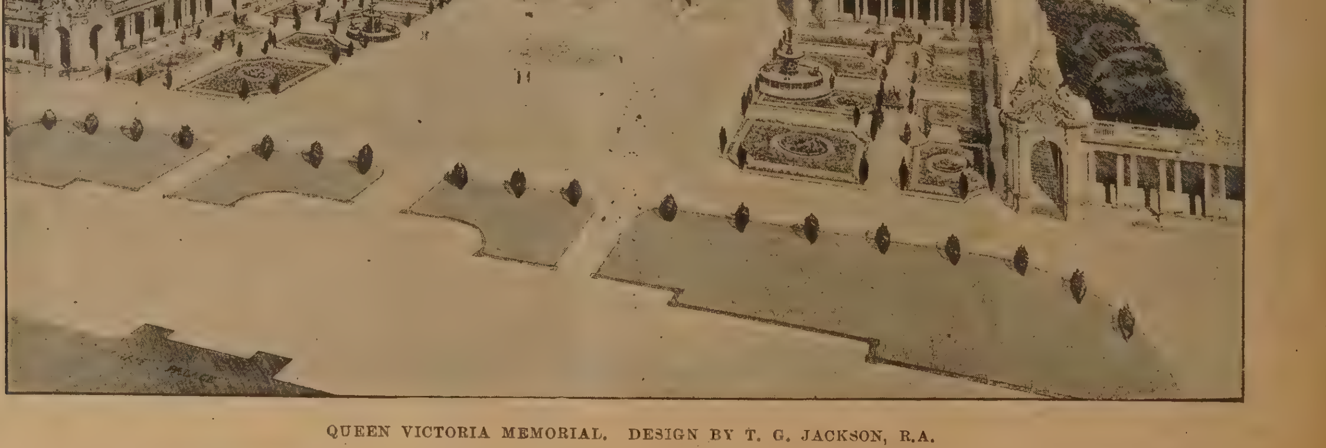
The New Regulations.

As to our latest London County Council theatre-regulations for new buildings, although they contain much that is extreme on the one hand, and neglect some points of vital importance on the other, they are in many respects model ones, and, speaking generally, both the playgoer and the aspiring theatre-builder can be well satisfied with them. They certainly somewhat fail the playgoer on the question of really straightforward planning, whilst the question of the fire-watch does not appear to be dealt with at all. But on the whole they will give us a better playhouse in the new century than we had in the old, without unduly taxing the theatre-owner of the future.

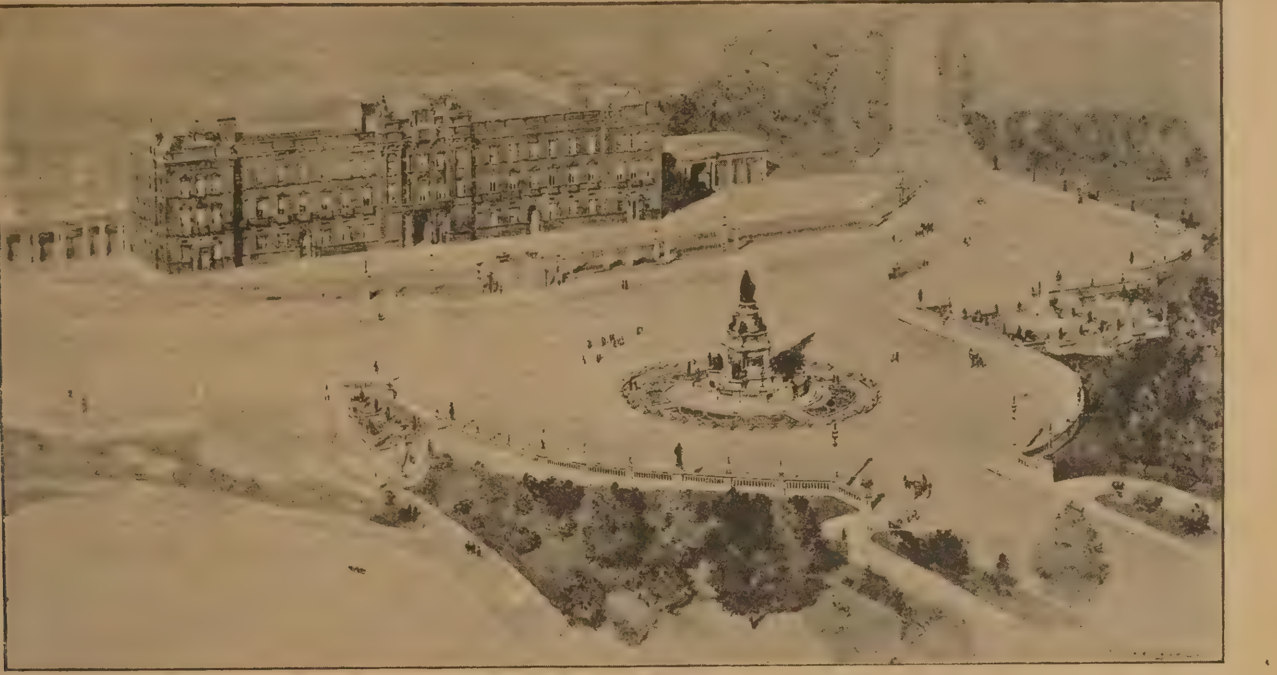
Theatre-Control.

And now for the second aspect of theatre-safety, namely, the question of the powers that be, of control generally, and of the London County Council in particular.

In the first place, I think we must all grant



QUEEN VICTORIA MEMORIAL. DESIGN BY T. G. JACKSON, R.A.



QUEEN VICTORIA MEMORIAL. DESIGN BY R. ROWAND ANDERSON, LL.D.

that the safety of the London theatre has improved materially from the playgoer's point of view since the London County Council was created. Although we have often heard the theatre-manager complain, more particularly in respect to old existing buildings which he has been required to alter, I must say that, as a class, the theatre-managers as I have met them are only too anxious to attend to the safety of the public, and that there has really never been any great difference of opinion between managers and the London County Council on the general question that the safety of the public must be attended to by some public authority.

Alterations to Old Theatres.

There is, however, one grave fault to find with the present state of affairs in London under the auspices of the London County Council, and that is the method by which safety is obtained in old theatres. I am afraid that, owing to the London County Council not being vested with sufficient authority to deal once and for all with the question of safety in existing old theatres, the theatre-managers have justly the very great grievance that they are constantly being worried and troubled by the authorities, and that they can obtain no finality as to what has to be done to bring their houses up to a certain standard of security.

It is this policy of worrying the managers of old theatres for improvements from time to time that has of late made that body so unpopular in the theatrical world; but there has also been the standing grievance that the policy of the Council on technical requirements varies every few years, and that improvements that may have been ordered in one year are not considered desirable in the next, the result being that the officials of the Council are blamed for not being consequential.

Personally, I think there would not be half so much cause of complaint with the London County Council's administration if its powers had been greater in the first place and, secondly, if greater discretion had been left to its chief permanent officials, and more particularly to the official holding the post of superintending architect, an official who is so often the arbiter of grave technical questions under the general Building Act, and certainly holds the full confidence of the technical professions. I am convinced that if our local authorities after the theatre catastrophes of 1881 and 1887 had had the necessary powers, had boldly acted upon them, and had insisted upon as many improvements as were possible in the various theatres, allowing, in the first place, the theatre-owner a certain number of years to carry out the improvement, and, secondly, guaranteeing him finality in the decision, the managers of theatres existing at the time would have willingly assisted the authorities in bringing their buildings up to modern requirements, whilst those erecting new theatres would have arranged their financial programme to meet modern requirements.

A Central Control by Government.

Sooner or later the London County Council, the theatre-managers and the public will appreciate that it will be in the interests of the community at large for the whole licensing question, whether relating specifically to theatres, music-halls, or other places of public amusement, to be subject to the central control by a Crown or Government authority. Whether, given a central authority, this central authority should delegate certain of its powers to the London County Council, the provincial county councils, or other local authorities, on lines not dissimilar to the administration of the Factory Act; or whether the central authority should take direct control, as often exercised by the Board of Trade in other departments of public life, is a matter for consideration, but one thing is absolutely certain, that the principles, methods and powers of control require revision and bringing into line for the whole of the United Kingdom, and, I may say, the Empire. Other countries have already found it necessary to adopt the principle of a controlling centre, and the experience already gained in that direction has been highly satisfactory.

You are, of course, aware that Select Committees of the House of Commons have sat upon this subject of control in 1866 and in 1892, when much valuable information was gathered but very little practical improvement or reform came.

A Suggestion.

Bearing in mind what I said earlier in the evening concerning the necessary investigation of the actual essentials of theatre safety, I venture to tender with all due respect the proposal that the Lord Chamberlain, who has always enjoyed so much confidence, should appoint a special commission, which, after due personal inspection of existing theatres both at home and abroad, and due examination of the rules and regulations in Great Britain, in the colonies, and in foreign countries, should draft some practical scheme by which the essentials of theatre-safety might be obtained and some practical scheme for control and administration be formulated. Such an independent commission should comprise at least an architect, a surveyor, an engineer, a fire-expert, a lawyer, a business man, a theatre-manager and an actor. Such commissions have been created, both in the United States and on the Continent, after great theatre catastrophes, and have done excellent work.

I think, gentlemen, it would be better to have this investigation taken in hand immediately, without waiting for a repetition of the Exeter theatre fire or the repetition of some other great catastrophe. I am convinced that such a commission could do more for the subject than any further Parliamentary committees, and that the reference to this commission should simply be: (1) What are the essential requirements for theatre-safety? (2) What system of control would meet the requirements of the United Kingdom and the Metropolis in particular?

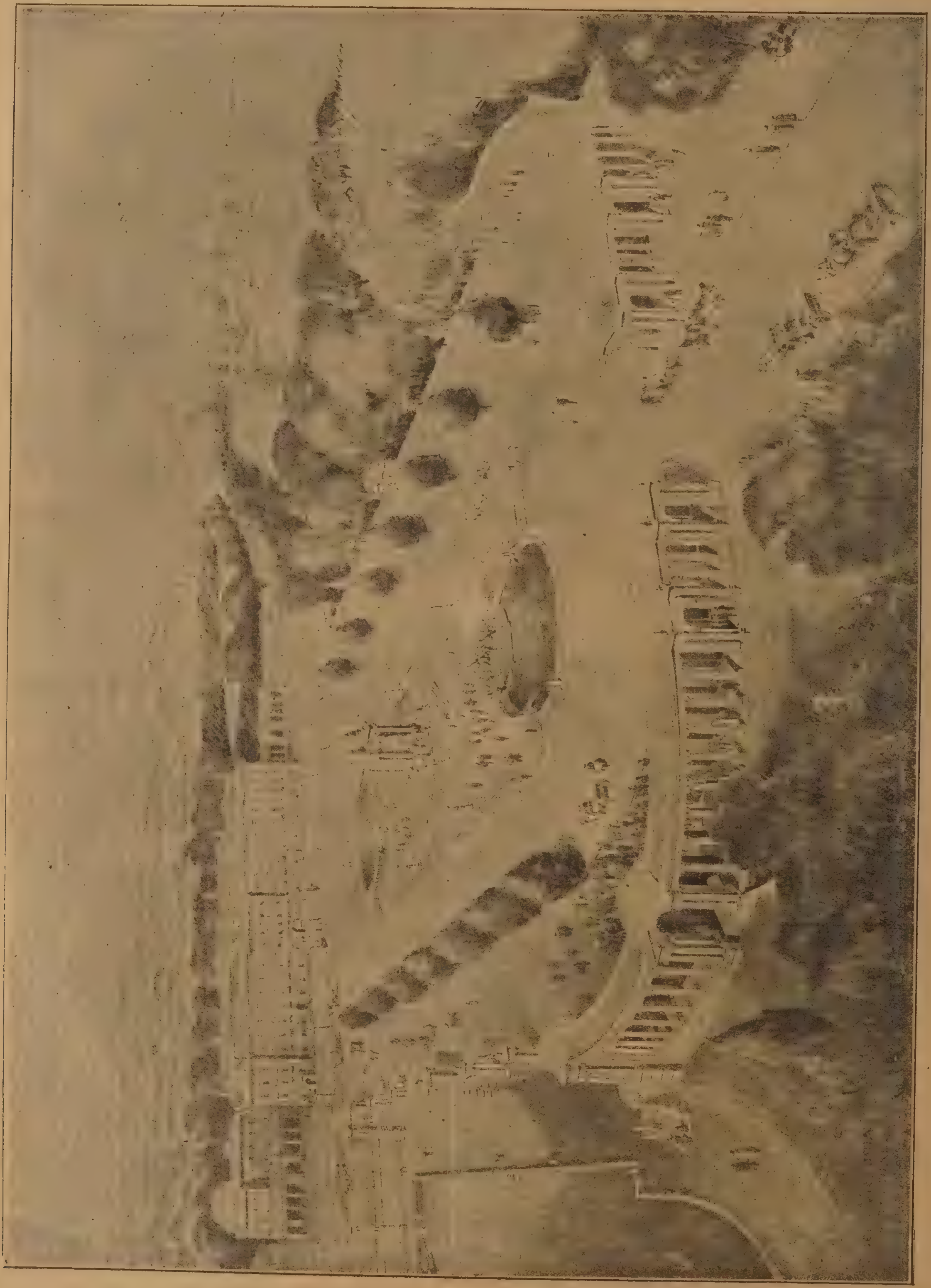
The discussion which followed added little of value. The chairman said he had written to numerous theatre-managers, and the majority of those who replied expressed the opinion that it would be better if the entire control of theatres were vested in the Lord Chamberlain. One only, Mrs. Langtry, preferred the London County Council; and she also thought the moral support of a fireproof curtain was immense. She had been in three bad theatrical fires in America, and in one case, in Oswego, New York, the theatre was burnt down in fifteen minutes, and the people displayed absolute calmness. Mr. Leven Sharp, L.C.C., the architect of the new Apollo Theatre, thought the County Council regulations were model ones and that it was the Council that was the only reasonable controlling authority, for an elective body was better than a Government one. A building built in conformity with the London County Council's regulations was as safe as any on the Continent. Major Fox, of the Salvage Corps, said constant inspection was the life and soul of safety. He thought there should be uniform regulations for the whole country. During the last six years no loss of life had occurred in London theatres, tending to show that the London County Council's regulations had proved effective. Mr. John Colman thought that every theatre ought always to be built with an open space on all sides. He considered that the County Council was the proper body to exercise control.

Queen Victoria Memorial.—Tickets of admission to St. James's Palace can only be obtained at the entrance in Colour Court during the hours the exhibition is open to the public, namely, 10 a.m. to 4 p.m.

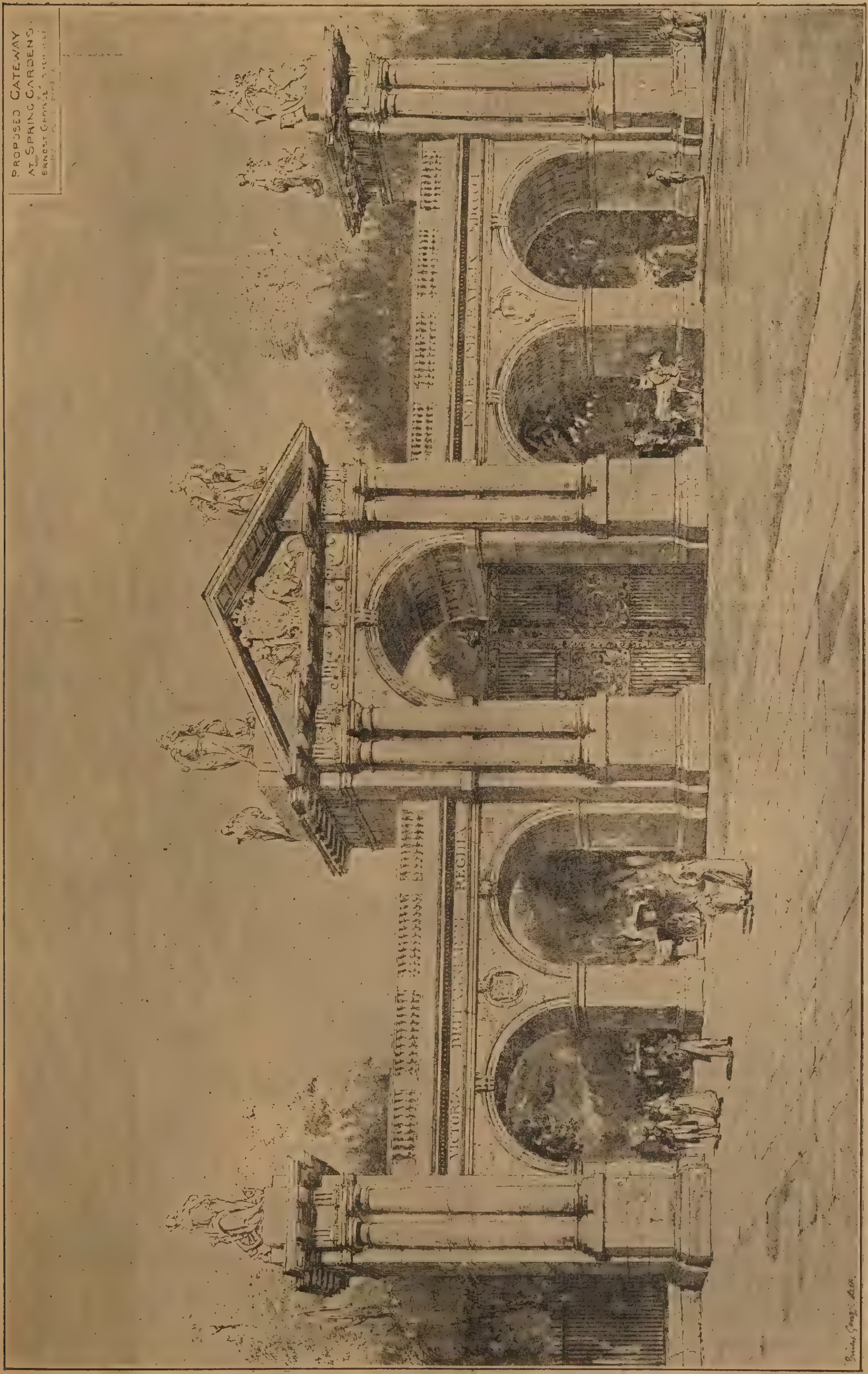
An American Lady Architect.—The American girl has entered the profession of architecture in France. Miss Julia Morgan, who belongs to San Francisco, has just won honours in the architects' section at the examination of the French Academy of Fine Arts. She means to practise her profession.

ST. JOHN'S CHURCH, LINCOLN.

ST. JOHN THE BAPTIST Church Lincoln, was re-opened recently after restoration. The church was, as far as possible, restored in the year 1856, at a cost of £600. Since 1898 a great deal has been done to brighten the interior of the edifice. In the last year named a dry area was formed on the north and east sides, and in the following year the south porch, with stepway and entrance from St. John's Street, was completed, while other improvements were carried out at the same time in the way of the rearrangement of the font and seats, curtains, gas lamps outside, &c. This year another important step was taken, and a contract was entered into for a thorough restoration of the chancel roof and for the removal of paint and colour from the walls. It was then found that the rafters and main timbers were much decayed, and the stonework of windows and arches was found to be so mutilated as to necessitate complete renewal in places. It was decided that the opportunity should be taken for cleaning the whole body of the church in the same manner and at the same time as that of the chancel. A close examination of the roof revealed the same serious state of decay in the north and south aisles as that found in the chancel. The south aisle roof from end to end has been made secure by means of new oak plates and stone corbels in connection with the clearstory wall, and some of its architectural features have been restored. The same necessity for repair was found at the east end of the north aisle, and it has received similar attention. The wall surfaces have been divested of all extraneous colouring and paint, showing up the moulded and Ashlar face stonework. The walls were not re-pointed but re-plastered. The chancel roof's architectural features have been restored, and the solid oakwork thereof gilded and painted. The sham stucco-work of the walls has given place to stonework following the lines of the ancient construction of windows, jambs and arches. The floor-levels and steps of the sacrarium have been readjusted, and the opportunity has been taken of laying a new floor in Rust's virtreous mosaic work with half-polished texture. Two new gas pendants supplied by Messrs. Elgood Brothers, of Leicester, have taken the place of the old wall brackets and are of design of the Georgian period. The general gasfitting of the church has been set in order by Mr. G. Bacon. The dossal hangings and side curtains were supplied and fitted up by Messrs. Jarvis & Co., of Stamford. The general builder's work has been carried out by Messrs. Roberts Brothers, under the direction of Mr. J. C. Traylen, architect, the surveyor for the diocese of Lincoln. The cost of the work is estimated at about £350.



QUEEN VICTORIA MEMORIAL. DESIGN BY ERNEST GEORGE.



QUEEN VICTORIA MEMORIAL. DESIGN BY ERNEST GEORGE.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"It cannot be imagined that either the back streets of our manufacturing towns, or the designs of our suburban villas, are things which the angels desire to look into; . . . . . but we should at least possess as much unconscious art as the lower brutes, and build nests which shall be, for ourselves, entirely convenient, and may perhaps in the eyes of superior beings appear more beautiful than to our own."—RUSKIN.

Grounds for Painting. PROFESSOR CHURCH, F.R.S., recently delivered a lecture at the Royal Academy on "Grounds for Painting." He dealt with the qualities and composition of paper, plaster for fresco-painting, canvas, panels and priming. Speaking of papers for water-colour painting the Professor dwelt on the great superiority of those made from linen. He said that in a linen-made paper the hardness of the flax fibre made it easy for the artist to cut out a high light, and if it were necessary to paint over it again the colour would take well on the damaged surface. Yet, in spite of the superiority of linen, cotton was the basis of nearly all the drawing-papers of commerce, and Professor Church made the somewhat surprising statement that only one paper was made of linen. Turning to plaster grounds, he stated that impure sand caused more trouble than anything else, and gave a simple test that would enable the fresco painter to detect the presence of salt in sand.

Another Cretan Palace. FURTHER reports have now been received about the important discovery by Italian archæologists of another royal palace in Crete, at Phaistos. The palace is of the Mycenæan period, or about 1500 B.C., and its ruins are in many respects even more interesting than those discovered at Knossos last year by English archæologists. The ruins of the palace are situated two hours' journey from the ancient town of Gortys, known as containing the longest Greek inscription extant. It is built on the spur of a high mountain chain, a site characteristic of nearly all the Mycenæan fortresses. Two parts of the excavated palace are of special importance. One is a large enclosure, on one side of which is a terrace wall and on the other a flight of stairs. As these stairs end in a closed wall, it is supposed that they must have been intended for the accommodation of spectators witnessing processions and dramatic representations on the space below. Here, therefore, we may have an example of the oldest Greek theatre. A small building, consisting of two low chambers, with benches along the walls, is connected with the enclosure, and from the chambers the way leads through two corridors to a large square, beyond which is a staircase from thirteen to fourteen mètres wide, and then through an *atrium* into a large hall, supposed to be the Megaron, or throne-room of the monarch. Two doors open into the hall, the ceiling of which is supported by three huge wooden pillars. Leaving this hall one enters other corridors, and then up more stairs, a second hall, with four pillars, which is thought to have been the women's room. The numerous corridors and stairs at Phaistos are especially noticeable. So far, fewer remains have been discovered than at Knossos. The palace seems to have been looted at some earlier date, but enough has been found to show that the excavations are exceedingly instructive. But only a portion of the palace has been uncovered, and it is therefore possible that future researches may bring unexpected treasures to light.

A Village Memorial. A MONUMENT at Eamont Bridge has been erected to the two men from the village who were killed at the action of Fabers Put, May 30th, 1900. The memorial to the men—Privates John Hindson and William Todd—has been erected on the site known as Arthur's Round Table, and is in the angle of the roads leading to Penrith, Shap and Ullswater. It consists of two chamfered bases, with a tapering die supporting the plinth, which is surmounted by a Celtic cross. In the face of the shaft of the cross are bronze portraits in alto-relief of the fallen yeomen, and in the upper part is a panel of intricate interlaced work, after the style of the Runic knot. This is also continued round the wheel of the cross. There are four bosses, standing 4½in. from the face of the upper part of the cross, finely carved. The carved panels and the portraits are divided by a beading. The back and sides are plain. The memorial rises to a height of 12ft., and stands on a base 4ft. 2½in. by 4ft. 9½in. It is surrounded by substantial iron rails, supported by four massive corner posts. The work has been executed in Silurian green Elterwater stone, quarried about two miles from Langdale Pike, Ambleside. The cross was hewn in one block, which is the largest that has yet been quarried at Elterwater. It measured in the rough 13ft. by 3ft. 6in. by 1ft. 6in. The monument was designed by Mr. W. Grant Stephenson, R.S.A., Edinburgh, who modelled and cast the bronze portraits. The remainder of the work was entirely carried out by Mr. W. Grisenthwaite at his monumental works, Penrith, under the supervision of Mr. G. Monk.

Truro Cathedral. THE cracking of the Bath-stone bases of the piers of the nave now being built does not appear so serious as at first stated. Precentor Donaldson, one of the committee secretaries, says that it is absurd to describe the cathedral or any part of it as unstable. Since the cracks were first noticed, in June, they have not spread in any way, and they are so slight that only experts would notice them. The architect, the contractor and the clerk of the works are unanimous in their opinion that the foundations are perfectly secure. There are no cracks in the arches of the nave or clearstory, or other signs of settlement in the building, and the cracks are almost entirely confined to the bases of several pillars. The cause of the cracks has not yet been arrived at definitely. The architect thinks they were caused by the plinth stones resting on an uneven surface. An expert will be called in by the architect and another by the committee, and they will make an investigation in conjunction with the architect, the contractor and the committee. When the experts report, the great question the committee will have to consider is whether it is necessary to remove the bases and put in others. It would be a somewhat difficult operation to shore up the weight above while that was being done, but that may not be necessary. It may be found that the cracks are due to something purely local to those particular pieces of stone, and that the whole thing means nothing more than that the appearance, to an experienced eye, will be somewhat spoilt. There is no sign whatever of the stability of the building being in danger.

Sir William Richmond on Church-Decoration. AT the Hammersmith Town Hall last week a lecture on church-decoration was delivered by Sir William Richmond, R.A. The proceeds of the lecture went towards the fund for beautifying St. Peter's Church. Observing at the outset that the divorcing of colour from architecture and sculpture had been a comparatively recent event—occurring, roughly speaking, 250 years ago, when what was called the revival of the Classic style, but which might be more truly named the sham Classic style, took place—Sir W. Richmond put forward a plea for the restoration of colour in church-decoration. He said the sham style was one cause of the divorcing of colour from architecture. England was rich in her painted churches, Saxon, Norman and others, right up to the sixteenth century. He instanced a number of cathedrals and churches in England where traces of colouring still remained. He believed that art and its services to religion would be revived in this country, although not on the same lines as formerly. It would come when all desired that the highest form of beauty should be connected with worship as well as with the buildings set apart for that purpose. It was said that costly decorations in churches were at variance with the simplicity of Protestant worship. The Puritans of former days, and many now, considered that nothing but the inward mind should be cultivated, that all outer aids to faith were obstruction and follies. They had the authority and example of the Primitive Christian Church, which the Puritans pretended to copy, to sanction the most costly and elaborate structures and the decoration of them for the service of religion. The best should have the best given to it. And what better could man give to religion than his art, his industry, his genius, indeed, all that the Divine Creator had implanted in him—his intellect and his skill?

Masters and Men.

The Strike of Swansea Builders' Labourers, which has lasted for twenty-seven weeks and has cost the Gasworkers and General Labourers' Union £2,400 in strike-pay, came to an end last Wednesday, the men looking for work unconditionally.

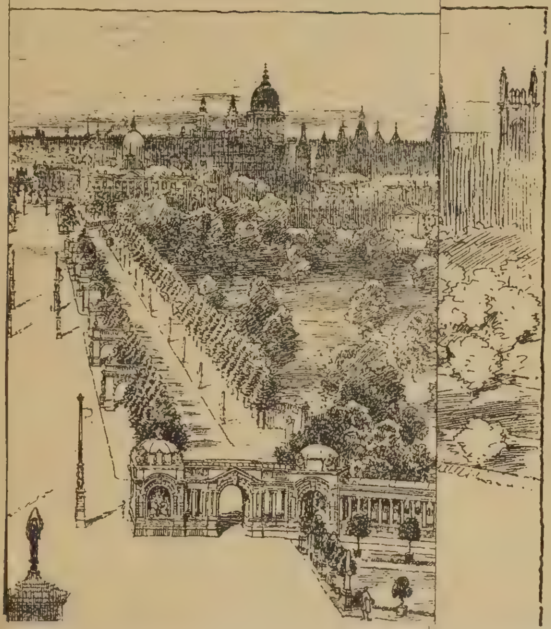
The Decline in the Building Trade of the country generally, which is attributed to the effect of the war and the continued high price of materials and labour, has caused several of the leading associations connected with the National Federation of Building Trade Employers to give notices to the workmen of a reduction of wages. At Birmingham the trade union representatives of the carpenters and joiners, masons, bricklayers, plasterers and labourers have been notified of a reduction to come into operation next year. The employers also assert that in order that the trade may be revived and kept in as prosperous a condition as possible, certain rules, uniform in terms, should be introduced into all trades connected with the industry. Meetings of the operatives are to be held immediately to consider the employers' proposals.

Engineering Notes.

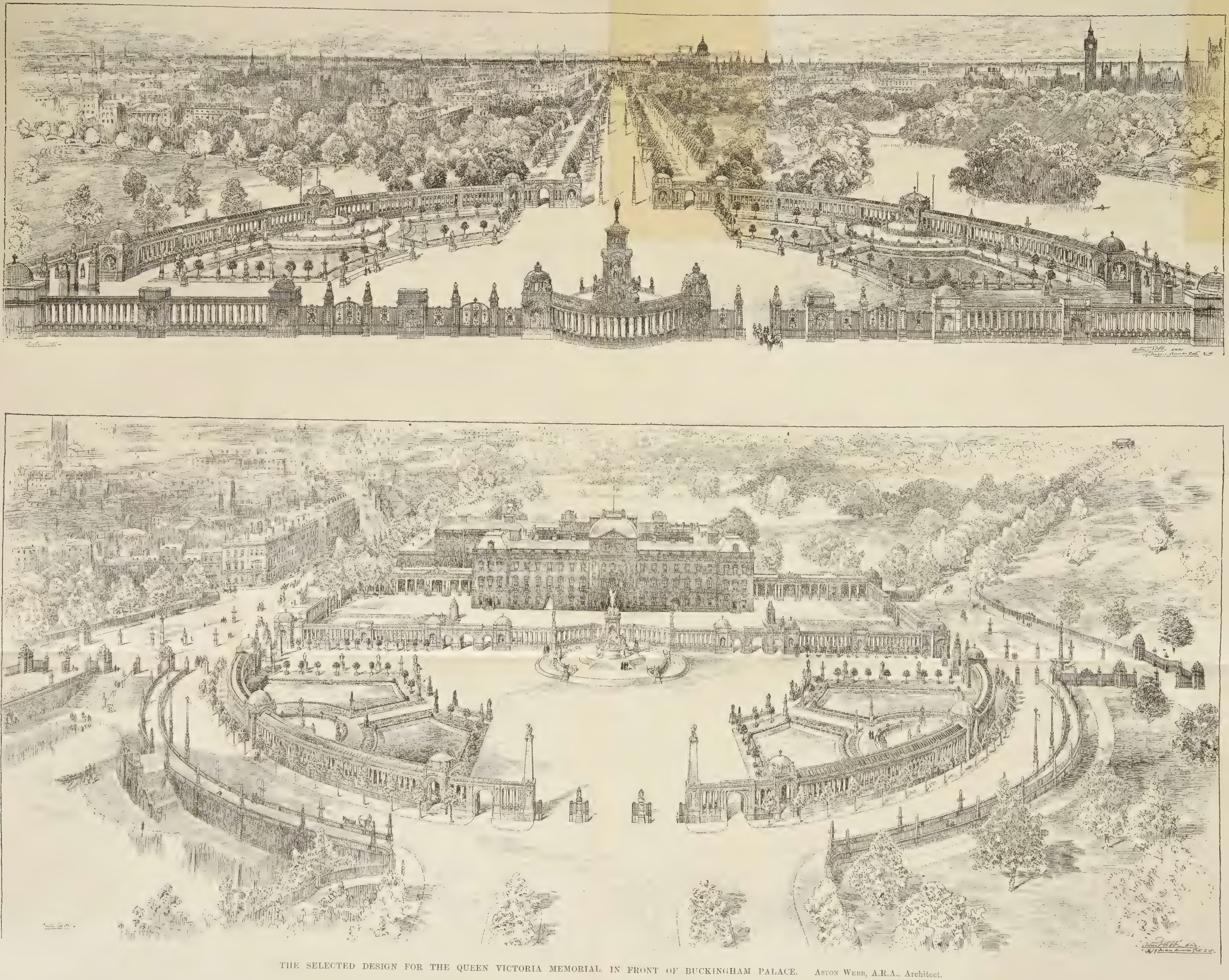
The Dryslwyn Bridge over the Towy was opened recently by the Countess Cawdor. It has been erected at a total cost of £12,000. The bridge is 17ft. wide, and built of limestone from Castellgarreg, Maesybont.

The Electric Light in St. Paul's.—It has transpired that the whole of the cost of placing an electric light installation in the interior of St. Paul's Cathedral in substitution for the present gas installation has been undertaken by Mr. Pierpont Morgan, and it will cost about £9,000. The light will probably be switched on for the first time in February next.

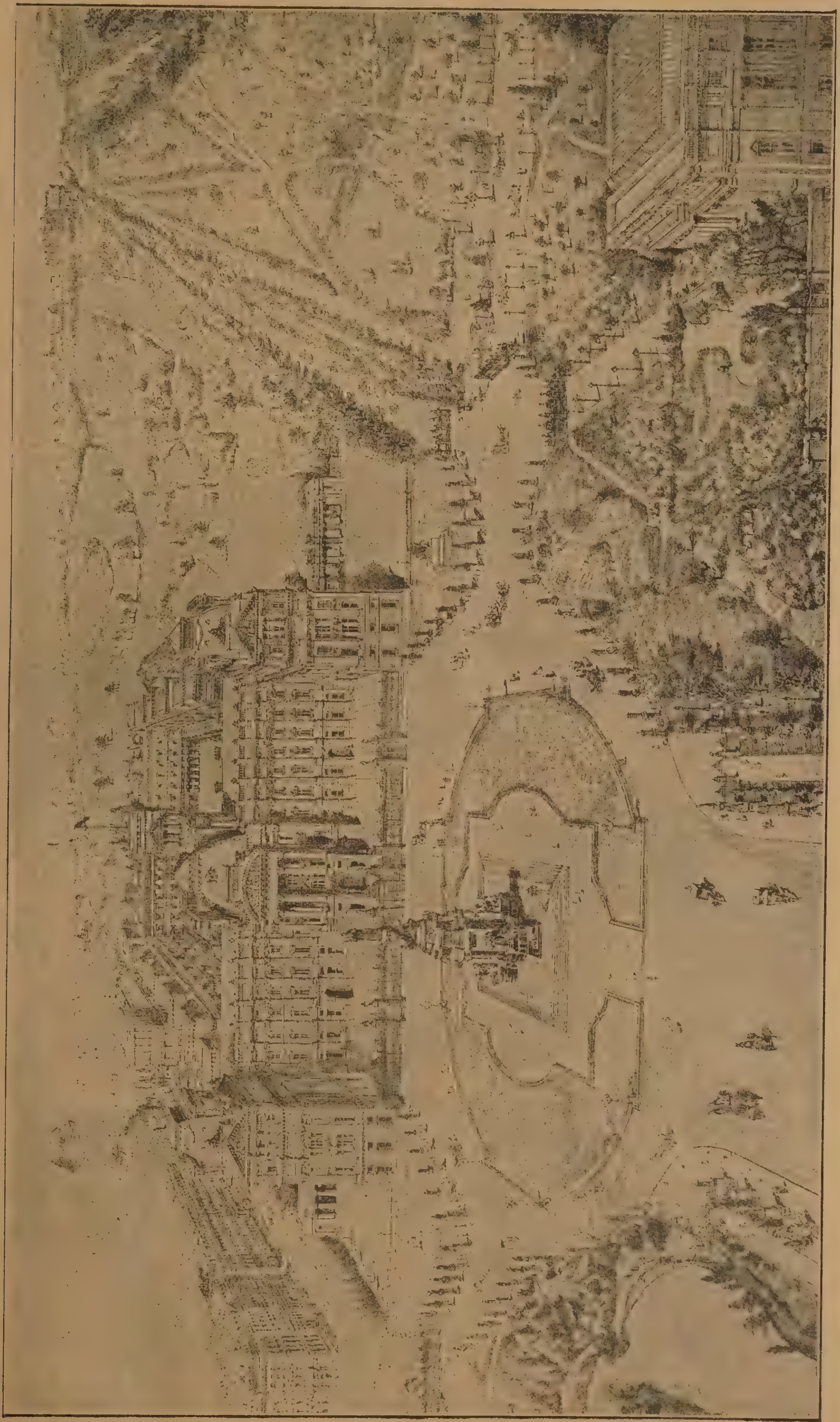
A New Shank Bridge in Mid-Lothian on Arniston roadway has been erected at a cost of over £9,000. Messrs. Alexander Findlay & Co., Ltd., Motherwell, were the contractors for the work; but the removal of the old bridge and the masonry of the new one were carried out by Mr. Stephen Hair, of Dalkeith; and the tar-macadam and paving were done by Messrs. W. Walker & Sons, of Ayr and Leith. Messrs. Crouch & Hogg, Glasgow, prepared the plans for the new bridge. It was found that the piers of the old bridge, which are very massive, could be repaired, and it was therefore decided only to take down the arches to the springing level and to erect braced stools upon them for carrying the girders. These stools are about 28ft. high, and are formed of four rectangular columns braced together and bolted to granite-bearing stones built into the piers, which have been thoroughly repaired. A bearing girder is fixed on the top of each stool, on which the longitudinal girders rest. The superstructure consists of two longitudinal plate girders, on the top of which trough floorings laid, and there is a lattice parapet on each side. Cement concrete is laid in and over this troughing, and the roadway is formed of tar-macadam, with tar paving on the footway. Cast-iron pilasters are placed over each pier, and castellated masonry pilasters on the abutments at either end of the bridge. The spans of the girders are about 47ft., and the width of the bridge is 28ft. between the parapets, divided into a roadway 20ft wide, with a footpath on one side 6ft. wide and a recess of 2ft. on the other side. The total length of the new bridge is about 320ft., and the roadway is upwards of 60ft. above the channel of the Gore Water.



Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, November 6th, 1901.



THE SELECTED DESIGN FOR THE QUEEN VICTORIA MEMORIAL IN FRONT OF BUCKINGHAM PALACE. ASTON WEBB, A.R.A., Architect.



QUEEN VICTORIA MEMORIAL. DESIGN BY SIR THOMAS DREW, P.R.H.A.

Builders' Notes.

Mr. Richard Wyatt Skinner, of the firm of R. W. & J. Skinner, of Sidmouth, died recently.

Mr. John Inglis, joiner, of the firm of Messrs. A. Inglis & Sons, of Hawick and Jedburgh, died recently.

Mr. James Gowans Duncan, builder, died at his residence in Craigie recently at the age of seventy-two years.

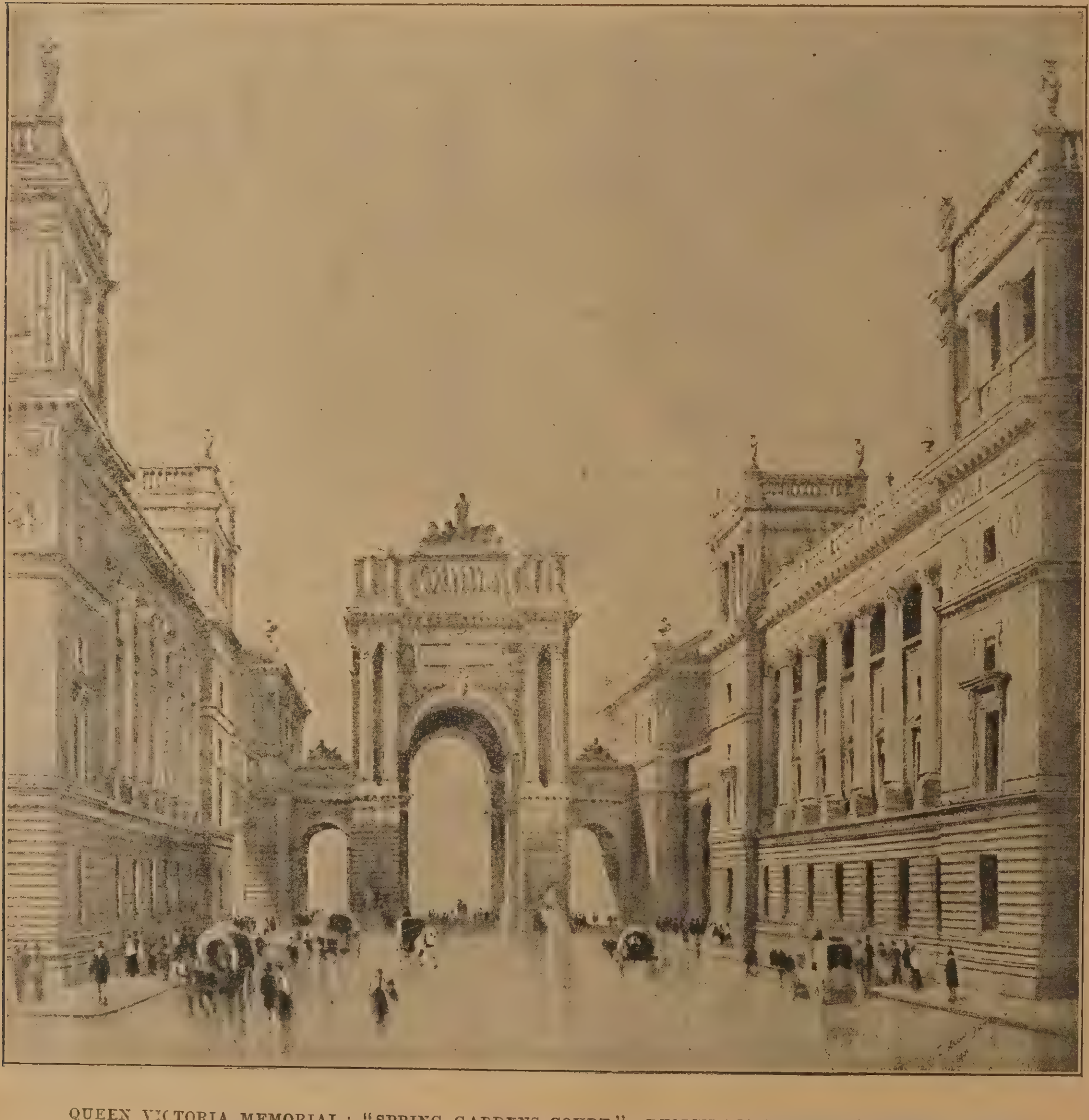
Mr. John Dow, junior partner of the firm of Messrs. William Dow & Sons, joiners, died recently. For some time past deceased practically managed the whole of the business.

Rochdale Building By-laws.—The building committee of the Rochdale Corporation has received a deputation from the Rochdale Housing Association, who have recommended that foundations of new houses be made more sanitary and the walls rendered damp-proof. They suggest that the ground surface should be asphalted. The building committee of the Rochdale Corporation promised to consider the subject at a future meeting.

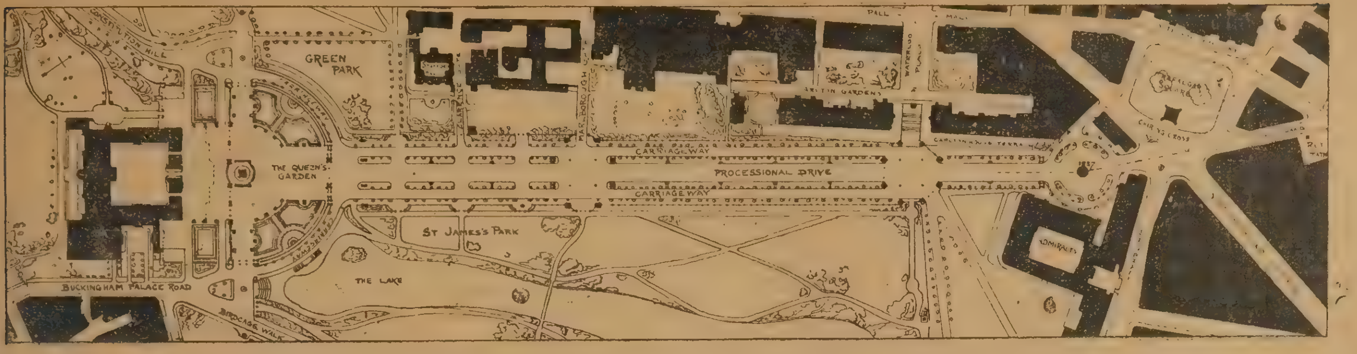
The Building Trade in many parts of Cheshire just now is at a standstill. Very little building has been going on during the summer, particularly in places where a remarkable growth had been witnessed, and at the present time there is absolutely nothing doing. Large numbers of joiners and labourers are idle, and builders complain that it is the quietest time known. A contractor in a large way declares that very little building was coming on, and that the outlook for the winter was an unpleasant one.

London County Council.—At last week's meeting a report was submitted by the General Purposes Committee, who had considered the applications for the appointment of chief engineer and county surveyor. From the thirty candidates they selected the following three to bring before the Council: Mr. Charles Elwin, general and Parliamentary assistant in the engineer's department of the Council; Mr. Maurice Fitzmaurice, chief engineer of the Assouan Nile Reservoir, and formerly resident engineer for the Council on the Blackwall Tunnel; and Mr. E. G. Mawbey, engineer and surveyor, of the county borough of Leicester. They recommended that Mr. Fitzmaurice be appointed to the post at a salary of £2,000 a year. This was agreed to. Mr. Fitzmaurice, it may be mentioned, served for eight years under Sir Benjamin Baker on the Forth Bridge. He has written two books, on bridges and bridge-work and on tunnelling.—The Housing of the Working Classes Committee reported King Street and Providence Place, Poplar, as insanitary areas, and recommended that these places should be cleared at a nett cost of £17,100. The estimated value of the cleared areas would be £1,500. Alderman Beachcroft moved an amendment referring the matter back to the committee for further consideration, but this was rejected and the recommendation approved.—On the recommendation of the Parks Committee it was resolved that the Council should contribute three-fourths (£30,000) of the cost of the proposed acquisition and laying-out of the land at Southfields, Fulham, for the purposes of a public open space.—Mr. A. Smith asked whether the City Corporation had asked the County Council to contribute half the cost of the proposed widening of Leadenhall Street, the estimated expenditure upon which was £360,000. Mr. Davies said a proposal had been submitted to the Improvements Committee from the City Corporation. A respectful reply had been made, and the valuer had been authorized to report upon the scheme.—The report of the Water Committee, proposing to introduce another Purchase Bill into Parliament on the same lines as that of last session, stood over for a week as the scheme involved an expenditure of more than £5,000.

The Teak Trade of Northern Siam.—The British capital invested in the teak forests of Northern Siam is about two millions sterling, and three-fifths of the total teak trade of the country is in British hands, the bulk of the remainder belonging to Chinese and Siamese. British foresters and British companies were the pioneers of the trade, and those now concerned in it have lately been caused some anxiety by a change in the old conditions and the concentration of the forest administration as well as the establishment of new rules by the authorities at Bangkok. There are two main channels for the trade, one down the Salwin to Moulmein, the other by the Me-nam and its tributaries to Bangkok. The timber floated down by the former, where the rains are plentiful and the valley deep, and reaches its destination in a month or two; by the Me-nam Valley the time taken is often more than a year. Nevertheless, the trade by the Salwin, according to the last report of the British Consul at Chieng-mai (Zimmé), has steadily decreased in the last three years, probably because of the indiscriminate felling of the Burmese and Shan foresters prior to the new leases of 1897, since which time the work of extraction has been restricted and controlled. On the Me-nam side there was a large and well-distributed rainfall, which floated out of the streams a large number of logs (as the stripped trunks are called) which had accumulated for years awaiting a favourable floating season, so that 120,000 full sized logs, valued at about £3 a log, reached Bangkok, the largest number in any previous year having been 73,000 in 1893. These logs having thus got beyond the boundaries of the forests, escaped confiscation under the provision that timber lying within the boundaries on the expiration of the lease becomes the lessor's property, and this gave great relief to the British companies and traders engaged in the staple industry of Northern Siam, who would otherwise have suffered heavy losses. But, on the whole, under the new leases and the new regulations for forest conservancy, the Council's opinion is that if the regulations are enforced with impartiality against all concerned, "British foresters and traders are entitled to anticipate, if not the same profits as heretofore, at least a maintenance in the future of the same proportion of the teak trade in their hands as in the past." Last year the value of the teak sent down the Salwin to Burma was over £75,000, that sent down the Me-nam and its tributaries about £350,000.



QUEEN VICTORIA MEMORIAL: "SPRING GARDENS COURT." DESIGN BY SIR THOMAS DREW, P.R.H.A.



PLAN OF THE ACCEPTED DESIGN FOR THE QUEEN VICTORIA MEMORIAL. ASTON WEBB, A.R.A., ARCHITECT.

THE CHURCHES AND COLLEGES OF CAMBRIDGE.

BY ALEXANDER WOOD, M.A., F.S.A.

A MEETING of the Architectural Association was held at 9, Conduit Street, W., on Friday evening last, the chair being taken by the president, Mr. Howard Seth-Smith. After the minutes of the last meeting had been read and confirmed, the chairman announced that it was proposed to nominate Mr. R. H. Weymouth to fill the vacancy on the committee created by Mr. Arthur T. Bolton's resignation prior to his appointment as headmaster of the Day School. The following were then elected members of the Association: A. Cecil M. Edwards (Rickmansworth), Edward F. Knight (London, E.C.), W. H. Hillyer (London, S.E.), H. Bailey (Anerley), J. H. Gott (London, S.W.), A. G. Parker (London, N.W.), H. L. Samson (London, S.W.), B. B. Hooper (London, S.W.), W. J. Parker (London, W.C.), J. H. Belfrage (London, W.), C. J. Calder (London, S.W.), J. C. Corblet (London, S.W.), J. H. Crabtree (London, N.E.), J. J. Crowe, junr. (Brentwood), L. H. Harrington (Bromley), A. J. Healey (London, N.W.), D. S. Jennings (Hammersmith), H. A. P. Pierce (London, E.C.), L. Roberts (Wimbledon), S. H. Stock (London, S.E.), F. A. Stowell (Pirbright), T. J. Tatham (London, N.), T. Thorne (Brockley, S.E.), G. F. Webb (Chislehurst), H. D. Aubrey (Chelmsford), A. B. Botterill (Streatham S.W.), W. B. Sinclair (Bexley), E. Chaplin (London, S.W.), R. B. Curwen (Woodford), M. E. Dixon (Wimbledon), J. V. Gibberd (Croydon), N. Hall (Walthamstow), C. R. G. Harrison (London, N.W.), C. McJerrow (London, N.W.), H. Kemp (New Malden), C. W. Kilner (London, W.), D. M. O'Connor (Southall), A. E. S. Payne (New Cross), P. Phipps (London, W.), G. A. Potts (Brixton Hill, S.W.), F. G. Russell (Tottenham, N.), S. M. Spoor (East Putney), E. G. Stevenson (West Norwood, S.E.), R. W. Suttle (Stepney, E.), W. J. Tomlinson (Pietermaritzburg, Natal), W. I. Travers (London, W.), C. F. Ward (Highgate, N.), R. H. Willson (Kingston-on-Thames), B. H. Sutton (London, W.C.).

Mr. Alexander Wood then read his paper on "Early and Mediæval Cambridge." He said:—

Early Cambridge.

About three miles from Cambridge the Gogmagog Hills rise above the surrounding country. From them a good view may be obtained over the plateau upon which the town stands. At this spot we are amid the defences which the East Anglians raised or utilised against their encroaching neighbour Mercia. The ground would have become debatable if it had not been strongly fortified on what may be called a trench-and-block-house system, the indications of which may be traced at the present day. The Great Dyke, known as the Recken Dyke, the Devil's Dyke, St. Edmund's Dyke, extended over Newmarket Heath from Reche upon the Cam towards the woods of Essex. Parallel with the Great Dyke, at a distance of seven miles, was the Fleam Dyke.

On the summit of Gogmagog Hills is a triple circular entrenchment enclosing about 13¼ acres, known as Vandlebury, which is, according to Gough, one of a chain of forts reaching from the woodland of Essex to the Fens.

But it is time to leave the Gogmagog Hills and follow the Roman road to Cambridge.

The outline of the Roman Camboritum can be readily and clearly traced. The western wall went from what is known as Mount Pleasant, and enclosing the little church of St. Peter and its churchyard, ran to a point near the old Norman Grange, known as the School of Pythagoras, where the southern side began and crossed Magdalene Street by the south side of the Chesterton Road, the terrace in Magdalene College grounds forming part of the rampart. The eastern wall began a little beyond the college grounds and proceeded to Akeman Street, the Roman road, in the vicinity of the present Victoria Road.

At the extremity of the natural promontory enclosed by, though not as extensive as, the the Roman camp stands the mote or mound specifically known as the Castle Hill, which gives the popular name of Castle End to this outlying north-western part of Cambridge.

William the Conqueror erected a castle at Reche and another at Wisbeach. In 1069 he took up his residence in the Castle of Cambridge, whence he conducted his military operations against the Isle of Ely, where Hereward, the so-called last of the Saxons, maintained the struggle against him. The last remaining relic of the castle, the gateway, was pulled down almost in our own day to build the county courts.

In the neighbourhood of the Castle of Cambridge was

The So-called School of Pythagoras.

This never was a school, and had nothing to do with Pythagoras. It appears to have been a farmhouse or grange of the twelfth or early part of the thirteenth century. The manor-houses of this period were usually in the form of a parallelogram, and of two storeys in height. The lower storey appears to have been invariably vaulted. There was no internal access from the lower to the upper storey, the communication being by an external flight of steps such as we see at the King's School at Canterbury. In the upper storey was at times the only fireplace in the building. Wealthy Jews appear to have been the first builders of stone houses in this country, as is seen in the Jews' house or houses at Lincoln and Moysey's Hall at Bury St. Edmunds. To the rooms above mentioned were frequently added a cellar on the lower and the solar on the upper floor. The kitchen appears to have been in a courtyard external to the mansion.

The lower room of the "School of Pythagoras" is 60ft. in length. The vault has disappeared, and there only remain two vaulting shafts. Light is admitted by an inserted fourteenth-century window of two lights. The windows on the first floor are fair examples of Transition work.

In the history and constitution of the Guilds of Cambridge we may read the record of its early unfulfilled promise. Two Guilds—those of Corpus Christi and the Blessed Virgin—combined to found Corpus Christi College.

There were till lately several old houses in Cambridge, particularly in Bridge, Trinity Street, formerly the High Street, and the neighbourhood of the Petty Curry. The Jewry was in the parish of St. Sepulchre's. Some have thought that the Jews did not live in the Jewry, but that is a mistake. As a matter of fact, they constructed numerous stone houses in and about the Jewry at a time when the majority of houses were constructed of wood.

The Churches of Cambridge

would take a volume in themselves. To make the study of them intelligent one has to make a circuit of several miles round Cambridge, and even further than that at individual points, to trace their similarity to other churches in the same district. Thus what I have seen described as the singular tracery and form of the windows at St. Michael's, Cambridge, proves not to be singular when compared with that at Over, some miles to the north-west of Cambridge, which appears to be by the same architect or band of workmen.

I shall omit all notice of the most remarkable church in Cambridge, St. Sepulchre's in the Jewry, as that is well known and has been fully described as one of the round churches of England. I shall speak of those only which were connected with the colleges, and in doing so I shall take them in chronological order, as they existed in and were part of the town before the colleges were built.

The Oldest Church in Cambridge,

and the oldest building in the town, is St. Benedict's, or St. Bennet's, Church. Its situation is slightly to the west of the site of the Austin Friars, and immediately adjacent to Corpus Christi College. The body of the church was restored by Mr. R. Brandon, and exhibits few traces of its remote antiquity. The tower, however, remains intact. It is of that version of Early Romanesque which we commonly call Saxon. It is in diminishing stages, not in one upright mass, as the tower of St. Michael's, Oxford. The material is rough masonry, the quoins being in "long-and-short" work. Of the three stages of which the tower is composed the lowest occupies nearly half of the entire height. The nave is of the thirteenth century. The south aisle of the chancel is formed by a building that in mediæval times consisted of an upper and lower chapel, the former of which was used as a lecture-room.

Much the

Finest Example of First Pointed

in Cambridge is what is now, and has been since the early part of the sixteenth century, the Chapel of Jesus College, formerly that of the Nunnery of St. Rhadegund. It was erected between the years 1150 and 1245, the north transept being the oldest portion of the existing building. It was originally in the form of a cross, with a tower in the centre, and had, in addition to the transepts, aisles on the north and south sides of the eastern limb, flanking it along half the extent of its walls and forming chapels, which opened into the chancel by two pier arches in each wall. Of peculiar beauty are the piscina and sedilia; the series of lancet windows, with blind arcading between them, in the chancel; and the roof-storey gallery on the inner side of the tower walls. The piscina was thought so beautiful that it was copied in the parish church of Histon, to the north of Cambridge, and in the ancient hospital of St. John, where St. John's College now stands. The nave had seven piers on either side between it and the aisles. These piers were alternately cylindrical and octagonal. Upon this splendid fabric Bishop Alcock of Ely brought what was little else than ruin in transforming it into a college chapel. A considerable amount of his work has been undone in our own day, and there appears to be no reason beyond the expense that would be incurred to prevent the whole being brought back to its primitive condition.

The Cambridge example of

The Second Pointed Style

is the fine church of St. Mary-the-Less without Trumpington Gates, attributed to Alan of Walsingham, remarkable for its window tracery, and particularly for that of its east window, in which some see an approach to the Flamboyant character. It is a lofty body without aisles or any structural division between nave and chancel. The separation was effected by a screen. The length is 100ft. and the width 27ft. The church is divided into six bays, each of which, except the westernmost, is a double square on plan. The tracery of the windows on the north side is all modern, with the exception of that in the easternmost window. In the eastern gable and in that on the south side are windows the tracery of which is exceptionally rich and flowing. The tracery is in the same style and even from the same patterns as that of the same date in Ely Cathedral. In the fourth bay are traces of chantries both on north and south. The gallery connecting with the church is of the middle of the fourteenth century, at which date the choir was refitted. The new quadrangle of Peterhouse was built at the same time.

One might be tempted to think on entering a college that the chapel was the most important building, the first built, and that all the other buildings had clustered round it. That is not the historical fact. The least ambitious part, the chambers, comes first. The chamber, the hall, the chapel—such was the progressive development.

The Cambridge Schools.

We know the appearance of the Cambridge schools in the middle of the fifteenth century. On the north side of the quadrangle stood the Theology School, and on the west that of Canon Law, with the new library above it. To these on the south side were added the Schools of Philosophy and Civil Law. The whole building appears to have been completed in 1470 or 1471. The south building was entered by a *vice* or turret staircase at the north-east corner. It formed part of the east range containing the gateway—still preserved at Madingley, near Cambridge—which was begun in 1470.

These schools were the outfit of the mediæval University of Cambridge. They were confined to a single building. The colleges, on the other hand, were numerous.

It has been argued that the dispositions of a monastery were derived from those of a Roman villa, and in particular from those that partook both of the character of the town and country house, and this resemblance has been worked out in detail. The cloister, with its pillars surrounding an open court having apartments opening from it, is, it has been argued, clearly derived from the peristyle common to the Roman town house and the country mansion, which was the part of the house reserved for private use. The outer court, with its stables, granaries, &c., corresponds with the *villa rustica* of the Roman country house. The *tablinum* becomes the chapter-house. The kitchen and refectory are in both cases situated on the outer side of the court. It is easy to press the analogy too far, but there is an evident truth in it.

So it may be said that there is between the general plan and disposition of a college an analogy with that of a monastery.

The Colleges of Cambridge.

The colleges which fall within the mediæval period are fourteen in number.

St. Peter's, the earliest of the Cambridge colleges, was founded by Hugh de Balsham, Bishop of Ely, in 1284. He bequeathed funds which enabled his scholars to purchase land to the south of St. Peter's Church (now Little St. Mary's) and built upon it a handsome hall. The quadrangle was not begun until 1424. The buildings were then carried on continuously until about 1466.

Clare College was founded in 1326, and was originally known as "University Hall." This college does not appear to have been arranged upon the quadrangular plan until subsequently to the mediæval period. It is now wholly Renaissance, and the best specimen of that style in Cambridge.

Pembroke College is one of the four colleges founded in the middle of the reign of Edward III. The south side of the quadrangle was begun in the lifetime of the foundress, and the construction of the chapel—the first college chapel in Cambridge—was authorised by a Papal bull in 1355.

Gonville Hall was originally erected on another site, and transferred to the present one by William Bateman, bishop of Norwich. The chapel, occupying part of the south side, was built in 1393; the chambers that complete that side and form the west side in 1441; the east side was not built until 1490. The chapel was built with its east end free, no buildings abutting upon it.

Trinity Hall has the peculiarity of an entrance court interposed between the quadrangle and the street, like the *curia* of a monastery. The quadrangle is larger than in any previous college—115ft. long and 80ft. wide. The chapel is believed to have been built in the fifteenth century. Trinity Hall was a house of study for the monastery of Ely prior to its conversion into a college for the study of civil law.

Corpus Christi College, built between 1352 and 1377, exhibits the first regularly-planned close quadrangle, as it has a hall range on the south, containing the hall, kitchen, and master's lodge, and of chambers upon the other three sides The buildings are low and of equal height throughout. There was no chapel, but two parish churches, to either of which the students could resort.

The first stone of the old court of King's College was laid in 1441. The area was so cramped that the formation of a regular quadrangle could not be attempted. The first stone of the chapel for the enlarged foundation was laid in 1446. The design for the enlarged college was never executed, and the large southern quadrangle has sprung up in quite modern times. A closed quadrangle was contemplated, of which the chapel would have formed the north side; the west side would have been occupied by the library, the hall, and the Provost's lodge; the south and east sides by chambers. Westward of the chapel would have been a cloister, like Wykeham's at Winchester, and New College, Oxford, with a lofy detached campanile.

King's College was founded by King Henry VI. in 1441. Two years later the king's plan was greatly extended. The college was not completed by either Henry VI. Edward IV. or Richard III., but by Henry VII.

Queen's College was founded by Margaret of Anjou in 1448. The principal quadrangle was completely designed and finished in a few years. It is entered on the east side, which, as also the south, is occupied by chambers. The hall, kitchen and buttery are on the west side, whilst the original chapel and the library were on the north. Soon after the erection of the great quadrangle a large range of buildings was erected to the west, with, what is an exceptional feature for Cambridge, a cloister-walk on the ground floor. The arches are plain four-centred arches of brickwork, of three chamfered orders.

Catherine Hall was founded in 1473. The buildings formed a quadrangle. The hall, library, and master's lodge were on the north side, and the chapel on the south, projecting eastward beyond the eastern range of chambers. This college was wholly rebuilt in the seventeenth and eighteenth centuries.

Jesus College was made into its present form from the pre-existing Nunnery of St. Rhadegund, about 1495. The distinctive features of this college are the cloister surrounding the original quadrangle inherited from the nunnery, the entrance court, and the road leading to the entrance-gateway and running between the walls of the Master's and Fellows' garden. The cloistered quadrangle was universal in monasteries, but not to be found in colleges, except in their secondary courts. In ecclesiastical buildings the Vicar's Close at Wells presents a near analogy to the ordinary college quadrangle.

Christ's College was built on the site of a hostel called God's House. Margaret, Countess of Richmond and Derby, obtained a licence to complete the college, gave it a body of statutes, and lived to see the quadrangle completed. The chapel occupies part of the north side, but extends beyond the eastern range of buildings. The remainder of the north side, the whole of the south side, and the greater part of the west is occupied by chambers. The library is on the first floor, on the west side, to the south of the gateway. The buildings have been much transformed externally, but the ancient structure remains.

Trinity College sprang up from a variety of hostels, of none of which are there now any but the most fragmentary remains. The history of this noble college itself falls without our period.

Magdalene College stands apart in more senses than one. It occupies the site of an ancient Benedictine establishment, dating from 1428. Different religious houses built different portions; Ely built one chamber, Walden a second, Ramsey a third. The buildings, with the exception of the Pepysian Library, were completed before the end of the sixteenth century. In the quadrangle of Magdalene is to be observed the corner staircase turret, a feature of Cambridge but not of Oxford Colleges. The entrance gateway is unaccompanied by a tower. The hall, butteries and kitchen occupy the east side; the hall being at the north end and the kitchen extending to the external south boundary of the buildings. On the north side is the chapel next the hall; the remainder was formerly occupied by the master's lodge.

A vote of thanks to the lecturer was proposed by Mr. Butler Wilson and seconded by Mr. Francis Hooper, and the meeting then ended.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Inexpensive Balcony.

LONDON, W.—IGNORAMUS writes: "How could I obtain an inexpensive balcony for a small house?"

An inexpensive balcony might be constructed with strong wooden brackets resting on corbels. On this a pitchpine floor could be placed, with wooden balustrade. The outer overhanging edge of this floor should be tied in with an iron strap running along its upper surface with an iron plate on the inside of the wall, or an artistically wrought iron stay can be used instead to support the outer end of the balcony. If something more substantial is required, an iron balcony might be used, names of makers of which can be obtained from our advertisement columns; or a light stone balcony, with stone slabs on iron or steel cantilevers or brackets and a light balustrade, could be adopted.

Proprietorship of Plans, Specifications and Quantities.

CARLISLE.—W. E. writes: "When tenders are sent to an architect who is employed to prepare plans and take out quantities, and the job let, are the plans and priced quantities his property or his client's, the architect being paid for his work?"

The question is a very debatable one, and we know of no legal decision that gives a definite answer, but as a matter of opinion we do not think the client is entitled to claim the plans, quantities or tenders. Special attention should be paid to the fact that the architect is engaged as a professional adviser to supervise the carrying out of building work, and it is quite possible for him to do this without preparing plans, or even a specification for that matter. His expert knowledge is not purchased by the client outright, the architect being in the same position as the doctor, lawyer or painter, whose notes, sketches and memoranda, it would be foolish to expect to be delivered up to their clients. In fact, it appears to us that if the drawings, &c., are the property of the client, it would logically follow that the sketches and memoranda, the architect's stock-in-trade, should be delivered up also, which is absurd. When the client gets his building completed the contract is fulfilled and he can claim nothing else. If he does not proceed so far as this the loss is his and not the architect's, for if the plans were the property of the client before the building was begun, they would also be his afterwards, and this, as we have seen, is not right. Of course the architect can, if he chooses, sell the plans outright by special contract. However, it would be always best to get the client to agree in writing to the architect retaining the drawings to insure himself. Of course, no architect would reasonably object to letting an honest client have a copy of the plans for use in executing necessary repairs at any time, such as to show position of drains and gas- and water-pipes. An architect can, if he choose, protect himself against his plans being used elsewhere by copyrighting them.

Jointing Materials.

QUERIST writes: "Which is the best material for making a joint of iron casements in a stone window? What is the best joint in good work for the coping of a stone-terrace balustrade?"

The jointing material may be neat cement, or equal proportions of cement and sand, for bedding iron casements in a stone window. Any holdfasts may be run with lead if preferred to liquid cement. The bad reputation of lead in contact with iron is chiefly due to the corrosion at the foot of iron railings run with lead, where the deterioration is, however, due more to the fact of moisture staying longer in contact with the metal at that part, owing to the dust that collects there. For the coping (moulded or plain) of a stone-terrace balustrade "double-arris joggle with pebbles in cement" may be used, as shown in Fig. 1, or "dovetailed lead plugs run in," as shown in Fig. 2. H. ADAMS.

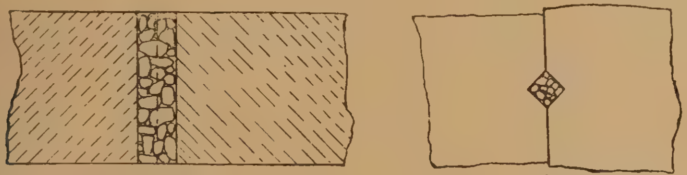
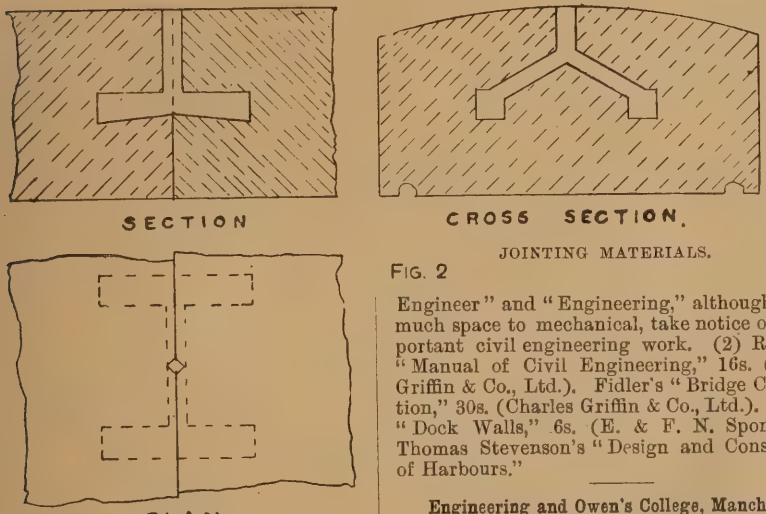


FIG. 1



JOINTING MATERIALS.

FIG. 2

L.G.B. By-laws.

BIRMINGHAM.—H. B. writes: "Where can I obtain the Local Government Board's by-laws relating to isolation hospitals?"

The two "Memorandums" and the "Report" on isolation hospitals can be obtained from the King's Printers, Messrs. Eyre & Spottiswoode, East Harding Street, London, E.C., price 1d. each, and 10s., respectively. There are no "by-laws" relating to isolation hospitals published by the Local Government Board.

Urban District Council and Roads.

ROMFORD.—E. G. H. writes: "It is proposed to erect two villas on a plot measuring 1 acre, 1 rood, 14 poles. A certain lane is 22ft. wide, but the urban district council require a 36ft. road, the 14ft. to be given along the entire frontage. Can they enforce this? Ought not the measurement to be taken equally on each side from the centre of the road? Also, at what distance from the frontage must the building line be to be exempt from control of the urban district council so far as widening a road is concerned? Council have adopted Model By-laws.

We think, if you build, the council can force you to make the road in front 36ft. wide, by setting the frontage back 14ft., but if you can get the owner on the opposite side to give 7ft. up or purchase the opposite plots yourself and give up 7ft. on each side, we do not think the council could take 14ft. off one side unless they paid compensation. In the new Model Rural By-laws of the Local Government Board provision is made for equitable adjustment by stipulating that in the case of houses fronting existing narrow roads the distance shall be measured from the centre line of the street.

Civil Engineering.

SOUTHSEA.—J. H. M. writes: "(1) Is there a journal published dealing with civil engineering more than with mechanical engineering? (2) Please name a good work on this subject dealing especially with docks, bridges and breakwaters."

(1) We do not know of one. "The Surveyor," weekly, 3d., deals with municipal work. "The Engineer" and "Engineering," although giving much space to mechanical, take notice of all important civil engineering work. (2) Rankine's "Manual of Civil Engineering," 16s. (Charles Griffin & Co., Ltd.). Fidler's "Bridge Construction," 30s. (Charles Griffin & Co., Ltd.). Allen's "Dock Walls," 6s. (E. & F. N. Spon, Ltd.). Thomas Stevenson's "Design and Construction of Harbours."

Engineering and Owen's College, Manchester.

HASLINGDEN.—H. M. M. writes: "I enclose a prospectus of the department of engineering at Owen's College, Manchester. My son, being over seventeen years of age, intends to enter for the preliminary examination. The cost of the course is about £30. Do you approve of it?"

Owen's College, Manchester, provides a most admirable course in engineering, but there is nothing to modify our former recommendation. Only by becoming articled to an engineer can your son get a practice and set up in business as an engineer. Technical colleges are useful for imparting a knowledge of theory, but practical knowledge can only be obtained by experience on works and in shops under a capable civil engineer. We may refer you to Mr. Mansergh's address on this subject published on p. 238 of our issue for May 1st last.

"Carbolineum Avenarius."

LONDON, S.W.—A. G. H. writes: "Where can 'carbolineum avenarius,' a material for preserving wood, be obtained?"

Messrs. Peters, Bartsch & Co., of Derby, and 68, Queen Street, Cheapside, E.C., are the makers.

New Patents.

These patents are open to opposition until December 9th.

1900.—Sewage Filtration.—19,264. D. CAMERON, 1, Sylvan Road, Pennsylvania; F. J. COMMIN, 7, Bedford Circus; and A. J. MARTIN, Bradninch House: all of Exeter. One part of this invention relates to an improved grit chamber so constructed that floating solids in the sewage are carried away and not allowed to accumulate on the surface. This is accomplished by providing the chamber with vertical or inclined guide-boards, either fixed or movable. Another part of the invention relates to the distribution of the sewage over the bed, this being effected by several funnels carried by vertical shafts built up from the floor. It is claimed that, being thus rigidly supported, the distributors will not get out of level.

Urinals.—21,692. J. DUCKETT & SON, LTD., Sanitary Ware Works, and J. W. BULLOCK, 30, Accrington Road; both of Burnley. A removable cover strip is provided over the joint between the caps, the flushing pipe fitting it at the top. The flushing rim is preferably made of earthenware and is formed in a loose piece to fix on top of the curved back. In this way copper sparge pipes are dispensed with, cheapening the cost of the urinal.

Street-Paving.—22,105. A. C. W. HOBMAN, 110, Queen's Road, Peckham, S.E. The object of this invention is to produce a paving which, while possessing the qualities of asphalt, is non-slipping and durable. Granite, Kentish rag, or other suitable stone is broken to pass through a 2in. ring. The pieces are thoroughly dried, and are then coated with a waterproof substance like mineral oil, Trinidad pitch or tar. After a good foundation has been prepared, the stone is mixed with a flux, laid, rolled and grouted.

1901.—Lifting Jacks.—3,629. E. R. FARNSWORTH, Bank House, Bank, Matlock. The jack has a central screw operated by a worm-wheel which is mounted on ball bearings, thus facilitating its use.

Forming Dovetails.—9,262. P. HANSEL, 250, Bahrenfelderstrasse, Ottensen, near Hamburg. The machine is fitted with two pairs of knife heads adapted to form mortises and tenons simultaneously in two boards.

Artificial Stone.—15,214. E. KREFT, Hartsteinfabrik, Münster, Westphalia, Germany. The "digester" made according to this invention, in which the moulded stones are submitted to the action of steam under pressure, consists of a boiler fitted with a rail on which the wagons carrying the stones are suspended. In this way the risk of damage is largely reduced, and the steaming is more economically effected.

Water-closet Seats.—17,760. W. E. MASON and G. MUSGRAVE, both of the Pearl Brook Sanitary Works, Horwich, Lancs. The seat is formed integral with the pan and of the same material—fictile ware. A throating is formed in it to receive a hot-water or steam pipe for heating the seat, which, while being thus made comfortable, can be thoroughly cleansed.

The following specifications were published on Saturday last, and are open to opposition until December 16th. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1900.—16,724, RAWLINSON, setting devices for mortising machines. 18,308, MACFARLANE, rotary kilns. 18,579, STEWART, files. 18,892, WRIGHT & DARWIN, fixing gas fires in open grates. 19,566, MCINROY, hoist-door fittings. 19,706, ALLEN, ALLEN, FORD & ALDRED, ventilating baths, sinks and lavatory basins. 20,132, HOPKINSON, LOWIS & J. HOPKINSON & CO., LTD., valves. 20,679, HIPKINS, coin-freed locks for doors. 21,275, TAYLOR, sash-fasteners. 21,696, JONES, opening and closing fanlights, casements, &c. 22,074, TYMM & SLACK, knife for brickmaking machines. 22,119, WRIGHT, windows. 22,155, JOHN MCGLOUGHLIN & CHARLES MCGLOUGHLIN, LTD., opening and closing window-sashes and ventilators. 22,228, HUTCHINGS, clip for fixing roofing slates. 22,470, BEREND (*Schauer*), incandescent gas mantles. 22,730, LESTER, astragals for roof lights and windows.

1901.—737, LACEY & REES, portable pump. 2,870, THOM, parallel rulers. 10,183, BUSCH, acetylene gas generators. 13,794, FLECHTHEIM, street-sweeping machines. 16,293, BURGUM, flushing apparatus. 16,465, ZUPPINGER, door locks and latches. 17,161, JUSTICE (*Mississippi Glass Co.*), machines for rolling configured wire glass. 17,560, BOULT (*Druitt*), pulverising or crushing machines. 17,566, BELIN, apparatus for generating acetylene. 18,008, HÖYER-ELLEFSEN, fireproof floors. 18,031, KINNEAR, fire-resisting doors, blinds, &c.

Keystones.

A New Central Library at Bournemouth has been erected at 2, Stanhope Gardens, facing the Horse Shoe Common.

New Synagogue at South Shields.—At a meeting of the Hebrew congregation at South Shields Mr. Henry Grieves, of that town, was elected architect for the proposed new synagogue.

A New Board School has been erected for the London School Board in Clancarty Road, Wandsworth Bridge Road. It has cost over £28,900 (exclusive of site), and contains accommodation for 414 boys, 414 girls and 416 infants.

Monument to Chopin.—The Russian Government has sanctioned the erection of a monument at Warsaw to the celebrated Polish composer, Frederick Chopin. The initiators of the projected monument intend inviting designs for the work from British and foreign sculptors.

An Indian Competition.—We hear through Mr. A. H. Ryan-Tenison, A.R.I.B.A., that his late colleague, Mr. Edward Thornton, A.R.I.B.A., has won the first premium for the New General Post Office, Lahore, India. There were thirty-two competitors. It will be remembered that Mr. Edward Thornton left England to take up the appointment of head of the Architectural Department of Sir Ackwin Martin & Co.'s firm, Calcutta.

A New Building at the Dundee Royal Asylum is being erected at West Green. The building has been designed by Mr. T. S. Robinson, architect, of Dundee, and has accommodation for about sixty patients. The style of the building is Scottish Baronial, of red stone from Ayrshire for the dressings, while local quarries have supplied the rubble. The centre part containing the principal entrance is of one storey, and the wings to the front three storeys, while to the back the wings are only two storeys. The cost has been over £22,000. The contractors were: Mason, Mr. William Bennett; joiners, Messrs. D. P. How & Son; plumber, Mr. David Brown: plasterer, Mr. James Laburn; slater, Mr. A. Buttar, jun.; glaziers, Messrs. Lindsay & Scott; bells and blinds, Messrs. J. Pullar & Co.; heating, &c., Messrs. G. H. Nichol & Co.; firecocks and water pipes, Messrs. P. Nucator & Son; roads, Mr. Peter Girrity; carving, Mr. James Bremner; painters, Messrs. Petrie & Greig; drains, Mr. Peter Bain; electric lighting, Messrs. J. Muckersie & Co.; clerk of works, Mr. James Robertson.

Baptist Church, Lewin Road, Streatham, S.W.—The existing school chapel has had to be incorporated in the new design for the church, and has been utilized as transepts to the new building and new nave being erected with two-light tracery-headed windows and buttresses, and a bold square tower and spire, with angle pinnacles and a metal corona and finial. The main doorway is in the base of the tower. The roof is of open-timber principal trusses, with boarded ceiling varnished. The seating is semicircular in plan. The choir is on the daïs in front of the pulpit, with a baptistery lined with tiles and marble steps on the daïs. The organ gallery is in an apse behind the pulpit, with two vestries under. A large vestry is formed behind the present school, with a heating-chamber under. Provision is made for a future gallery at the end of the nave. The building is to be faced with red bricks with white Costessey dressings. The roof is to be of green slates. The contract without seating is £3,033. Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clement's Inn, Strand, W.C., are the architects.

Emmanuel Church, Cambridge Road, Southport, has been completed by the addition of a tower and peal of bells at a cost of £4,000. The total cost of the edifice was about £30,000.

New Cottages, Homes and Schools are being erected for the children of the Medway Union at Chatham, at a cost of between £25,000 and £30,000.

The Chancel of Egerton Parish Church has been restored. A new altar dossal has been added, together with an altar cross. The carved oak of the choir stalls has been well cleaned.

In Connection with the Alterations at Windsor his Majesty the King has given an order to a Derbyshire firm for eight marble pedestals 4½ft. in height, with Gothic panels. One of the pedestals is to bear a bust of Queen Victoria. The order is to be executed at an early date.

A New Sunday School has been erected at the rear of St. George's Road Chapel, Hull. Messrs. Gelder & Kitchen were the architects, and Messrs. Hebblewhite & Wilson were the contractors. The cost of the building is £5,200. The large hall accommodates 300, the infant school 200, young men's room 70, young women's room 150, and the church parlour 150.

A Freemasons' Hall at Oswestry is being erected at the junction of Roft Street and Market Street. Brother W. H. Spaull, F.R.I.B.A., is the architect. The building will consist of a hall and a dining-room which can be thrown into the hall when required, with retiring-rooms and other conveniences. On the first floor there will be a large room, to be used for Masonic purposes only, and a tyler's room. A caretaker's house will also be attached. The building will be faced with red bricks and buff terra-cotta dressings. The cost is estimated at about £2,000. Messrs. Griffiths & Sons, of Ellesmere, are the contractors.

The New Hall for Barry Parish Church has just been completed from the plans of Mr. James P. Bruce, architect, of Carnoustie, and is situated on the site of the parochial school. The design is Gothic, freely treated, and can accommodate 200 persons, and there is also an ante-room and other conveniences. The contractors were: mason work, Mr. George Robertson; joiner work, Mr. George Fox; plumber work, Mr. John M'Andrew; slater work, Mr. Alexander Hogg; lath work, Mr. James Fyffe; plaster work, Messrs. M'Ritchie & Co.; smith work, Mr. Robert Crighton; ventilation, Messrs. Robert Boyle & Son, Ltd.; heating, Mr. William Nicoll; glazing, Messrs. Donald & Smith; painting, Messrs. P. & A. Davie.

A New Church at Roath, near Cardiff, capable of seating nearly 1,000 persons, has been erected as a memorial to the late Bishop Smythies, of Zanzibar. It is of red bricks with stone dressings. The site was a very awkward one, and thus the nave of four wide bays is flanked by a narrow processional aisle on the north side and a very wide aisle on the south. There is no chancel arch, the main roof being unbroken from end to end, and the chancel is of the same width as the nave. There is a side chapel north of the chancel, and the south aisle is terminated at the west by a baptistery. When funds permit a lofty stone rood-screen will stretch across the entrance to the chancel, with ambons north and south for use as pulpit and lectern. The church has cost over £10,000.

Liverpool Cathedral Fund Hanging Fire.—There can be no doubt, says the "Liverpool Review," that the scheme is hanging fire. In some six months nearly half as much as the sum with which Truro began—little Truro, with less than one-twentieth of our city's population, not to speak of the population of the diocese—has been collected. Roughly, one hundred thousand and a half has been subscribed, enough to buy a decent site, no more. The late bishop used to say that he would not like to think of beginning with less than a quarter of a million. He was right. That was Truro's amount. Even so, Truro has not completed its cathedral! And yet some of us have been foolish enough to think that we can get the site, build the fabric, complete the endowment, all for the sum with which Truro built its nave, all for the sum that has already been spent on the Westminster Roman Catholic Cathedral. Bolder ideas were needed or they would never get bolder, bigger generosity.

The Royal Society of British Artists has decided to limit both of its shows to the works of the members. Hitherto the spring exhibition was open to "outsiders."

The Furniture in "The Last of the Dandies," Mr. Beerbohm Tree's new production at Her Majesty's Theatre, was supplied by Messrs. Oetzmann & Co., of 63-79, Hampstead Road, N.W.

A New Church for Plumstead, to be called St. Mark's, is being erected in Old Mill Road, Plumstead. The buildings will include schools, rectory and club-rooms, and will cost over £15,000.

Bridlington Priory Church.—A peal of eight bells have been presented to the Priory Church at Bridlington, which are to be used for the first time at the coronation of the King.

A New Public Hall and Library at Abergwynfi has been opened. The building cost £2,800, and the public hall is capable of seating 800 to 1,000 persons.

A New Church at Boosbeck, near Saltburn, has just been erected. The contract price for the erection of the church was £3,150, and in addition to this the furnishing has cost £600.

A Three-light Memorial Window to the memory of the late Lieutenant Robert Walter Maxwell Brine, his elder brother, Frederic Bruce Brine, and his sister, Henrietta Ina Lindesay, was unveiled at the parish church of Bishop's Waltham, Hants, recently. The window was executed by Messrs. Lavers & Westlake.

A New Nave in Awsworth Parish Church is being erected of red sandstone bricks, with dressings of Coxbench stone. The seating accommodation will be for 600 persons. The eastern portion of the old nave is being retained, and will be adapted as the chancel of the new church. The architects are Messrs. Naylor & Sale, of Derby, and the general contractors Messrs. Walker & Slater, of Derby.

New Public Baths for Bradford.—Plans were recently approved by the Bradford City Council for the construction of an open-air swimming bath and gymnasium at the south-east side of Harold Park. The estimated cost is £1,100. New public baths are also in contemplation for Morley Street and Drummond Road, Bradford, the cost being estimated at £41,000 at the former place and £10,000 at the latter.

The Argyll Memorial.—A cross has been erected by the Dowager Duchess of Argyll to the memory of her husband, the late Duke of Argyll. The cross stands 21ft. in height, and is of fine red stone. It has been placed on a high cliff called Dun Dubh, which overlooks the Atlantic Ocean and is situated at Macharinoch, Kintyre, Argyllshire, about twelve miles from the Mull of Kintyre. The cross is massive and simple in form. The pedestal is square, and bears an inscription on each of the four sides.

Marlston Church, Berkshire, which was built by Sir Geoffrey Martel originally in the Norman style of architecture, and forms part of the parish of Bucklebury, Berks, has been considerably restored, enlarged and decorated. For several years past the fabric of the old church showed signs of weakness, and the architect reported that it would be necessary to underpin the whole building. It was accordingly resolved to effect a complete restoration of the church and also to build a new chancel and vestry.

A New Steeple to the Parish Church of Foot's Cray, Kent, has just been added. As long ago as 1700 the steeple of the church was condemned as unsafe, but it was still standing when the present rector entered upon his charge in 1861. It was then stayed and strengthened, and so made to serve for another forty years. But within the past few months the condition of the structure had become so dangerous that it was found absolutely necessary to demolish it and erect a new one. The work of construction was entrusted to Messrs. Stebbings & Pannett, of Foot's Cray and Sidcup, and they have carried out the designs of Mr. Boucher, of the firm of Drake & Boucher, architects, Rochester, reproducing exactly the old Kentish timber and shingle style of steeple which has been associated with the church for hundreds of years. Advantage was also taken of the occasion to have the peal of five bells retuned by Messrs. Gillett & Johnson, of Croydon, and rehung in the steeple. The work has cost altogether £600.

Views & Reviews.

How—and How Not—to Build a House.

This book is a collection of eight lectures—three of them by Mr. Parker, three by Mr. Unwin, and the remaining two written conjointly. The chief theme is the degradation of art and architecture to day, with suggestions for their improvement. We are urged to abandon the conventionalities which force on us things which we do not require, to put aside those fripperies and fineries which display themselves in most homes, to adopt a plainer yet more truthful system of design and decoration. "Let us have such ornament as we do have really beautiful and wrought by hand . . . let us call in the artist, bid him leave his easel pictures, and paint on our walls and over the chimney-corner landscapes and scenes which shall bring light and life into the room. . . . Then, if necessary, let the rest of the walls go untouched, in all the rich variety of colour and tone, of light and shade, of the naked brickwork. Let the floor go uncarpeted, and the wood unpainted, that we may have time to think. . . ." Now this, in the introduction, gives us a key to the authors' ideas of reform, but they appeal almost to our sense of humour rather than stir our very being against the enormities of the modern house. Everyone with the slightest artistic feeling must deplore the taste which fills our drawing-rooms with a thousand and one petty ornaments, the floor bespattered with occasional tables which hardly seem to justify even such a limited demand on their services as their name implies (as Mr. Baillie Scott once put it); the taste which covers the walls with "His Majesty the Baby" and similar trash; or which insists on everything being carved and stamped and scratched with the notion of redeeming it from a hated plainness. We are alive to the need for reform, but what is the use of attempting the extreme and the visionary as set forth in the passages quoted above? You are appealing to the householder, and he will never improve if you insist that he is to live between naked brick walls and on uncarpeted floors. In reading through this book, however, we are glad to find that Mr. Parker, at least when alone, has something better to say; in fact, he says a great deal which is most commendable. He has the Ruskin dislike of anything machine-made. If it is a piece of copper, he wants it with the marks of the hammer by which it was wrought, and not "lost in mere smoothness and mechanical finish"; if it is window glass, he wants it leaded and not plate. In the lecture on "Our Education in Art" he touches on a vital matter, that of the training of an architect. According to his system the student would first acquire a comprehensive knowledge of pure building construction, but no architecture—"in so far as it can be separated from building construction. . . . The course of study laid down by the Institute of British Architects for its pupils commences with 'Evidences of Study' of old Greek and Gothic buildings; in all cases suggestion is substituted for development, and in consequence we have turned out by the thousand men capable of reproducing works in all styles, but with no vital appreciation of the spirit and causes which lead to the existence of any one of them, and not one who can evolve a really vital work of art among them." The Institute, it is true, has a lot of blame laid at its door, but we do not think that Mr. Parker has proved his system to be any better, judging by the examples in this book. It is easy enough to talk about imperfections, but less easy to correct them; it is simple to speak of catching and portraying "the words and messages of Nature, and the poetry of the whole," and to discourse on the relative values of shadows in a landscape, but the force of the remarks is lost when reference is made to such specimens of draughtsmanship as those presented in this book; in fact, it would have benefited the letterpress greatly if many of the plates of drawings and designs had been left out: one would not then have set up a comparison. It is impossible now to refer to many other matters dealt with under the headings of "Art and Simplicity," "Furniture," "Building and Natural Beauty" or "Co-operation in Building." The tenor of the remarks will doubtless be gathered from what has already been said. There is much which is good, and much which is otherwise (mostly from the pen of Mr. Unwin); and if it had not been for some of the samples of work shown among the sixty-eight plates we should have considered the work thoroughly commendable.

"The Art of Building a Home." By Barry Parker and, Raymond Unwin. London: Longmans, Green & Co. 39, Paternoster Row; price 10s. 6d. nett.

Mitchell's Advanced Building Construction.

The architectural profession has not yet been supplied with a really good and comprehensive work on building construction. Several attempts have been made to meet the want, but not one has thoroughly succeeded. Rivington's "Notes on Building Construction" was a worthy attempt to cope with the difficulty, and it remains the standard work, but one could not expect that this would be anything more than a fairly good book of recipes, mostly rule-of-thumb and gathered from various sources, and dealing also in an elementary manner with principles, the knowledge being now somewhat out of date. Such a large encyclopædic work as is required could only be expected from many specialists, who would have to carry out large and prolonged series of experiments. Of course, the chief reason for the incomplete and rudimentary knowledge of building materials and methods is the immense field covered, and only in few branches which are particular trades has full study been carried out, such as in pottery, iron and steel. But nevertheless there is an immense amount of information of real value that has been published of recent years in diffuse form, and from this it should be possible to prepare a book that would suggestively and elastically deal with the principles of building construction, just as Rankine has dealt with engineering and Unwin with machine design; and there is, therefore, no adequate excuse for such a book as Mitchell's "Advanced Course." The "First Stage or Elementary Course" suffered somewhat from the same want of grasp and clear treatment of principles, but its demerits were excusable as a cheap guide to the elementary South Kensington examinations, which, at the time it was published, merely required a number of facts, usually crammed by the student. With the advanced course, however, though intended as a text-book for these examinations, the two parts attempt to give full instruction in building construction. It is sad to think that many students taking the book at its own valuation will go through life with the notion that the course they have been taken through accurately represents the real and most advanced methods of building. Of course it may be contended that considerable investigation of every part of a subject need not be made, as what is already known is sufficient for all purposes; but the advances made in other trades, just as presumably unimprovable, disprove this passive attitude.

A book on building construction should deal clearly with the principles of the various sciences connected with building, so far as they relate to it, in an interesting manner, and should then proceed to elaborate the particular methods, materials and appliances at present in general use, treating them in a way that will not weary the brain; and in addition it should suggest methods of improvement, teaching the student to think for himself. Thus, the book should start with an introductory chapter dealing with the subject from an ethical standpoint, showing the union of the various branches of science of which it is compounded. If the author knew his subject well his inner thoughts on matters would add an interest and incentive to study that would carry the student over dry roads in other parts. Then the book should, we think, proceed to separate chapters giving the elements of chemistry, botany, geology, mechanics, metallurgy, &c., summing up all the points needed for the course and giving particulars of where to obtain further information. Graphic statics should come to the front of the book (and not be sandwiched in the middle as in Mitchell's "Building Construction"). It might also be possible to deal with mathematics in a short manner sufficient for its purpose. Then the book could proceed to particularize and apply these principles. At present we find in Mitchell's book statements and explanations arising without previous explanation and assuming a knowledge more advanced than is assumed in other portions; thus on p. 20 a formula for calculating the transverse strengths of concrete beams is given, but it is not shown how it has been determined; and again on pp. 166, 167, 176, 177, 178 and 180, the explanation of the derivation of the formulæ is not clear enough for the student. The same occurs in the chapters on brickwork, pillars and girders. The want of systematic treatment is apparent on p. 291, where to calculate the dimensions of shores reference has to be made to the chapter on pillars which follows.

In this third edition the text has undergone revision and amplification, and no fewer than 334 figures, including several double-page plates, have been added. Many of the by-laws of the Local Government Board and London County Council have wisely been included in the book, and in most trades a typical specification approved by some important public body has been inserted. This latter is a good feature. The chapter on sanitation has been revised by Mr. J. Wright Clarke, and is on the whole satisfactory.

We shall now mention a few errors and omissions; the latter need not be excused on the score that the book is already very large for the price, for most of it could be condensed with advantage, and if the system of putting an italic side-head to each paragraph were abandoned, except in the most important cases, and many of the paragraphs combined, it would economise space and enable the matter to be read more easily; as an instance we may refer to p. 73.

In the chapter on materials the chemical formulæ should be either abandoned, or extended and revised, with the addition of equations showing the chemical action of materials. If it were assumed that the student should know elementary chemistry, then the matter in the book is not needed, as it will be of no use to him, for he will already know it. Moreover, many of the formulæ are out of date and wrong. The wording of the descriptions is often most ambiguous. It is absurd to refer to the "impurities" in hydraulic limes (p. 2) when such "impurities" give these limes their value. Then again in reference to chalk, it is misleading to say it is unable to combine in this form with other materials; this should be deleted or an explanation given of what is meant. Then the term "violence" (p. 3) in reference to the separation of carbon dioxide from limestone in the making of lime is too strong an expression. The explanation of slaking is beside the mark: it should be stated that lime will not combine with carbon dioxide when no water is present. It should be clearly stated that fat and poor limes are not suitable for mortar, and that only hydraulic limes should be used. To speak of "the soluble lime in a saturated solution" (p. 4) is a misuse of terms. The explanation of the setting of limes (p. 5) is an assumption unwarranted by facts. The chemical formula for hydraulic limes and cements (p. 6) is wrong on the face of it. It is usual also to divide the parts of a formula with a full stop—thus $CaSO.2H_2O$, not $CaSO_4, 2H_2O$. It is not apparent what the analysis of gypsum on p. 7 refers to, weight or volume. If the former it is wrong, and moreover its nomenclature is old and has now been abandoned. The rough tests given for Portland cement are inconclusive, and a better method is given on p. 245 of our issue for May 1st last. The setting of cements might well be explained. Instead of saying that the shrinkage of the materials of concrete when mixed with water is about ·15 of the total bulk, why not say $\frac{1}{7}$, or on p. 173 why not $3\frac{1}{3}$ for "nearly 3·33 times"? The tests given on pp. 19, 20 and 21 are too vague and old to be of much value. Asphalt (p. 22 and following) is spelt without a final *e*. The analysis of bitumen (p. 23) could be omitted without loss. Earth is not kept "sweet and dry" after being covered with asphalt. It should be stated that hot rammers are used to compress the powdered asphalt. The statement as to the values of artificial and natural asphalts (p. 25) is out of place. The definition of plastering (p. 26) is somewhat crude, as are the definitions throughout the book generally. Sills are not only "often" but *generally* moulded before fixing (p. 30). It is somewhat amusing to find in a text-book the colloquial and slang terms used by London plasterers (p. 31). Iron nails

(p. 33) should not be stated as "oxidizing" in plastering; "rusting" is the word, as rust is not an oxide of iron only. Wire "lathing" should be substituted for the word "netting" (p. 34), as the latter suggests particular patent kinds. Fuller explanation should be given (p. 37) of the reason for washing sand. Considering that pit-sand generally was once water-worn, it is often no sharper than river- or sea-sands, and for roads and rough work the latter, being cleaner, are the best. On p. 38 reference should be made to shingled surfaces. On p. 45 the reference to the oscillations of the earth's surface needs explanation; also as the composition of silicic acid (and on p. 53) is very uncertain, being most unstable, the formulæ given should be omitted. The silicates are usually taken to be compounds of silicia with basic radicles. On p. 46 the word "impurities" is again misused. A definition of oolites is needed on p. 46. In defining the second cause of rock-formation "or" is printed for "and." Sulphuretted hydrogen (p. 47) is not an acid; sulphurous and sulphuric acids are here meant. The acids furthermore are not present in large enough quantities to "dissolve" the constituents of stones; they merely combine to form compounds soluble in water. The methods of testing stones for porosity should be more fully explained. The reference (p. 48) to the weight of a stone indicating its porosity needs modification. Quarry sap is not "moisture." The *purpose* for which a stone is used does not *determine* the position of the bed (p. 49). Silicic acid may have been the means of cementing the grains in sandstones (p. 51), but it does not remain in this form, and more often the cementation is due to silicates. The formula for felspar is not according to current practice, and is wrongly printed, as also are those for mica, hornblende and augite. There is a typographical error in the formula of carbonate of magnesia on p. 53, and another error in the paragraph relating to alumina on p. 54. The formula for kaolin is not in current notation, nor is it correct. The chemical tests for stone given on p. 54 are inconclusive as to weathering, for we have found Portland-cement concrete and red Corsehill stone effervesce and powder under sulphuric and hydrochloric acids, and there can be no doubt as to their weathering qualities. The reasons of disintegration of stones, and the way they weather, are not dealt with in the book. The specific gravities of stones are calculated into too many places of decimals, as stones vary very materially from the same quarry. It is not stated where these particulars were obtained from, and whether they are the average specific gravities found from a large number of tests, as they should be. The particulars of various stones are also too meagre, and almost useless in practice. Red Mansfield (p. 62) is given as "very durable," whereas bleached and crumbling specimens are to be seen on every hand in London; Corsehill is dismissed with the words "good weathering stone," but it is far more durable than Red Mansfield, being composed of 90 per cent. of silica. The "oxide" of iron in unburnt clay, referred to on p. 72, is a hydrated oxide of hydroxide or iron, the correct names of the "hydrous" oxides referred to on p. 74. On pp. 75 and 76 special makes of bricks and glass-tiles are mentioned, needlessly giving the firms who make them an advertisement, which is unfair to others making similar bricks, &c., and the same thing occurs in other places. The tests of brick piers and the tensile strength of bricks, given on p. 80, are given without sizes, which is most necessary to make them of any value. On p. 83 the method of preventing finely-wrought terra-cotta decorations and figures warping in the burning by adding sawdust to the clay should be noticed. Sodium chloride, on p. 84, is a high sounding name to use for common salt, and is but an instance of the way the authors go out of their way to make the book appear learned; also far too often one name for a material is given when several are in common use, such as in the names of the iron ores on p. 85. The section on iron and steel is, moreever, very incomplete and misleading, and we advise all students to read up the subject in recent works on engineering. The "Double" and "Triple" Best Iron (p. 89) is usually known as Best Best Iron and Best Best Best Iron. The crystalline properties of iron and their effect on its strength are not sufficiently dealt with, but it is needless to elaborate the defects of the section. Pitch-pine (p. 119) is praised for its "beautiful" appearance, whereas the concensus of cultured opinion is that its hot colour is distressing for interior work. The oxide of iron (p. 129) is known as "black" oxide, and if the author doubts its efficacy for painting iron by stating it as "supposed," why does he not investigate the subject and disprove or prove it? The formula for acetate of lead (p. 131) is wrong. The allusions to Classic and Gothic styles on p. 184 should be deleted, as the "styles" are outside the province of the book. A recurring decimal is misprinted on p. 210. There is a purely graphic method of calculating the dimensions of retaining walls which should be given; the method on p. 216 is at present obscure. The aim (p. 296) of half-timbered construction is stated to be to obtain a picturesque effect, but the element of cheapness where timber is plentiful should be considered.

THE MUNICIPAL ORPHANAGE, MUNICH. HANS GRÄSSEL, MUNICIPAL ARCHITECT.

The illustration on p. 193 of a damp-proof course in a hollow wall does not show the best method, which is given on p. 140 of our issue for March 27th, 1901. Throughout the book sizes of materials are given for particular purposes without an explanation of the reasons. The foregoing are perhaps the most flagrant instances of errors and omissions which are likely to seriously mislead the student, but there are many more we have not space to deal with; however, from what we have said it will be seen that the book needs considerable revision to be of much value as a text-book of the principles of construction. We can, however, compliment Mr. Batsford, the publisher, on the admirable manner in which he has performed his part of the production, the illustrations being well reproduced and printing and type clear and paper good, at a low price.

"Building Construction: Advanced and Honours Courses." By Charles F. Mitchell, assisted by George A. Mitchell. Third edition, revised and enlarged. London: B. T. Batsford, 94, High Holborn, W.C.; price 5s. 6d.

Correspondence.

Proposed Memorial to the late Mr. James Brooks.

To the Editor of THE BUILDERS' JOURNAL.

ST. FAITH'S VICARAGE, STOKE NEWINGTON, N.

SIR,—From several quarters it has been brought to my notice that a feeling exists that steps should be taken to raise some memorial to the late Mr. James Brooks, F.R.I.B.A.—this on account of the work he has done for the Church at large in many localities. I am led to write this on account of what he did for St. Faith's, a church designed by the late Mr. Burgess, at whose death Mr. Brooks completed, on his own responsibility, its western portion, and under his immediate care, or that of his son, Mr. Martin Brooks, carried out many additions and improvements, *e.g.*, vestries, porch, &c.; at the time of his death he was erecting the Lady Chapel. For the last twelve years, with one single intermission, he acted as churchwarden of St. Faith's, and for the last six continuously as vicar's warden. It seems therefore natural that the memorial should be erected in St. Faith's. Various objects have been mentioned, such as a chancel screen, west window to be filled with stained glass, screen between the church and the chapel, also an institute with caretaker's house. I should be glad to have the views of your readers on the subject, but I feel the selection of the object must depend very much on the amount of subscriptions received, and, secondly, on the wishes of Mr. Brooks's own family. Subscriptions may be sent either to Mr. W. Jenkinson, 147, Albion Road, the parish warden, or to myself.—Yours truly, C. H. V. PIXELL.

R. I. B. A.

PRESIDENTIAL ADDRESS.

THE first general meeting of the session 1901-2 was held last Monday evening. The minutes of the previous meeting having been confirmed, Mr. Alexander Graham, hon. secretary, referred to the deaths of Messrs. W. Larner Sugden, Robert I. Bennett, Yeoville Thomason, Herbert Richard Lloyd, John Mackland, John Littlewood and James Brooks. He announced that Mr. Emerson, the president, had been elected a honorary member of the American Institute of Architects. He then moved a vote of thanks to Mrs. Cates for the very kind way in which she had carried out the bequests of her late husband to the Institute. This was seconded by Mr. R. Phené Spiers, and carried by acclamation. On the motion of Mr. John Slater votes of thanks were accorded to the various bodies and societies of Glasgow for the kindness displayed to members of the Institute at the recent general meeting held in that city.

Mr. W. J. Locke, the secretary, announced that Mr. Clement Osman Nelson had passed the examination qualifying him to act as district surveyor under the London Building Act, and that Mr. Andrew Montague Sharp, of Montreal, Canada, had passed the Colonial examination qualifying as associate.

Mr. William Emerson then delivered his presidential address. He said :—

Our numbers maintain a steady increase; we have about 1,700 actual members—or over 3,000 members, counting those of societies in alliance with us. There are also some 1,500 probationers and more than 400 students.

The widening of Piccadilly was stated to be only a part of a large improvement scheme for that particular approach to the City from Kensington in which the taking down and rebuilding of Walsingham House would afford an opportunity for a move in that direction. Whether this is so I have no knowledge; but the question I would ask is, why deal with only one small portion of London at a time? The whole question of the rebuilding of London, enormously difficult as it may be or the huge expense it may involve, ought now without further delay to be considered. Definite improvements and building lines should be laid down in all important directions, and all buildings pulled down and rebuilt or altered in the future should be obliged to conform to the scheme.

A great deal has been written of late in some of the journals on the subject of assessorships in competitions, and evidently without knowledge of the truth of the matter or troubling to ascertain it. The suggestion has been that the blame of the dissatisfaction so constantly arising as to awards lies at the door of the president or Council of the Institute for not having exercised sufficient care in the selection of assessors. I have therefore had a list made of the competitions held since July, 1899, up to September last, with the assessors' names and the results, and I find there have been ninety-seven competitions held in all parts of the country. Out of this number there were seventy-three in which the authorities chose their own assessors, or, at any rate, did not apply to the Institute to name one. Out of these seventy-three the assessors' awards were set aside, and dissatisfaction was expressed in twelve cases, or, practically, one in every six competitions. In the remaining twenty-four the president of the Royal Institute of British Architects, or the Council in a few instances, nominated the assessors, and in not a single instance was the award of these assessors set aside, nor can I find that any expression of dissatisfaction arose at their awards. I think this proves how ready some even of our own members are to blame either the management or the officials of the Institute when they do not even know the facts about which they are writing or talking. A little more loyalty and real honest endeavour to serve the ends for which we are all supposed to be united and working would be more to the point and assist materially the work of the Institute for the good of our art and the profession at large.

This examination of the result of the enormous number of competitions in a couple of years only is enough, I should think, to deter most men in the profession from taking part in them; but if not—and if we choose to have it so—we should bear in mind that in every competition the larger proportion of the competitors must naturally feel disappointed, as there can only be one winner; and if a man does not care to take this risk he should not compete. If the public continue to lay the burden of competition on the profession, and we prefer to bear this burden of enforced gambling, then at least let us be fair amongst ourselves and insist that nothing shall upset the principle we have long ago laid down—that when a duly qualified assessor has been appointed and has selected a particular design the author of that design shall, unless there be some very special reason to the contrary, be employed to carry out the work. Otherwise we are simply playing into the hands of an unscrupulous public, prepared to take every advantage of our time, talents and money. Even should the assessor happen to make an award that does not commend itself to all, it will certainly be better for the profession in the long run that the award be upheld than that each dissatisfied competitor should endeavour to upset it. Our only safeguard is loyally to uphold this principle.

I wish to suggest an alteration in our accustomed church or cathedral arrangements, with a view possibly to induce at some later date a discussion on the point of bringing altars forward, nearer to the congregations, than is possible with the present arrangement of deep chancels and choirs. In 1884 I wrote in one of the building journals some thoughts on church-planning, the object of which was to show that the common fourteenth-century plan, with the crossing blocked by large piers and the enclosed choirs in the centre of the church, though well adapted for the mediæval and monastic times, is quite unsuited to modern worship in the nineteenth century. This view now seems generally accepted; but further than this, the fervent spirit that has developed itself under the Church revival of late years renders it necessary that the large congregations should be able both to hear and see all parts of the services for full participation in them. What is wanted now is a large open space for worshippers, with the altar brought well forward, and not buried in the depths of a lengthy chancel or choir, as in the case of the fourteenth-century English cathedrals, of which type the new one at Truro is a modern representative, and, however good in its architecture, is simply an anachronism. Tradition and conservatism are well in their way, but should not go to the length of hampering modern requirements with obsolete arrangements made for the benefit of colleges of monks and not for the people. The desirability of a good open space for congregational purposes is now by most thoughtful minds generally conceded. The point I would suggest for reflection is the possibility and propriety of a further advance in increasing the facilities of large congregations for seeing and hearing, and participation in those parts of the services conducted at the altar, by an alteration in its position, which might, while being a step in advance towards meeting modern congregational wants, possibly also be found to be in a measure almost a return to early usage.

The question I ask is, conceded the open space in the centre of a large church, why should we not consider the advisability in the future of altering the arrangement of our choirs and placing the altar at the entrance to the choir instead of at the east end, with the clergy choir and bishop's throne behind the altar?

The seats for the clergy being situated behind the altar is a far older arrangement than the position assigned to them in the mediæval and monastic times. It existed at first in some of our own early cathedrals, as you all know—at Norwich and Canterbury, for instance. I believe I am right in stating that the view of the Anglican party in the Church is that their rules, doctrines and worship are intended to be in accordance with those of the earlier Church, and go back to the time before the Bishops of Rome established the Roman Church as the chief of all the churches and arrogated to themselves the position of supreme head as Pope or Father. Now at this early period it is certain that the arrangements in the Christian churches provided for the altar being immediately in front of the congregation, and the seats for those who officiated at the various offices and at the altar behind it. In the early basilican arrangement it was evidently thought desirable that no great distance should intervene between the congregation and the altar, and for this reason no doubt it was placed in front of the Bema, thus bringing it in close proximity to the worshippers. In those days the form of worship was comparatively simple, and the officiating clergy, who probably acted as cantores also, were seated behind the altar, their seats being ranged around the Bema, with the bishop's throne in the centre, and the worshippers evidently took full part as well as the clergy in the ceremony of Divine worship.

Some few centuries later, when, in consequence of the holy mystery of the Divine Sacrifice being more prominently suggested in the church arrangements, indicated by the veiled altars, the ritual had extended and comprised more ceremonial, and more attention was paid to music, the addition of a chorus cantorum or choir was made, intervening between the altar and the congregation and jutting into the nave. The clergy still occupied the same position behind the altar during the missa and officium divinum, but subsequently those in holy orders, as well as the cantores, occupied the lower portion of the choir during the officium divinum, and those only actively engaged in the missa occupied the Bema.

One evident reason of the choir being thus brought forward into the nave between the altar and the congregation in the basilican churches, as in the upper church of San Clemente and others, seems likely to have been that had the increased number of singers been placed, like the priests, behind the altar, it would have necessitated in such a plan the position of the altar being moved some bays down the church, towards the centre of the nave, by which arrangement many of the worshippers in the large aisles would have found themselves during the missa behind the altar and the officiating priest, instead of in front.

It seems to me there could have been no other logical reason for the departure from the first method of arrangement, which brought the altar in greater proximity to the congregation; and from this departure by gradual steps our mediæval choirs were evolved, resulting eventually in the abbey churches in the entire shutting off of the altar, clergy, brotherhoods and choirs from the congregations by the elaborate screens even now remaining in many churches both here and abroad.

It was then found necessary to place in the nave, outside the choir, or rood screen, an altar, as at Lincoln and York, for the popular services. There was a great screen between the western piers of the central tower, the altar in the middle and doors on either side. A necessity for this altar for popular or congregational services is felt at the present time in some of our cathedrals, as at Norwich, in consequence of the enclosed choirs still remaining.

Does it not seem evident, from the variations at different times of the arrangements made to suit the feelings and education of the ages, that there can scarcely be said to be a hard-and-fast line drawn, or any grave law that would be broken if the present plan of accommodation of our tripartite arrangement of congregation, choir and sacrarium were somewhat altered to meet modern requirements, however much in some respects our sentiment and conservative feeling make us averse to alterations?

Mr. J. Macvicar Anderson, in proposing a vote of thanks to Mr. Emerson, referring to the question of competitions, said he disagreed with them altogether. He thought Mr. Emerson should have been appointed architect of the new Liverpool Cathedral, as the author of the best design in the previous competition.

Mr. G. H. Fellowes Prynne seconded the vote, and strongly endorsed Mr. Anderson's remarks regarding Liverpool Cathedral.

The vote having been accorded, Mr. Emerson in reply, said he was of course naturally disappointed with the result of the previous competition, but he thought the Liverpool Cathedral committee were only actuated by a desire to obtain the best design possible, and he would be glad if such were better than his own. He had long ago abandoned the idea of the scheme ever maturing during his lifetime.

BUILDING CONSTRUCTION.

(*Continued from p.* 203 *of No.* 351.)

THE student should note any examples of trusses which he may see in railway-station roofs, &c. He should pay particular attention to the cross-sections of parts, and also to the way in which the connections are made at the joints, and he should compare the actual things he sees with drawings given in books and any practical designs which may reach his hands. He has to consider not merely what is strongest and best, but what can be most easily made by the smith or other workman so that the cost will not be too great.

27. If a roof-covering consists of common rafters, sheeting and slates resting on the purlins which bear upon the trusses, it may be seen that it may be to a considerable extent self-supporting. Suppose we have a rectangular area covered by a slated roof hipped at the ends. If we make a stiff paper model of this roof-covering we shall find it self-supporting within limits of size. We may look upon a side of a roof of this kind as being a very deep thin girder bearing along its whole bottom edge, and then laid over to the angle of the roof; if now we have a stiff ridge well supported on the hip-rafters and mitred sheeting, &c., it will stand well against the pull of the sides. The weight of the sheeting will make it curve inwards; and instead of the thrust outwards to the walls which is usually provided for, there will be a dragging inwards. I do not desire to give undue weight to these considerations, but the student should, while paying all proper respect to the usual ways of looking at things, try to look at them in ways of his own. I specially caution young students that they should guard against the idea that they have invented some new thing when they think out arrangements somewhat different from what appears to be the common arrangement. If the roof is made strong enough, assuming that it spans from top to top of two parallel walls, it will certainly be strong enough for any other condition. For moderate spans it is sufficient to rest the trusses on sufficient plates to distribute the weight on the masonry or brickwork, but it must be remembered that the ends of any truss are subject to horizontal motions. In the case of iron trusses, the iron being a good conductor of heat, variations of temperature very considerably affect them—the trusses lengthen and shorten appreciably, or if prevented they are subjected to great stresses, or they must buckle or yield in parts. Any kind of truss varies in length, being strained with heavy loads and less strained with lighter loads, during the course of a storm. We may think of these horizontal movements either as a creep of the bearing of the truss on the top of the wall or, if the pressure and friction are great, as producing rocking or bending movement of the wall. It is sometimes assumed that if a truss rests on roller-bearings it gives a true vertical load to the wall, but this is not so; roller bearings only diminish the friction; they do not do away with it altogether. As a rule, such bearings are never examined; the plates get rusty or dust covers them, and the bearings are never free. There is some danger of the truss creeping more in one direction than the other. Thus, suppose a truss to lengthen 2in. It may make this 2in. at one end, and when it comes back to its normal length it may drag this 2in. from its other bearing; it may be prevented going too far by the roof structure confining it, but it may in this way put evil stresses on the structure. A better plan in important cases is to make the ends of the trusses rest on short stirrups or shackles which hang from the plates which distribute the load on the masonry. The reactions where stirrups are used may not be exactly parallel in all conditions of loading, but they may be made approximately so. It is useful to remember that the shearing strength, the tensile strength, and the crushing strength of iron are nearly equal, and for trusswork the safe load may be taken at 4 tons per sq. in. of section. A bar of iron 1yd. long and 1 sq. in. in section weighs 10 lbs., or a square foot 1in. thick weighs 40lbs. Remember that struts must be of such sections as will strengthen them to prevent bending sidewise, and that when struts are long they must be heavier than the 4 tons per sq. in. rule would allow them to be; because on the strut being stressed any slight irregularity in symmetry of section, or want of homogeneity in the iron, will allow the line of thrust to lie to one side of the centre of gravity of a cross-section, and consequently the whole of the section is not available to withstand the thrust.

28. We have to design iron trusses for a roof of 30 degs. pitch; span of truss, 72ft.; roof-covering, slates on sheeting (1in.), on common rafters (5in. by 2in.), purlins (7in. by 4in.); trusses spaced 10ft. apart; trusses to carry the whole weight of the roof and ceiling, below ties of trusses; ceiling on 5in. by 2in. joists, resting on pieces 9in. by 4in. suspended from joints along tie (at middle from apex).

Expansion.—The range of temperature may be taken at 50 degs. C.; the variation for this range may be taken to be ·0006, 72 × 12 × ·0006 = ·5184in., or slightly more than ½in.

To ascertain the load on a truss we must know its weight, and we cannot know its weight till we know the stresses in its parts. Assume a weight for the truss, and correct it by one or more trial calculations.

Assumed weight of truss - -	4,000 lbs.
Purlins - - - -	1,265 „
Common rafters - - -	2,188 „
Sheeting, &c. - - - -	3,225 „
Slates, &c. - - -	5,241 „
For one bay - - -	15,919 „
Ceiling - - - - -	10,080 „

Wind-pressure, 40lbs. per ft. super. at right angles to surface of roof on left side; total on bay, 16,800lbs. Pattern of truss, that of Fig. 29 (*see* last week's issue). The weight of the truss itself is dealt with as if it were distributed over the top joints, which of course is not the case; and the truss rafters are taken as jointed, which they are not.

First treat the truss represented by its skeleton lines as a rigid body. The loading as found above is distributed as shown on the drawing (Fig. 32). The line A H represents in magnitude and direction the balancing force which must be applied to the truss. Assume the reactions of the walls to be parallel, they will be parallel to this line, and their sum will be equal to it. To find the amount of the reaction at a take moments about a'.

2900 × 351 = 1017900
5 × 4000 × 240 = 4800000
2800 × 150 = 420000
5 × 1326 × 91 = 603330
5 × 1680 × 182 = 1528800

357)8370030(23445 lbs.
714
1230 etc.

The reaction at a is therefore 23,445lbs., and that at a' is 18,250lbs.

The truss is now dealt with as a jointed structure, and the stresses in its parts are found as shown in Fig. 32. It has been said (paragraph 25) that we can always determine two sides of a polygon if we are given the other sides and the angles of the polygon; and that if more than two sides are unknown the question is indeterminate. We find when we reach the middle joint on the left rafter that we appear to have a case of this indeterminate kind, and if the joint was unconnected with other joints it would be indeterminate; we find, however,

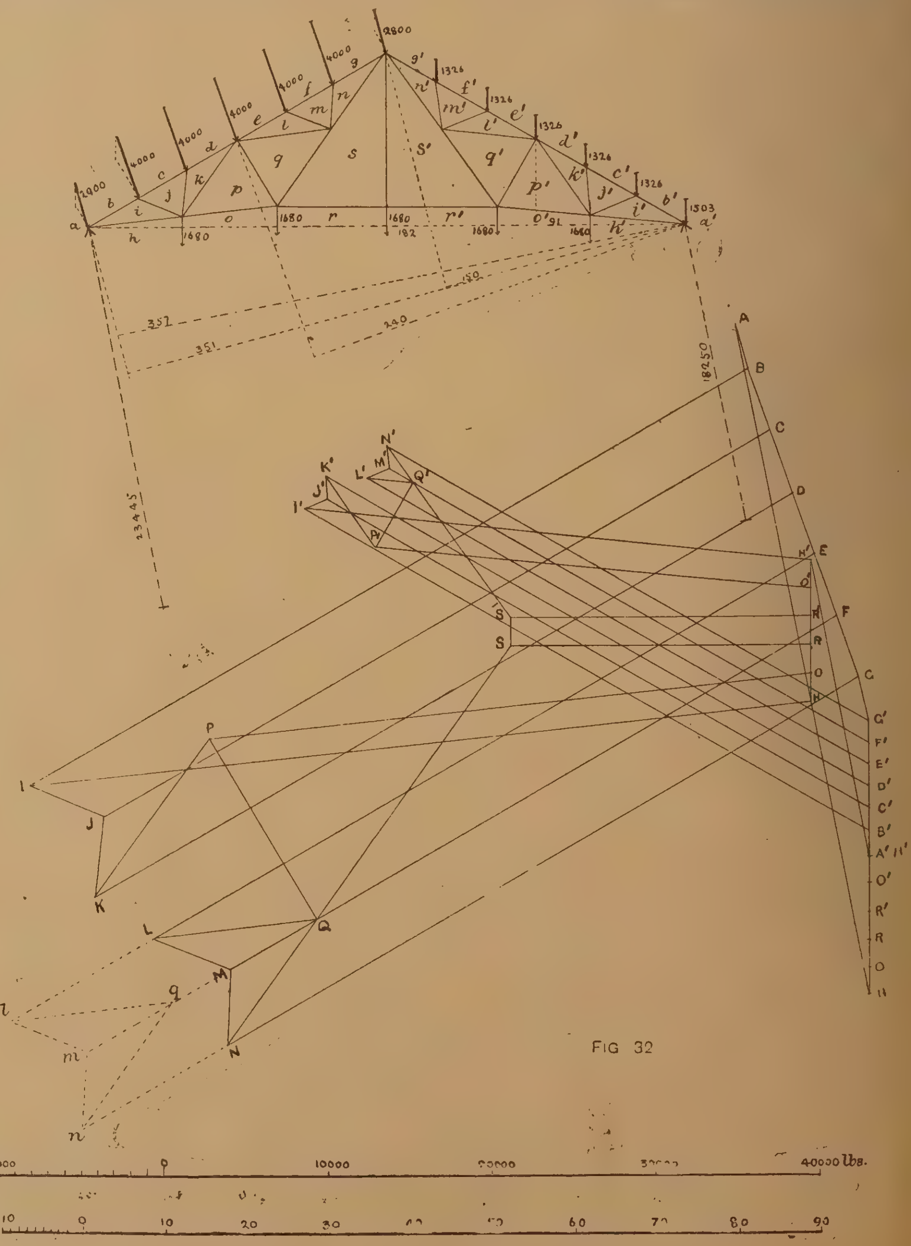


FIG 32

that its relation to the other joints of the truss enables us to determine the stresses in the members of this joint. We have found the point P, and we know the direction of P Q, for which we draw the line. Proceed round the joint in the direction with the hands of a watch and find K and D and E; but L we cannot find just yet. We know that it must be in the line E L; assume a point l, and from l draw $l\,q$ parallel to the member, but the length of $l\,q$ is not known; to find this length we draw $l\,m$, and because $l\,m$ is a member of the joint on the rafter, m must lie on the line F m; thus m is found. From m draw $m\,n$ parallel to the member; and for the same reason that m lies on F m, n' lies on G n; $n\,q$ may now be drawn. Now consider the joint $q\,l$, $l\,m$, $m\,n$, $n\,s$, $s\,q$. N, Q and S must be in the same straight line; the point l is therefore moved up to L, n is moved to N so that q rests upon the line P Q at Q. The point L has now been determined, and the remainder of the construction presents no difficulties. The student should notice that the polygon drawn to determine A H′ when the truss is considered a rigid body is made use of in the second part, where the diagram of stresses is drawn. When we reach the point marked A′ H′ in the stress diagram we know the reaction at a' and we draw it upwards to H′, and we draw from H′ downwards the loads on the joints of the tie and also the hanging load from the apex. When we reach the joint $i'\,j'\,c'\,b'$ there is only one stress to be found, and the drawing must satisfy the other stresses about the joint: in the case before us it does so fairly well, and we may assume that the drawing has been done with fair accuracy. It is seen that the stresses on the windward side are in every case greater than those on the lee side: the diagram shows the maximum stresses, and the members of the truss must be made to bear these *maximum stresses*. The rafters are in compression, but the rafters are held from bending sidewise by the purlins; from bending upwards by the weight of the roof; and from bending downwards by the members of the joints: each rafter may be taken to be a series of short struts, placed end to end. The only struts of more than moderate length and load are the two struts P Q. These struts are about 10ft. long, and their load is a little over 15,000lbs., say seven tons: if they were ties, a cross-section of less than 2 sq. in. would be sufficient; as struts it will be advisable to give them, say, 6 sq. in. in cross-section, or possibly more when we examine the conditions carefully; but this is a trifling matter. The struts $i\,j$, $j\,k$, $l\,m$, $m\,n$, are short and the loads upon them are small. Next take the maximum stresses in the several members in tons, divide these separately by 4 (four tons) to get inches of cross-section, making allowances for long struts; these quotients multiplied by the lengths of the members in ft. will give the number of ft. of a rod of iron 1in. sq. which would equal the iron in the truss; this divided by 3 will give the quantity in yards; and this multiplied by 10 will give the weight in lbs. Make a fair allowance for bolts, &c.—fastenings at the joints and bearings. The rough assumption of 4,000lbs. as the weight of the truss is sufficiently near the actual weight to make it unnecessary to substitute a corrected weight and to draw a fresh diagram.

Cross-sections.

Rafters 6 sq. in., cross-section say 2 angles 4in. by 4in.; small struts, 1 sq. in., cross-section say 2in. by 2in. angles; large struts, 6 sq. in., cross-section say 2 angles 4in. by 4in.

$h\,i$, $o\,p$, $q\,s$, and $n\,s$ may be all made of the same sectional area to have a joint at the lower end of P Q, sectional area 6 sq. in.—two straps 4in. by ¾in. each, swelled without loss of section for bolt holes at joints.

$r\,s$, 3 sq. in. cross-sectional area; 2 plates swelled at ends for bolts, 3in. by ½in.

Bearings and Joints.

The alteration in length from changes of temperature being as we found half an inch, a truss of this span may fairly be placed on stone or concrete templates without any provision for expansion further than the slight yielding of the walls or of the truss on its templates. A packing of indiarubber, if we could depend on the permanence of this substance, would be useful; thick felt pads may be placed between the bearing of the truss and the template; the ends of the truss may be supported on links. I hope to show sketches of the joints and bearings with the next article.

The working of this question shows the directness and simplicity of the method followed in these articles. The expedients sometimes adopted to evade the general method, as taking the wind-load separately from the other load, assuming the reaction of one wall vertical, &c., introduce complications and burden the memory. It may interest students who have hitherto followed drawing-card methods to account for the small differences which appear in these diagrams from those to which they have been accustomed. I have not patience for such an exercise myself; but in a book of diagrams before me it would appear that when the wind-pressure polygon and load polygon are taken separately, and the reactions compounded on the walls, these compound reactions are never parallel.

(*To be continued.*)

Law Cases.

Fire Escapes from High Buildings.—At Westminster last week, under the provisions of the London Building Act, 1894, Mr. W. Reekards, the building owner of a large block of high buildings let as flats at Buckingham Gate, was summoned for penalties for allowing occupation of the storeys over 60ft. from the ground level without a County Council certificate that there were adequate means of escape in case of fire. At present staircases were the only means of escape. Last July the defendant was fined at this court in respect of these flats. Fresh plans had been submitted since, but they were incomplete and unacceptable. Mr. Biron, counsel for the defendant, said that a builder was placed in a position of great difficulty because no definition of what was actually required could be obtained from the County Council officials. The defendant was most willing and anxious to do all the Council demanded, and for plans to be approved he asked for an adjournment. Mr. Horace Smith thought that this was reasonable, and granted a month's adjournment.

Re Sydney Knight.—A first meeting of the creditors of Sydney Knight was held last week. The debtor had carried on business as a builder and contractor at 347, New King's Road, Fulham, S.W., and he furnished a statement of affairs showing liabilities £38,318, of which £3,224 17s. 3d. was returned as unsecured, and assets estimated to produce a surplus of £689 2s. 4d. It appeared that the debtor had failed on a previous occasion. In 1897 he embarked on building speculations for the erection of flats, &c., at Hurlingham and Wimbledon, and he also erected houses at East Sheen and Walham Green. He endeavoured to sell the flats to a company, but states that his endeavours were unsuccessful owing to the war. He does not consider that he is insolvent, and attributes his position to undue pressure by creditors, and to other causes. No offer of composition was now made, and Mr. F. W. Davis, chartered accountant, was nominated as trustee to administer the estate in bankruptcy, a committee of inspection being appointed.

Notifying Completion of Buildings.—At the Birmingham Police Court on October 25th Thomas Wright, 342, Bristol Road, was summoned for failing, within a reasonable time after the completion of a building in Moor Street, to send a written notice to the surveyor that the work was completed. He was fined 20s. and costs, and a similar amount for occupying the premises.

Building Sites.—At Rotherham West Riding Police Court on October 28th George Pugh, builder and contractor, of Rawmarsh, was summoned at the instance of the Rawmarsh Urban Council for two breaches of the council's building by-laws. The case for the prosecution was that Pugh had not, in accordance with by-law 10, asphalted or covered with a layer of good cement the site of a building he had erected in Wheatcroft Road, Sandhill, Rawmarsh, and also that he had not used proper mortar. A fine of £5 was imposed for the breach of by-law 10, and a fine of 20s. in respect of the other by-law. There were also £4 4s. costs.

Fireproof Construction in Tenements under the L.B.A.—At Marylebone on October 27th, Alfred Bush, of 6D, Ridgmount Street, Gower Street, appeared to a summons, issued at the instance of Mr. Arthur Ashbridge, district surveyor for Marylebone, for making, in the erection of a building at the corner of Paradise Street and Ashland Place, Marylebone, default to comply with a notice of irregularity under the Building Act. The building is the property of the Portland Industrial Dwellings Co., and is intended for occupation by artizans. It was agreed on both sides that, the building being over 125,000 cub. ft. in extent, section 68 of the London Building Act applied. It was provided by that section that in every public building, and in every other building of more than 125,000ft. of cubical extent, which was constructed or adapted to be used as dwelling-houses for separate families, the floors of the lobbies, corridors, landings and flights of stairs should be of fire-resisting material and be carried on supports of a similar material. But it was also contended by the complainants that the building, being over 25 squares, or, in other words, covering more than 2,500 super. ft., should conform to section 74, subsection 3, which required that all the floors of the rooms, as well as those of the lobbies, &c., should be fireproof. Apart from that matter no exception was taken to the building. Mr. Moyses urged that section 74, subsection 3, only aimed at large buildings like flats, containing three or four rooms, intended to be occupied by different persons, and with an outer door. The object of the company he represented was to solve the most acute problem of finding dwellings for the industrial classes in congested districts. Every one of the rooms in the building in question might be let off separately. They therefore thought it was oppressive and unreasonable to try and compel them to incur the great expense of making the floors of even the smallest rooms fireproof. Mr. Plowden, in deciding the case, said that the whole question seemed to be what was a fair meaning to be placed on the words of the Act that in every building "containing separate sets of chambers, offices or rooms" there should be fireproof floors. In his opinion "separate sets" had nothing whatever to do with offices or rooms, but referred simply to chambers. Every kind of room, office or set of chambers which was inhabited at all should therefore have fireproof floors. Consequently he held that this building contained sets of chambers or rooms, or, even if not sets, they contained rooms which required fireproof floors. His order would be that the defendant should comply with both section 74, subsection 3, and section 68 of the Act, and pay £5 5s. costs.

Defective Gulley Gratings.—The case of *Jones* v. *Mayor and Corporation of London* was heard last week in the King's Bench Division of the High Court of Justice. Plaintiff claimed damages for personal injuries alleged to have been sustained through the negligence of the defendants. The Corporation denied negligence, and pleaded that they were liable for misfeasance only, and not for non-feasance. The case raised an important question as to the liability of local authorities. Plaintiff stated that on November 27th last, whilst hurrying down Fleur de Lis Court, he fell down a rainwater gulley, some parts of the grating of which were between 1½in. and 2in. below the level of the road. Mr. Justice Darling said in his opinion there was a case to go to the jury, having regard to the case of *White* v. *Hindley Local Authority*. In that case the late Lord Blackburn said: "The placing of this grating over the opening from the road into the sewer evidently was done with two objects—one to prevent the hole from being dangerous, and the other . . . to prevent stones and other matter from passing through. One purpose was, therefore, a road purpose, and the other a sewer purpose; and the grating being there for both purposes, the defendants have at least a joint liability with themselves as surveyors of highways in their capacity of owners of the sewers." There was in this case some evidence that the defendants had not kept the grating in a proper state, and, according to the decision he had cited, they might be liable as owners of the sewers, though not as surveyors of highways. The jury found a verdict for the plaintiff, and assessed the damages at £60.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Nov. 7	Rothes, Scotland - Cottage	—	J. Smith, Estate Office, Elgin.
,, 7	Newmarket - 75,000 Blue Bricks	Urban District Council	J. W. Metcalf, Surveyor, Town Hall, Newmarket.
,, 8	Leamington—Cottage at Pumping Station & Cart Shed	Corporation	Borough Engineer, Town Hall, Leamington.
,, 8	Aberystwyth—Rebuilding Cycle Shop	—	T. E Morgan, Architect, Aberystwyth.
,, 8	Great Grimsby—Seven Dwelling Houses	Co-operative Society, Ltd.	A. Gooseman, 112 Cleethorpe Road, Grimsby.
,, 8	Glasgow—Mason, Slater, Plasterer and Tile Work to Halls, Library and Police Office in Kingston District.	Corporation	Office of Public Works, City Chambers, 64 Cochrane St., Glasgow
,, 8	Hunstanton—Terrace of Houses	—	W. Wren, Surveyor, Pleasant Villa, Mount Pleasant, Cambridge.
,, 8	Blair, Fintray—Cottar House	J. Singer	A. Stronach, junr.. & Son, 20 Belmont Street, Aberdeen.
,, 9	Hayter Rock, Ilsington—Stables and Coach House, &c.	Messrs. Hellier	S. Segar, Architect, Newton Abbot.
,, 9	Hunton, Bedale—Alteration to Cloak Room	School Board	T. F. King, Edgley, Leyburn.
,, 9	Dublin—Cement, Slates, Firebricks, &c.	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
,, 9	Barnton, near Northwich—Police Station	Chester County Council	H. Beswick, County Architect, Newgate Street, Chester.
,, 9	Bradford—Two Dwelling Houses	Corporation	F. E. P. Edwards, City Architect, Chapel Lane, Bradford.
,, 9	Streatley and Goring, Oxon—Repairing Bridge	Commissioners	F. E. Hedges, Clerk, Market Place, Wallingford.
,, 11	Aston Manor, Birmingham—Electric Power Station	Urban District Council	R P. Wilson, 66 Victoria Street, Westminster.
,, 11	Lossiemouth, Scotland—Mason Carpenter, Slater and Plasterwork to Hotel.	—	R. P. Peratt, Architect, Town and County Bank Buildings, Elgin.
,, 11	Wombwell, near Barnsley—Church and Schools, &c.	Primitive Methodist Connexion	J. P. Earle, Architect, Norfolk Chambers, Norfolk Row, Sheffield.
,, 11	Millshaw, Beeston—Brickwork in Extension of Leather Factory (Labour only).	W. J. Ingle	T. A. Buttery and S. B. Birds, Queen Street, Morley.
,, 11	Bournemouth—Car Sheds and Repairing Shops	Town Council	F. W. Lacey, Engineer, Municipal Offices, Bournemouth.
,, 11	Nelson, Lancs—Schools	School Board	T. Bell, Architect, Grimshaw Street, Burnley.
,, 11	Mansfield—Electricity & Refuse Destructor Works, &c.	Town Council	Vallance & Westwick, Architects, Mansfield.
,, 11	Wainfleet, All Saints—Three Villas	Captain J. Lilly	J. Bassitt, Barkham Street, Wainfleet.
,, 12	Kingston—Kiosk on Beech	Urban District Council	J. Donelly, Clerk, Town Hall, Kingstown, Ireland.
,, 12	Plymouth—Additions and Alterations at School	School Board	H. J. Snell, 11 The Crescent, Plymouth.
,, 12	Plymouth—Mason's Work, &c., at Dispensary	Guardians	W. Adams, 13 Princess Square, Plymouth.
,, 12	Southend-on-Sea—School Addition	National School Managers	W. Y. Hobbiss, 57 High Street, Southend-on-Sea.
,, 12	Cleator Moor—Butcher's Shop, Slaughterhouse, &c.	Co-operative Society, Ltd.	Central Office of Society Cleator Moor.
,, 12	Ilford—Tramway Car Sheds, Workshops, &c.	Urban District Council	H. Shaw, 7 Cranbrook Road, Ilford.
,, 12	Dover—Infirmary and Nurses' Home at Workhouse	Union Guardians	Cresswell & Newman, 54 Castle Street, Dover.
,, 12	London, S.W.—Public Offices	H.M. Commissioners of Works	H.M. Office of Works, Storey's Gate, S.W
,, 13	Deal—Engine House, Boiler House and Coal Store	Joint Water Board	T. & C. Hawkesley, 30, Great George Street, Westminster, S.W.
,, 13	Tyne Dock—Re-roofing and Extension of Waggon Works, including Mess Room and Office.	North-East Railway Company	W. Bell, Company's Architect, Central Station, Newcastle-on-Tyne.
,, 13	Wandsworth, S.W.—Bakehouse, &c, at Workhouse	Union Guardians	W. C Poole, Architect, Prested Road, Clapham Junction, S.W.
,, 13	Fulham, S.W.—Branch Library	Borough Council	C. Botterill, Borough Surveyor, Town Hall, Fulham, S.W.
,, 13	Lewes—Six Houses	Co-operative Society, Ltd.	T. W. Franks, Architect, Lewes.
,, 13	Castleford—Five Terrace Houses	—	R. M. McDowell, Architect, Carlton Street, Castleford.
,, 14	Castleisland, co. Kerry—Church Tower and Spire	—	D. J. Coakley, 1 Charlotte Quay, Cork.
,, 14	Bryn, nr. Port Talbot—Seating, Pulpit, Choir, Stalls, &c.	—	F. B. Smith, Architect, Port Talbot.
,, 15	London, S.E.—Plain Iron Mission Church to seat 250	—	Rev. J. Ferguson, 10 New Cross Road, S.E.
,, 15	Birmingham—Building Materials	Kynoch Limited	Secretary, Kynoch Limited, Witton, Birmingham.
,, 16	Runcorn—Six Fire-Escape Stairs at Workhouse	Union Guardians	G. F. Ashton, 71 High Street, Runcorn.
,, 18	Vickerstown, Barrow-in-Furness—5 Shops and Houses	—	Isle of Walney Estates Co., Ltd. Walney, Barrow-in-Furness.
,, 18	Leeds—Engine House, Stabling, &c., at Fire Station	Watch Committee	P. Robinson, 72 Albion Street, Leeds.
,, 18	Drum—Renovation of Parish Church	Incumbent and Churchwardens	Drum Glebe.
,, 18	Hayle—School Buildings and Alterations to Chapel	Foundry Wesleyan Chapel Trustees	S. Hill, Architect, Green Lane, Redruth.
,, 18	Heston and Isleworth—Tweny-two Workmen's Houses	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow.
,, 19	London—Carpenters', &c., Jobbing Work for three years	Corporation	Engineer, Public Health Department, Guildhall, E.C.
,, 19	Blaenavon, Mon—Sliding Glazed Partitions, New Desks	School Board	Lansdowne & Giggs, Metropolitan Bank Chambers, Newport, Mon.
,, 20	Darlington—Enlargement of Head Post Office	Commissioners of H.M. Works	H.M. Office of Works Storey's Gate, S.W.
,, 20	Kew—Wing of Herbarium in Garden	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.
,, 20	Brentford—Isolation Hospital, with Administrative Buildings, &c.	Chiswick Urban District Council	A. Ramsden, Surveyor, Town Hall, Chiswick.
,, 20	Dartmouth—Offices and Dwelling House	Channel Coaling Co., Ltd.	Company's Offices, South Embankment, Dartmouth.
,, 21	London, E.C.—Building Materials	London General Omnibus Co., Ltd.	Coach Factory, 235 Upper Street, Islington, N.
,, 22	Newbridge, near Ruabon—House, Out-Offices, &c.	—	W. H. Johns, Architect, Vroncysyllte, Llangollen.
,, 22	Ystalyfera and Pontardawe, Wales—Schools	Llanguicke School Board	W. W. Williams, 63 Wind Street, Swansea.
,, 23	Leeds—Free Library	Library Committee	W. Bakewell, 38 Park Square, Leeds.
,, 25	Horwich—Infectious Diseases Hospital	Hospital Committee	T. Partington, 117 Market Street, Westhoughton, Bolton.
,, 28	Askam in-Furness—Sunday Schools	Rev. W. Carr	Rev. W. Carr, Slater Terrace, Dalton-in-Furness.
,, 29	Gloss Links, near Bamburgh—Coastguard Buildings	Admiralty	Director, Works Dept., Admiralty, Northumberland Avenue, W.C.
Dec. 2	Belfast—Assembly Buildings	General Assembly of Presbyterian Church	W. H. Stephens & Son, Donegall Square Buildings, Belfast.
,, 2	Cardiff—Additions to Warehouses	J. Isaac & Sons	E. G. C. Down, 31 High Street, Cardiff.
,, 2	Farnborough, Hants—Residence and Stabling	—	W. E. Trevena, Ridgemount, Southampton Rd., Farnborough, Hants.
,, 10	Conisborough—Isolation Hospital	Doncaster and Mexborough Joint Hospital Board.	J. H. Morton, 50 King Street, South Shields.
No date.	Dumfermline—Extension of Post Office	Commissioners of H.M. Works	H.M. Office of Works, Edinburgh.
,,	Conisborough, Yorks—School and Caretaker's House	School Board	G. White, Architect, Mexborough.
,,	Peterborough—Banking Premises, Offices, and Caretaker's Residence.	Midland Counties District Bank, Ltd.	W. Bower, 10A Cowgate, Peterborough.
	ENGINEERING:		
Nov. 7	Blaydon-on-Tyne—Laying Cast-iron Water Pipes	Urban District Council	G. Symon, Surveyor, Council Offices Blaydon.
,, 7	Luton—Pump and Motor	Town Council	A. T. Snell, St. Mary's Road, Luton.
,, 7	South Queensferry—Repairs to Steamship Machinery	—	Commanding Officer, H.M.S. "Anson," South Queensferry.
,, 8	Hindley—120 tons Natural Oxide of Iron	Urban District Council	W. Dickinson, Manager, Gas and Water Works, Hindley.
,, 8	Rochdale—Three Lancashire Boilers, &c.	Corporation	Lacey, Clireaugh & Sillar, 78, King Street, Manchester.
,, 8	Glasgow—Heating Halls, Library and Police Office	Corporation	Office of Public Works, City Chambers, 64, Cochrane St, Glasgow.
,, 9	Droxford, Hants—Laundry Drying Closet and Ironing Stove.	Union Guardians	F. Clark, Clerk, Bishop's Waltham.
,, 9	Dublin—Railway Stores	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
,, 9	Streatley and Goring—Repairing Bridge	Commissioners	F. E. Hedges, Clerk, Market Place, Wallingford.
,, 11	Willowholm, nr. Carlislle—Underbridge Superstructure	Caledonian Railway Company	Company's Divisional Engineer, Princes Street Station, Edinburgh
,, 12	Hurst, near Ashton-under-Lyne—Electric Cables, &c.	Urban District Council	E. Garside, Engineer, Town Hall Chambers, Ashton-under-Lyne.
,, 12	Rotherham—Wiring Hospital	Weekly Board	E. Cross, Borough Electrical Engineer, Rawmarsh Road, Rotherham
,, 12	Linlithgow—Sewage Tanks, Filter Beds, &c.	Town Council	Warren & Stuart, 94 Hope Street, Glasgow.
,, 12	London, S.W.—Covered Goods and Low-sided Railway Waggons.	Secretary of State for India in Council	Director-General of Stores, India Office, Whitehall, S.W.
,, 12	Barking, Essex—Electric Crane, &c.	Urban District Council	C. F. Dawson, Council's Surveyor, Public Offices, Barking.
,, 12	Swindon—Machinery and Electrical Plant	Corporation	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
,, 12	Dartford—Pumping Machinery	Urban District Council	W. Harston, Surveyor, High Street, Dartford.
,, 12	Cardiff—Reconstructing Bridges, &c.	Great Western Railway Co.	Engineer, Paddington Station, N.W.
,, 12	Rothwell, Northants—Waterworks	Urban District Council	W. T. Pearson, Surveyor, Bank Chambers, Rothwell.
,, 12	Willesden—Electrical Plant	Urban District Council	E. T. Ruthven-Murray, Electrical Engineer to Council, Public Offices, Dyne Road, Kilburn, N.W.
,, 13	Christiania—Two Steam Boilers	Norwegian State Railway Department	Direktor of Maskinafdelingens' Kontor, Statsbanerne, Christiania.
,, 14	Manorhamilton, Ireland—Water Supply Scheme	Rural District Council	P. Keany, Clerk, District Council Office, Manorhamilton.
,, 16	Chesham—Electric Lighting	Urban District Council	J. G. How, Clerk, Chesham.
,, 18	Bury, Lancs—Tramcars	Tramways Committee	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
,, 18	Girvan, Scotland—Storage Reservoir, &c	Town Council	J & H. V Eaglesham, Wellington Chambers, Ayr.
,, 19	London—Engineers' and Smiths' Jobbing Works (for three years).	Streets Committee of Corporation	Engineer, Public Health Department, Guildhall, E C.
,, 20	Wimbledon—Settling Tanks, &c.	Urban District Council	Council Offices, Broadway, Wimbledon.
,, 21	Easingwold, Yorks — Covered Concrete Reservoir (120,000 gallons).	Rural District Council	Fairbank & Sons, 13 Lendal, York.
,, 23	Boulder City, Western Australia—Electric Tramway	City Council	Agent-General's Office, London.
,, 25	King's Lynn—Tug	Conservancy Board	J. Pollock, Sons & Co., 22 Billiter Street, E.C.
,, 25	Dublin—Electrical Supplies, &c.	United Tramways Company	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
,, 25	Liverpool—Overhead Electric Equipment of Tramways	South Lancs. Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
,, 26	East London, South Africa—Electric Plant	—	Dyer & Dyer, 17 Aldermanbury, E.C.
,, 30	Clitheroe, Lancs—Sewage Settling Tanks, &c.	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*cont.*:		
Dec. 3	London, E.C.—Artesian Well at Baths	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Old Street, E.C.
" 6	Hull—Construction of New Dock (50 acres)	Joint Dock Committee	Sir J. Wolfe Barry & Partners, 21 Delahay Street, Westminster.
" 16	Ireland—Single Railway Line Viaduct over River Barrow.	Fishguard and Rosslare Railways and Harbours Co.	Sir B. Baker, 2 Queen Square Place, Queen Anne's Mansions, Westminster, S.W
" 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta
1902.			
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works, Sydney.
Mar. 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
	IRON AND STEEL:		
Nov. 7	Blaydon-on-Tyne—260 tons Cast-iron Water Pipes	Urban District Council	G. Symon, Surveyor, Council Offices, Blaydon.
" 7	London, E.C.—Wheels and Axles, Railway Metals, &c.	Burma Railways Co., Ltd.	Secretary, 76 Gresham House, Old Broad Street, E.C.
" 8	Hindley—100 Gas Grilles	Urban District Council	S. Holt, Clerk, Council Offices, Hindley.
" 9	Dublin—Railway Stores	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 11	London, S.W.—Rails, &c.	——	Agent-General for Victoria, 15 Victoria Street, London.
" 11	Lossiemouth, Scotland—Ironwork for Additions to Hotel.	——	R. B. Pratt, Architect, Town and County Bank Buildings, Elgin.
" 11	Manchester—Drain Covers	Rivers Committee	Secretary, Rivers Department, Town Hall, Manchester.
" 11	Willowholm, near Carlisle—Steelwork in Superstructure of Underbridge.	Caledonian Railway Company	Company's Divisional Engineer, Princes Street Station, Edinburgh.
" 12	Rothwell, Northants—Cast-iron Drains (250 tons)	Urban District Council	W. T. Pearson, Surveyor, Bank Chambers, Rothwell.
" 12	London, E.C.—Flexible Buffers and Screw Couplings	Burma Railway Co., Ltd.	Secretary, 76 Gresham House, Old Broad Street, E.C.
" 13	London, E.C.—Railway Stores	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Sec., Gloucester House, Bishopsgate St., Without, E.C.
" 13	Christiania—Rail Nails	Norwegian State Railway Department	Commercial Department, Foreign Office, S.W.
" 15	Birmingham—Iron and Steelware, Picks, Shovels, Nails &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
" 15	Witton, Brmnghm.—Bolts, Nuts, Tubes, Metalware, &c	Kynoch, Ltd.	Secretary, Kynoch Ltd., Witton, Birmingham.
" 25	Dublin—Iron, Steel Castings, &c.	United Tramways Co.	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
	PAINTING AND PLUMBING:		
Nov. 7	London, E.C.—Paints, &c.	Burma Railways Co., Ltd.	Secretary, 76 Gresham House, Old Broad Street, E.C.
" 8	Hastings—Painting Exterior of Police Station	Town Council	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 8	Glasgow—Painting and Plumber Work at Hall, Library and Police Office in Kingston District.	Corporation	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
" 8	Hope, near Eccles—Painting Outside of Infirmary	Salford Union Guardians	Steward, Infirmary, Hope, near Eccles.
" 9	Dublin—Colours, Oil, &c.	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 11	Lossiemouth, Scotland—Plumber and Painter Work in Additions to Hotel.	——	R. B. Pratt, Architect, Town and County Bank Buildings, Elgin.
" 12	Plymouth—Painting & Plumbing Works at Dispensary	Guardians	W. Adams, 13 Princes Square, Plymouth.
" 15	Birmingham—Brushes, Oils, Paints, Lead Piping, &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
" 15	Witton, Birmingham—Paints, Lead, Oil, &c.	Kynoch Ltd.	Secretary, Kynoch Ltd., Witton, Birmingham.
" 19	London—Plumbers' and Painters' Jobbing Works (for three years).	Streets Committee of the Corporation	Engineer, Public Health Department, Guildhall.
" 20	Manchester—Oil	Gas Committee	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
" 25	Canterbury—External Painting	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, High St., Canterbury.
" 25	Dublin—Paints, Brushes, &c.	United Tramways Co.	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
No date.	Girlington—Plumbing Work to eight Houses	——	R. Drake, 31 Pearson Lane, Girlington, Bradford.
	ROADS AND CARTAGE:		
Nov. 9	Manchester—Wagons	Tramways Committee	J. M. M'Elroy, 55 Piccadilly, Manchester.
" 9	Ince, Lancs—Street Works	Urban District Council	Winstanley & Ashworth, 42 Deansgate, Manchester.
" 9	Middleton, Lancs—Paving, &c.	Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton.
" 9	Pinner—Footpath	Parish Council	Down's Farm, Pinner.
" 11	Broadstairs—Norway Granite Channel and Kerb	Urban District Council	H. Hurd, Town Surveyor, Broadstairs.
" 11	Willenhall, Staffs—Road Works	Urban District Council	T. E. Fellows, Surveyor, Town Hall, Willenhall.
" 12	London, E.C.—Harness, &c.	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Town Hall, Old Street, E.C.
" 12	Walsall—4,000 to 5,000 tons of Granite Setts	Corporation	Borough Surveyor, Bridge Street, Walsall.
" 12	Fulham, S.W.—Wood-paving of Carriageway and Footway Paving.	Borough Council	C. Botterill, Borough Surveyor, Town Hall, Fulham.
" 16	Radcliff, Lancs—Planting Trees and Shrubs in Park	Urban District Council	W. L. Rothwell, Surveyor, Council Offices, Radcliffe.
" 20	Croydon—Highway Improvements	Rural District Council	R. M. Chart, Council's Offices, Town Hall, Croydon.
" 30	Johannesburg—Pavements	——	"The Times," London, E.C.
	SANITARY;		
Nov. 7	Rochdale—Lime	Gas Committee	J. Leach, Town Clerk, Town Hall, Rochdale.
" 7	Blaydon-on-Tyne—Sewerage Works	Urban District Council	G. Symon, Surveyor, Council Offices, Blayton.
" 9	Busby, Lanarkshire—Drainage Works	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
" 9	Dublin—Sewer Pipes	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 12	Bedlington, Northumberland—Sewerage Works	Urban District Council	C. Brown, Bedlington.
" 12	Linlithgow—Sewage Tanks and Filter Beds, &c., at Sewage Disposal Works.	Town Council	Warren & Stuart, 94 Hope Street, Glasgow.
" 13	Chepping Wycombe—Stoneware Pipes	Corporation	T. J. Rushbrooke, Borough Surveyor, Chepping Wycombe.
" 15	Heage—Sewage Disposal Works and Sewers	Urban District Council	Hunter & Woodhouse, Engineers, Belper.
" 15	Birmingham—Earthenware Drain Pipes, &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
" 19	London, E.C.—New Sewer in Gt. Saint Helens	Streets Committee of Corporation	Engineer, Public Health Department, Guildhall, E.C.
" 30	Clitheroe, Lancs—Two Setting Tanks on Sewage Farm	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.
	TIMBER:		
Nov. 9	Dublin—Timber	Great Northern Railway Co. (Ireland)	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 15	Birmingham—Timber, &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
" 15	Witton, Birmingham—Timber, &c.	Kynoch Limited	Secretary, Kynoch Limited, Witton, Birmingham.
" 18	Lisbon—Mineral Oil for Timber Injections	Royal-Portuguese Railway Co.	Company's Officer, 28 Rue de Chateaudun, Paris.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov. 14	Manorhamilton—Water Supply Scheme	——	P. Keany, Clerk to R.D.C., Manorhamilton, Ireland.
" 14	Kingston-upon-Thames—Public Library	——	H. A. Winser, Town Clerk, Kingston-on-Thames.
" 22	Barnsley—Guardians' Offices	£20.	C. J. Tyas, 17 Regent Street, Barnsley.
" 23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
" 23	Bexhill—Isolation Hospital	£25.	E. S. Douglas, Town Hall, Bexhill.
Dec. 17	Tywardreath—Board Schools	——	J. Cook, Clerk to School Board, Tywardreath, Par Station, Cornwall.
" 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902.			
Jan. 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No Date.	Northampton—Master's House and Boys' Boarding-House, &c.	25 guineas.	J. Haviland, 2 St. Giles Square, Northampton.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERCARN.—For the erection of a chapel, caretaker's house, outbuildings, fencing, and entrances (one contract) at their new cemetery, Abercarn, for the Abercarn Urban District Council. Mr. George Stevens, surveyor:—

Ledbeter Bros, Newport	£2,659
Davies Bros.,* Abercarn	2,645
J. Jenkins, Newport	2,579

* Accepted.

GREAT BERKHAMPSTEAD.—For the erection of five residences, North Road and Charles Street, for Mr. William Dwight. Mr. Charles H. Rew, Berkhampstead, architect:—

C. Brightman	£4,075
T. Tirrell	3,950
H. & J. Matthews	3,595
Nash, Young & Horne	3,866
Honour & Son	3,497
Jones & Sons,* Berkhampstead	3,305

* Accepted. [Architect's estimate, £3,300.]

HALE (CHESHIRE) — For construction of (approximately) 330 yards of 15-in. stoneware pipe sewers, 1,250 yards of 12-in. stoneware pipe sewers, 500 yards of 9-in. stoneware pipe sewers, together with the necessary manholes, lampholes, flushing valves, and other appurtenant works, for the Hale Urban District Council Mr. Frank J. Lobley, A.M.I.C.E., engineer, Albert Road, Hale:—

J Dale, Northwich	£6,129	7	0
G Bozson, Church Road, Ashton-on-Mersey	5,738	6	0
Bennie & Thompson, Warrington	5,481	14	0
Hamilton & Son, Altrincham	4,751	0	0
T. J. Hawkins & Co., Ashford, Middlesex	4,383	3	8
C. E. Carden, Penkridge, Stafford	4,332	2	0
H. Morecroft, Acton Green, London, N.	4,292	0	0
M. Naylor & Son,* Mytton Street, Hulme, Manchester	4,180	0	0
S. Johnson, Broom Hall, Irlams-o'-th'-Height	4,084	9	6
Gosling & Stafford, Hazel Grove, Stockport	3,643	2	6
J. Pickthall & Son, Darley Dale, near Matlock	3,195	8	0

* Accepted. [Engineer's estimate, £4,200.]

ILFORD.—For the erection of 7 houses, Henley Road, Ilford, for Messrs. Lowe & Co., Mr. A. W. Hudson, P.A.S.I., architect and surveyor, 87 Finsbury Pavement, E.C.:—

	Total.	Rate per House.
Messrs. Hawkey & Oldman	£2,373	£339
H. Wilson	2,170	310
B. Hart	2,1[illegible]5	305
T. Wilson	2,[illegible]51	293
Messrs. Wicks & Capon	1,78[illegible]	255

ILFRACOMBE.—For the construction of about 1,240 lineal yards of stoneware pipe sewers, 9in. to 15in in diameter, in High Street, Portland Street, Fore Street, Castle Hill, and Coronation Terrace for the Ilfracombe Urban District Council. Mr. G. M. Prouse engineer and surveyor:—

G. Parkin	£1,635	0
Bi ton & Pickett	1,627	12
R. Fry*	1,050	0

* Accepted. [All of Ilfracombe.]

MONAGHAN.—For the following works, for the Monaghan Urban District Council: construction of a storage reservoir at Togan, including all excavations, embankments, weirs, intake chamber, valve pit, fencing, and contingent works; construction of an aqueduct of about 4 miles 6 furlongs in length, consisting of 6-in. and 8-in. cast-iron pipes, with all sluice and air-valves, hatch-boxes, and other appliances; distribution system through the town and district of Monaghan, with all valves, hydrants, street fountains, &c.; construction of filter-beds, clear-water basin, gauge trough, valve pits, pipe-laying connected therewith, fencing, and contingent works; maintenance of the whole of the works for a period of 12 months after completion. Messrs. J. L. Devenish-Meares, C.E., Town Hall, Newry, and J. H. M. Wilson, C.E., Monaghan, engineers:—

J. Hemmingway, Bloomfield, Belfast	£8,589	16	10
W. Baird, Lower Abbey Street, Dublin	7,840	16	2
Mc ally and McKee, 25 Bailey's, New Street, Waterford	7,750	19	1
A. Whelan & D. Neary, Newry	7,671	13	7
Heggarty & Gault, Ballymena	7,617	3	4
G. L Johnston, Victoria Street, Armagh	7,591	4	4
Grisenthwaite & Newton, 18 Chatsworth Square, Carlisle	7,405	16	8
W. McMahon, Carnt te, Clones	6,745	3	7
P. Nolan,* Hill Street, Monaghan	6,616	19	6
P. Ritchie, 89 and 91 North Queen Street, Belfast	6,639	7	8

* Accepted.

MOXLEY.—For the erection of Cottages in Moxley, near Bilston, for Mrs. Phillips. Mr. F. B. Howarth architect, Town Hall Chambers, Bilston and Ellymore Road, Sedgley:—

B Fullwood* Sedgley	£56[illegible]
W. Porter†	640

* Accepted. † Withdrawn.

NEWQUAY (CORNWALL).—For the erection of new infant school buildings, alterations and additions to existing girls' school, &c., for the St. Columb Minor School Board. Messrs. Cowell & Cowell, architects, Central Chambers, Newquay:—

C. Carrwick	£3,975
Cocking & Jenkin	2,863
Hobbs & Son	2,800
W. S. Tippett	2,630
Trehane & Son*	2,600

* Provisionally accepted.

POOLE.—For the erection of a shop and three houses at Poole, for Mr. John Cross, of Poole. Mr. Ed. van Schepdael, architect and surveyor, Longfleet, Poole:—

J. Hillman, Parkstone	£1,033	18	4
T. C. Rigler, Poole	1,030	0	0
George Baker, Wimborne	928	7	8
E. J. S. Stokes, Poole	810	10	0
J. H. Wilson,* Parkstone	720	0	0

* Accepted.

PORTLAND.—For new reservoir at Portland:—

A. Willis & Sons, Bath	£7,575	6	0
Jesty & Baker, Portland	7,061	0	0
Pedrette & Co., London	6,323	0	0
J. A. Bartlett, Weymouth	5,790	8	1
B. Cooke & Co., London	4,187	0	0

NOTE.—The Council have decided to do the work with their own staff.

SHALFLEET (ISLE OF WIGHT).—For the following contracts in connection with the Shalfleet water supply, for the Isle of Wight Rural District Council: (Contract A) providing and delivering at Shalfleet 3,3 0 9-ft. lengths of 3-in. and 950 9-ft lengths of 4-in. cast-iron socket pipes with the necessary bends, branches, &c.; (Contract B) excavating for, carting, and laying about 9,99[illegible] yards of 3 in. and 2,850 yards of 4-in. cast-iron socket pipe, with the necessary bends, branches, &c., and the providing and fixing of sluice valves, hydrants, air valves, &c., and certain services. Mr. S. E. Tomkins, engineer, Newport:—

Contract A.

G Hayles, Shanklin, Isle of Wight	£[illegible],9[illegible]6	0	0
J. & M. Patrick, Gosport	1,[illegible]00	0	0
Cochrane & Co., Dudley	1,675	18	1
D. Young, Whitney	1,640	0	0
Rowland, Carr & Co., Lime Street Square, E.C.	1,575	1	11
T. Spittle, Ltd., Newport (Mon.)	1,532	12	0
J Gibbs & Co, Fenchurch Street, E.C.	1,525	0	0
W. Jones & Co., Poole, Dorset	1,507	7	6
Biggs, Wall & Co., Finsbury Pavement, E.C.	1,463	13	0
J. Abbot & Co., Laurence Pountney Hill, E.C.	1,453	12	7
N MacLaren & Co., Eglington Foundry, Glasgow	1,436	8	7
Cochrane, Grove & Co., Middlesbrough	1,395	9	1
R. Laidlaw & Son Cannon Street, E.C.	1,338	7	3
J. & R. Ritchie, Middlesbrough	1,363	0	0
A. G. Cloake, Holborn Viaduct, E.C.	1,289	6	0
J. C MacEwan & Co.,* St. Vincent Lane, Glasgow	1,357	10	0

Contract B.

F. W. Payne & Co., Staple Hill, near Bristol	£2,399	7	1
D. Young	2,344	6	5
J. & M. Patrick	2,129	0	0
G. Hayles	1,938	0	0
R. Buckett & Son, Freshwater, Isle of Wight	1,725	7	7
W. Jones & Son	1,678	4	0
H. Linington,* Wroxhall, Isle of Wight	1,[illegible]87	13	0

* Accepted.

SUNDERLAND.—Accepted for the proposed alterations to the "Foresters Arms," at Ryhope, for the Trustees of the late Joseph Johnson. Mr. Henry Grieves, architect, Albany Chambers, South Shields:—

Taylor & Welford	£247	18	6

SWINDON.—For the erection of buildings and chimney shaft for the Corporation electricity works in Corporation Street, including all excavations and foundations and the supply and delivery of all materials necessary for the construction of the works, for the Corporation:—

T. & J. Binns, Croydon	£9,500	0	0
F. & C. Sackman, Clifton Street	5,902	19	0
E. G. Minter, London	5,860	0	0
C. Williams	5,[illegible]92	14	3
C. Wilkins	5,621	8	5
A. J. Colborne * Newport Street	5,174	1	0

* Accepted. [Rest of Swindon.]

TREALAW, RHONDDA.—For the erection of 6 houses at Trealaw, Rhondda, for Mr. John George. Messrs. Griffiths and Jones, M.S.A., architects, Tonypandy:—

Mr. James Edwards, Gilfach-goch Glam	£950

WEST HAM.—For the erection of 40 double-tenement houses for the working classes in E e Road, Plaistow, for the Corporation of West Ham, Mr. J. G. Morley, borough Engineer:—

F. & E. Davey, Queen's Road, Southend-on-Sea	£23,885	0	0
General Builders, Ltd., Wharf Road, Notting Hill	21,797	0	0
F. G Minter, Page Street, Westminster	21,591	0	0
Martin, Wells & Co., 25 Auckland Street, Vauxhall	20,[illegible]59	0	0
Thomas & Gage, Anglesea Avenue, Woolwich	2[illegible],511	0	0
J. W. Jerram, Boundary Road, East Ham	18,678	0	0
Herbert Bros., Corporation Street, West Ham	18,139	0	0
A. T. Haines & Co., Manor Road, West Ham	17,135	19	2
Gregar & Son Jupp Road, Stratford	17,530	0	0
Barker & Co. Ltd., Kensington, W.	16,3[illegible]0	0	0
G. Wise, works manager, West Ham	16,[illegible]93	0	0
H. J. Carter,* Grays	16,740	0	0

* Accepted.

WHEATLEY (OXON).—For the construction of sewers, settling tanks, &c. Mr George Winship, F.G.S., engineer, 21 St. Michael Street, Oxford:—

A. & A. Streeter, Godalming	£3,540	0
W. Lee & Son, High Wycombe	2,777	10
H. Roberts, West Bromwich	2,495	0
M C. E. Fitt, Reading	2,476	0
Johnson Bros., Hereford	2,450	0
G. R. Mann,* Edgware	2,141	8
R. W. Swaker, Whitton	2,050	0

* Accepted.

New Companies.

Granite Corporation, Ltd.

Registered to carry on the business of quarry-masters and brick-makers, merchants, brokers, agents and manufacturers of and dealers in and importers and exporters of granite, marble, whinstone and other stones, slate, or minerals in all forms, and in concrete, cement and all classes of manufactured stone, &c. Capital £400,000 in £1 shares.

City of London Fine Art Association, Ltd.

Registered to carry on the business of fine art publishers, photographers, fancy stationers, printers, artists' colourmen, dealers in photographic materials, &c. Capital £5,000 in £1 shares. A. A. Archer is the managing director. Registered office: 195A, High Street, Kensington, W.

Partridge, Cox & Co., Ltd.

Registered to acquire the business heretofore carried on by F. J. Cox at Bath, and to carry on the business of timber growers, merchants, brokers and factors, sawmill proprietors, sawmillers, timber surveyors, valuers and agents, dealers in all kinds of building materials, brick and tile makers, slaters, &c. Capital £12,000 in 6,000 six per cent. cumulative preference shares of £1 each, 5,950 shares of £1 each and five founders' shares of £10 each. The first directors are F. J. Cox, A. B. Partridge, O. A. Ellis, J. J. D. Ratcliffe and F. S. Partridge.

Bland Brothers, Ltd.

Registered to acquire the business of electrical sanitary and general engineers as now carried on by W. E. Bland and A. H. Bland as Bland Brothers, of 147, Barras Bridge, Newcastle-on-Tyne, and at Church Street, West Hartlepool, Durham, &c. Capital £20,000 in £1 shares. The first directors are W. E. and A. H. Bland and E. B. Downie; chairman, W. E. Bland. Registered office: 147, Barras Bridge, Newcastle-on-Tyne.

Petersen-Stephens Engineering Co, Ltd.

Registered to acquire the business of consulting and general engineers now carried on at Newcastle-on-Tyne as the Petersen-Stephens Engineering Company, and to carry on the business of hydraulic, electrical, mechanical and general engineers' founders, merchants, timber merchants, builders, brick and tile makers, &c. Capital £5,000 in £1 shares. The first directors are William Petersen (chairman) and W. J. Stephens.

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Registered to acquire any lands, buildings, hereditaments and other property of any tenure in the United Kingdom or any estate or interest therein, and to develop and turn to account the same, to lay-out lands for building purposes; as builders and contractors. Capital £20,000 in £1 shares. The first directors are H. O. Ellis, B. J. Greenwood and J. S. Holliday. Registered office: 46, Fenchurch Street, E.C.

L. & W. Trust, Ltd.

Registered to acquire any lands, buildings, &c., in London or elsewhere; to develop and turn to account the same; as builders and contractors, dealers in stone, sand lime, bricks, timber, hardware and other building materials; as house agents, &c. Capital £2,000 in £1 shares. Registered office: 28, Victoria Street, Westminster, S.W.

Carway, Limited.

Registered to acquire any collieries, ironworks, patent fuel works, iron and other mines, quarries, mining rights, &c.; and to carry on business as miners, smelters, engineers, colliery proprietors, coke manufacturers, iron masters and founders, to make merchantable coal stone, ironstone, iron brick, earth bricks; as shippers and shipowners, builders of rolling stock, &c. Capital £100,000 in £1 shares. The first directors are J. Stevens (chairman) and A. Jones (managing director). Registered office: Carway Colliery, Carway, Carmarthenshire.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	15	0
Sainfoin mixture ..	do.	4	10	0	5	5	0
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.		—		1	8	7
Colza Oil, English ..	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels ..	do	1	12	3		—	
Petroleum, American ..	per gal.	0	0	7⅛	0	0	7¼
Do. Russian ..	do.	0	0	6⅝	0	0	6
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	4	17	0	4	18	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	8	6		—	
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	7	0	1	7	1½

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	80	0	0		—	
Iron, Staffs., bar ..	do.	6	15	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	15	0		—	
Lead, pig, Soft Foreign ..	do.	11	10	0	11	13	3
Do. do. English common brands	do.	12	0	0		—	
Do. sheet, English 3lb per sq. ft. and upwards	do.	12	15	0		—	
Do. pipe	do.	13	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	6	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	15	0
Do. Mild bars	do.	6	15	0	7	0	0
Tin, Foreign	do.	114	0	0	114	10	0
Do. English ingots ..	do.	117	0	0	117	10	0
Zinc, sheets, Silesian ..	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	0	0	17	5	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fur, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec, Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	9	10	0	10	15	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	17	0	0		—	
Do. do. 2nd „	do.	15	10	0		—	
Do. do. unsorted	do.	10	5	0		—	
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	12	0	0	17	5	0
Do. White Sea ..	do.	8	5	0	13	15	0
Do. Quebec Pine, 1st ..	do.	27	5	0		—	
Do. do. 2nd ..	do.	22	5	0		—	
Do. do. 3rd &c.	do.	9	13	0		—	
Do. Canadian Spruce, 1st	do.	10	10	0	11	10	0
Do. do. 3rd & 2nd	do.	7	10	0	8	15	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	5	10	6	11	5	0
Flooring Boards 1in. prepared, 1st ..	per square	0	11	3		—	
Do. 2nd ..	do.	0	10	0	0	10	6
Do. 3rd &c. ..	do.	0	9	3		—	

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4 5/32		—	
Do. Honduras ..	do.	0	0	1¾		—	
Do. Tobasco	do.	0	0	3¾		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	4 11/32		—	
Do. African ..	do.	0	0	3½		—	
Do. St. Domingo	do.	0	0	6¾		—	
Do. Tobasco ..	do.	0	0	3 29/32		—	
Do. Cuba ..	do.	0	0	4 7/16		—	
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ..	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1		—	

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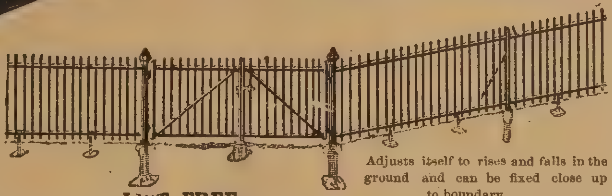

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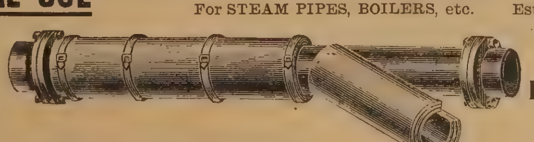

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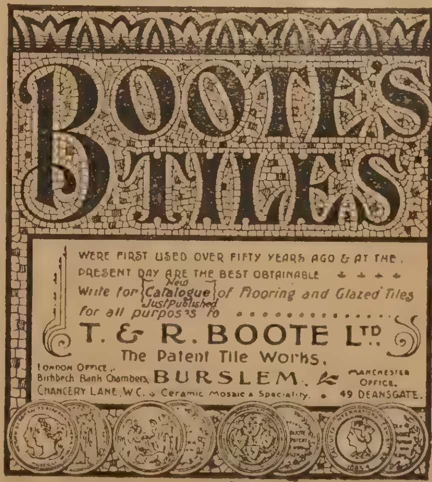

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COMING EVENTS.

Wednesday, November 6.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.). Inspection and Demonstration at Knacker Yard, at 3 p.m.—Mr. W. Hunting, F.R.C.V.S., on "Practical Methods of Stalling and Slaughtering Animals," at 7 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Mrs. Craigie on "Dante and Botticelli," 7.45 p.m

ROYAL ARCHÆOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.—Mr. C. A. Bradford on "A Vesica Piscis Window of Musical Character in Millom Church." Mr R. L. Hobson on "Mediæval Pottery found in England," 4 p.m.

PROVIDENT INSTITUTE OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Ordinary Meeting, 8 p.m.

Thursday, November 7.

MANCHESTER SOCIETY OF ARCHITECTS (Students' Meeting).—Mr C. G. Agate on "Hobbies."

CARPENTERS' COMPANY, Carpenters' Hall, E.C. (Lectures on Sanitary Building Construction).—Mr. James Bartlett on "Setting-out Work and Bylaws," 7.30 p.m.

Friday, November 8.

ARCHITECTURAL ASSOCIATION (Discussion Section). Mr. W. E. Davis on "The Finishing of a Dwelling House," 7.30 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. Robert Stuart, on "Soft Wood," and Mr. D. S. Pringle on "Hard Wood," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers.—Mr. James King M.R.C.V S., on "Diseased Meat," 7 p.m.

Monday, November 11.

SURVEYOR'S INSTITUTION.—Ordinary General Meeting at 8 p.m

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, B.A., M.D., on "Fresh Meat and Preserving and Storing Foods," 7 p.m.

Tuesday, November 12.

INSTITUTION OF CIVIL ENGINEERS.—Mr. W. Kaye Parry, M.A., and W. E. Adeney, D.Sc., on "The Discharge of Sewage into a Tidal Estuary," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Inspection and Demonstation at the Metropolitan Cattle Market, York Road. N., at 2 p.m., conducted by Mr James King, M.R.C.V.S.

Wednesday, November 13.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, B.A., M.D., on "The Hygiene of Byres, Lairs, &c.," 7 p.m.

Thursday, November 14.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. C. F. Brindley, on "Organ Cases and Organ Chambers."

MANCHASTER SOCIETY OF ARCHITECTS.—Paper by Mr. Paul Waterhouse, M.A.

Friday, November 15.

ARCHITECTURAL ASSOCIATION.—Mr Max Clarke on "The Sanitation of a Country House," 7.30 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, B.A., M.D., on "The Laws. By-laws, and Regulatious affecting the Infection and Sale of Meat, &c.," 7 p.m.

Mr. Abbey's Decorations for the Boston Library.—The Corporation of the City of London have lent one of the galleries at Guildhall for the exhibition of ten large pictures by Mr. E. A. Abbey, R.A., completing the series of decorations executed by him for the public library of Boston, U.S.A. The subject of the series is the venerable story of the Quest of the Holy Grail. They are on exhibition during the whole of this month.

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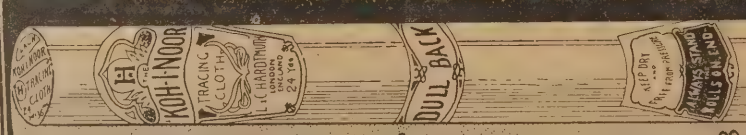
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Nov. 13, 1901.
No. 353.

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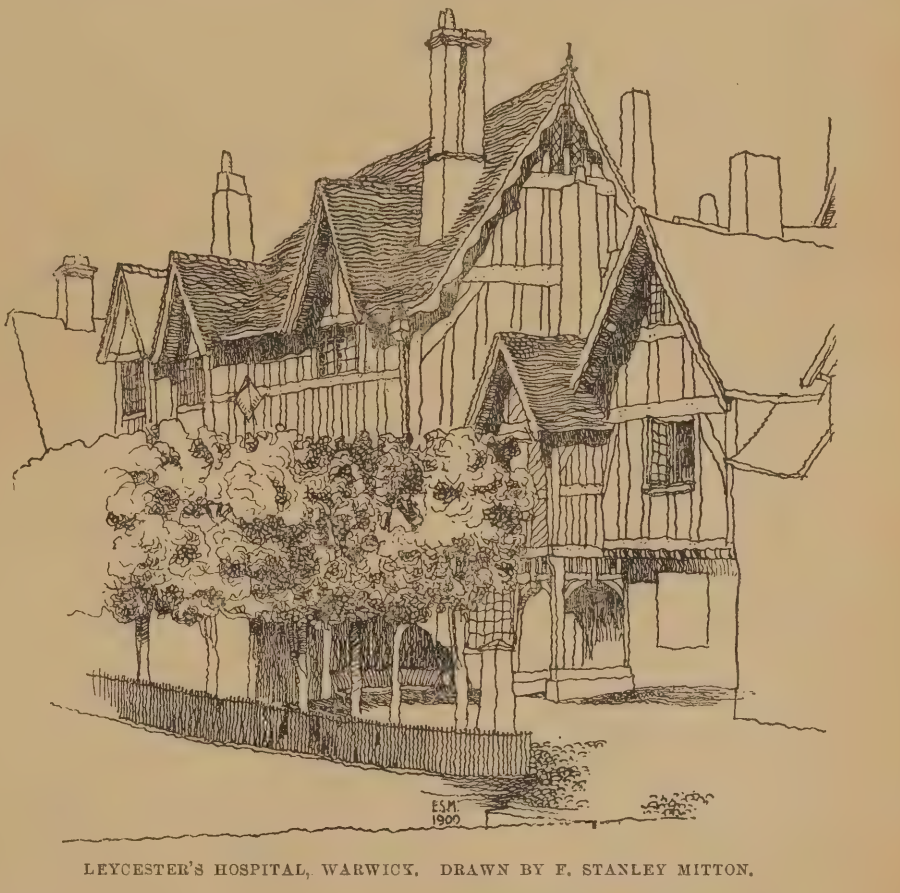
Spoiling the Thames. THE London County Council have preserved the magnificent view from Richmond Hill by deciding to pay half the cost of purchasing the Marble Hill Estate, which is sixty-six acres in extent. The actual contributions to be made are as follows:—Middlesex County Council, £12,000; Surrey County Council, £10,000; City Corporation, £5,000; Richmond Corporation, £5,000; Twickenham Council, £3,000; Hammersmith Council, £1,000; London County Council, £36,000. This purchase preserves from the builder's hands the bulk of the wooded land on the Middlesex side which can be seen from the Terrace at Richmond, and it is fairly certain that the opposite shore will be saved by Lord Dysart giving up his remaining manorial rights over Ham and Petersham Commons, Ham Fields, Petersham Fields, and granting a strip of land, at least 150ft. wide, extending for two miles from Twickenham Ferry to the One Tree, near Kingston. The view from Richmond Hill is saved, but the builder will soon be busy higher up the river. Beyond the Marble Hill Estate he is felling down the fine cedars and covering the ground with drain-pipes and road-making materials. Further up, again, on Eel Pie Island, the auctioneers' board foretells what will follow, and similar boards can be seen at and above Teddington. The speculative builder cannot be stopped. He will erect his houses, and these will spoil the beauty of the Thames. If anyone wants a proof of this, let him look at the Cambridge House Estate just above Richmond Bridge. There he will see enough to sicken him of the modern builder.

Leycester's Hospital, Warwick. THIS fine example of half-timber construction stands on the western side of High Street, Warwick. It originally belonged to the Guilds of the Holy Trinity and the Blessed Virgin and St. George the Martyr, and it appears to have been erected about the reign of Henry the Sixth. Dugdale tells us that the inmates of the hospital, who were to be twelve in number besides the master, were to be "impotent persons, not having above five pounds per annum of their own, and such as either had been or should be maimed in the wars in the said Q's. service, her heirs and successors, especially under the conduct of the said Earl or his heirs, or had been servants and tenants to him and his heirs, and born in the counties of Warwick or Gloucester, or having their dwelling there for five years before; and in case there happen to be none such hurt in the wars, then other poor of Kenilworth, Warwick, Stretford-on-Avon, in this county, or of Wotton-under-Edge, or Erlingham, in Gloucestershire, to be recommended by the minister and churchwardens where they last had their aboad; which poor men are to have liveries (viz., gowns of blue cloth, with a ragged staff embroidered on the left sleeve) and not to go into the town without them." The garden of the hospital is very tastefully laid out, and commands a fine view of the adjacent county. The chapel, which adjoins, is dedicated to St. James and reaches across the West Gate. It is neatly fitted up for the use of the master. The building gains considerably in the twilight, rising from the foundation of rock with the flying buttresses added in 1863, making all together a fine skyline against the setting sun.



LEYCESTER'S HOSPITAL, WARWICK. DRAWN BY F. STANLEY MITTON.

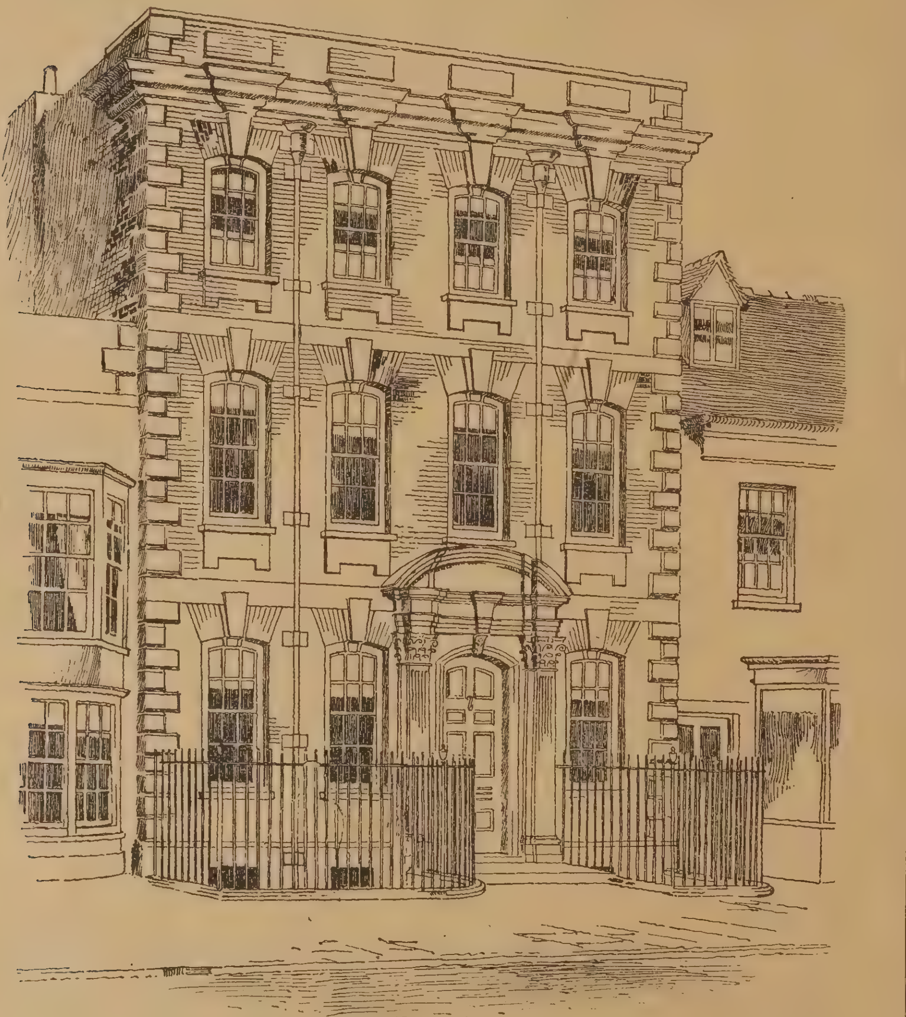
The Liverpool Faction. WE were glad to be able to announce a fortnight ago that the Liverpool Cathedral Executive Committee had (apparently) seen their mistake and decided not to restrict the competition to Gothic designs. They are now hard at work trying to raise subscriptions, and have actually appointed an organization secretary at a stipend of £200 a year, with second-class travelling and out-of-pocket expenses. In the meanwhile we may just look at the amended conditions published. Architects—both those who have been engaged in the erection of cathedrals and churches, and those who have not, but "whose tastes have led them to study and design buildings of an ecclesiastical character"—are invited to send in by June 30th next drawings and other illustrations of their work, or a cathedral design. The portfolios will be carefully examined by the Committee, with the assistance of professional advisers, and a few architects will be asked to submit designs for the proposed cathedral at three hundred guineas apiece. It is only fair to give the Committee the benefit of any doubt, but it is certain that they do not enjoy the full confidence of the architectural profession. The following letter, which we recently received from a correspondent, voices the thoughts of many people: "It does not appear to me that much has been gained by the concession of the Liverpool Cathedral Committee. As things stand, their action suggests the amiable conclusion that it pleases the profession and in no way affects the Committee. Surely no architect would send a design other than Gothic to so biased a body, unless guaranteed that the final decision shall rest with an impartial assessor." Of course it all depends on who the "professional advisers" are, though it is fairly certain that they will be Gothicists. The Committee should name their assessors first. However, it is futile to argue the question any more. "Convinced against their will, they are of the same opinion still;" and so there's an end of the matter.

Street-Lighting in Fog. ABOUT a year and a half ago we took occasion to point out that the lighting of streets by electric arc-lamps of great power, placed on high standards at considerable distances apart, was not scientific, as it simply meant a greater dead-point and more intense darkness between the lamps. During foggy weather like that recently experienced in London the defect is much more noticeable, and the observations made by Mr. L. F. Vernon Harcourt, M.I.C.E., whilst walking down Gower Street in a thick fog, are worthy of careful consideration. In this street electric arc lamps, duplex incandescent gas lights, and ordinary gas lights are fixed. The arc lamps near University College gave a brilliant light close to the high standards, but midway between the standards the lights were entirely obliterated by the fog, and the complete darkness appeared the more intense after the preceding illumination near the standards. Further on the double incandescent gas lights in the ordinary gas lamps, being much lower and nearer together than the arc lights, were never lost sight of. The ordinary old fashioned gas lights, reached at Bedford Square, gave a decidedly less effective illumination than the duplex incandescent gas lights, but were very much superior to the arc lights. Just beyond Bedford Square a low brilliant electric arc light at the entrance to some flats happens to be close to an ordinary gas light, and on proceeding towards Oxford Street the two lights, though presenting a great contrast close by, were almost simulaneously lost sight of through the fog. These observations prove that electric arc lights as being put up in London, owing to their height, their distance apart, and their relative deficiency in penetration through fogs, provide a most unsatisfactory method of lighting in the foggy weather to which the Metropolis is so subject during the winter months.

HIGHWORTH, WILTS.

BY PROF. G. R. BENNETT AND H. T. REES.

RURAL England abounds in historical associations. In the speech of the peasant are many obsolete words and phrases, common and correct in the language of our ancestors. From the stories told round the fireside of the village inn we gather much concerning the habits and customs, the games and pastimes, of olden days. Then there are innumerable buildings standing as eloquent witnesses of the development of our national and social life. Throughout the country are scattered small old-fashioned market towns, reminiscent of the days when prosperity dwelt in agricultural districts; and here one often finds some structure suggestive of old romance or mediæval mystery.



MANSION IN THE HIGH STREET, HIGHWORTH, WILTS, ATTRIBUTED TO INIGO JONES.

Very typical of such places is Highworth, in the north of Wiltshire. It was formerly known as Vorda, but, probably owing to its position on an eminence overlooking the valley of the Isis, it became High-Vord and then Highworth.

There it lies on the hill top, the old houses clustering around its church, whose square-built tower is a landmark for many miles around. The principal street is wide, and its quaint old buildings with gabled dormer windows and stone roofs make it very picturesque, the effect being heightened by the old cobble pavements which until recently edged the road.

Visitors generally make their way to the old church first. It is dedicated to St. Michael, and is a fairly good specimen of fifteenth-century work, consisting of a nave and two aisles. It is said that at the time of the Civil War between the Royalists and the Roundheads the town, being loyal to the cause of the king, was besieged by Cromwell's Ironsides. At this stirring time the church became the last stronghold of the defenders, and a hole in the stonework over the door at the west end is pointed out as evidence of the bombardment which the garrison had to endure. Whether this is true or not it would be rash to say, but an old workman who was engaged in the restoration of the church some years ago asserts that he saw sufficient leaden bullets taken from crevices in the walls to fill his hat, and it was a capacious one as hats go nowadays.

In the town's heyday, when large markets were frequently held in the old market square and the annual Lammas Fair and Michaelmas Mop, or Hiring Fair, were well patronised by the well-to-do farmers and their servants, inns were in great requisition, so that nearly every other house carried a sign bearing some fantastic design such as the "Cross Keys" or the "Saracen's Head." Many of these inns have recently closed their hospitable doors, but some still remain, with their signs suspended on good wrought-iron brackets.

The "King and Queen," in the main street, is specially worthy of notice, with its signboard projecting far over the road. It has on the first floor a large bay carried on wooden posts over the entrance. Another is the "Red Lion," which, facing a sunny square paved with cobbles, looks very quaint and charming with its bracketed cornice and leaded lights. Old inhabitants can remember when the stocks stood in the open space in front of this inn, and here the ring was fixed to which the bull was tied when bull-baiting was a favourite sport.

On the opposite side of the market-place is a Tudor house bearing the date 1632. It has some good detail, but has followed the fortunes of the town, and is now divided into two smaller dwellings. As originally built, the house had a four-centred Perpendicular doorway, which has been filled up with rubble walling, leaving a space for an ordinary ledged door, a similar one being inserted in the blank wall-space between the two bays. The leaded lights have been removed from both floors of one bay and replaced with modern wooden casements, the transoms having been removed from the lower-storey window to accommodate these. Altogether, the effect has been much spoiled.

In the High Street is a fine red-brick mansion attributed to Inigo Jones. It is probable that he did design it, as he also designed Coleshill House, which is situated about two miles outside the town. The mansion has a good stone doorway with fluted Corinthian pilasters, but it is regrettable that its pediment is so broken up, a fault also apparent in the main cornice of the building; this tends to over-emphasize the keystones of the upper windows. Further down the street is a house of humbler dimensions, now converted into the local post-office, with a plain stucco front, but it has a finely-carved doorhead, which is shown among the accompanying illustrations.

Views & Reviews.

Early English Renaissance.

This book by Mr. J. Alfred Gotch is an admirable contribution to the history of the English Renaissance. It does not clash with either the author's other book, which was a series of examples, or with Mr. Blomfield's "History of Renaissance Architecture in England," as it deals with the development of the style from the close of the Gothic period down to the advent of Inigo Jones. The book is admirably illustrated and most lucidly written, and it should be of great value to students of this period, or to those preparing for the architectural societies' examinations. The book is especially interesting also in tracing the gradual extinction of the Gothic tradition from this early beginning in the stimulation of a taste for Classic architecture by the Renaissance in literature and the training of our young nobles in Italy. Considerable space is devoted to John Thorpe's remarkable collection of drawings. Little space is, however, devoted to gardens, a most fascinating study. We can heartily agree with the following remarks: "It is the work of the men who were baffled that we are now to examine: work which, judged from the standpoint of their better-tutored successors, may almost be regarded as a failure, but work which exhibits a vitality, a fancy and a sense of romance for which we look in vain in the more correct architecture of the eighteenth century." It will always be the common-sense and naïvete which will give interest in architecture, and the delight of the workers will be shared by the beholders far more than any staid academic classicism will be.

"Early Renaissance Architecture in England." By J. Alfred Gotch, F.S.A. London: B. T. Batsford, 94, High Holborn, W.C. Price 21s.

Valuations and Compensations.

This book, by the late Prof. Banister Fletcher, like its companion volumes of the series by the same author, forms an admirable and most useful text-book. The need for a second edition has given the opportunity for the present editors to make considerable revision. The importance of making each valuation on its own merits is wisely insisted upon: "It is essential to study each property very minutely on the spot, and to consider all its qualifications having regard to all possibilities that may arise in the future. Valuation tables will not make a valuer, and should only be used after the survey is completed on the site." A complete example of how a valuation for a compensation claim may be arrived at is given at the end of the book, and will help the student more than many chapters of particularization.

"Valuations and Compensations." By the late Prof. Banister Fletcher. Second Edition. Revised and rewritten by Banister F. Fletcher and H. Phillips Fletcher. London: B. T. Batsford, 94, High Holborn, W.C. Price 6s. 6d.

SIR MARTIN CONWAY ON ART.

At the Museum of Classical Archæology, Cambridge, last week, Sir Martin Conway delivered his inaugural lecture as Slade Professor of Fine Art. Referring to his recent travels, he said it was exactly ten years since the study of art-history ceased to be the main preoccupation of his life and was exchanged for the engrossing cares and excitements of a more active career. He could not, therefore, stand before them clothed in the panoply of complete knowledge of the latest discoveries in art-history or the finest *nuances* of recent art-criticism ; but art was wide as life itself, and whoso had once given himself to her never escaped her sweet enthralment.

Latent Faculties.

After giving a definition of art, and pointing out that the pleasure which art exists to produce is not the maker's, but that of another, the Professor urged that the two human faculties which a work of art implied, the creative and the receptive, were both capable of development. By no known process could they with certainty originate either faculty in a man wholly lacking in it, if such person there be. But where the faculty existed it could be developed. The conviction that this is so was shown by the multitude of art schools wherewith civilised countries were now provided. The primary purpose of such schools was to equip artists with the requisite technical skill to enable them to express such emotions of beauty as might arise in them.

The secondary purpose, often far too much neglected, was by bringing the student in contact with noble works of art of various kinds and under the influence of as stimulating a teacher as possible, to feed and develop his sense of beauty, and thus provide material for his skill to express. It was a remarkable fact that the other faculty, equally essential to the life of art in a country, the perceptive faculty, received hardly any attention at the hands of educationists.

Public Taste.

Governments and municipalities would spend money enough on making artists, who when made would be unable to live unless each of them could find a considerable body of amateurs to buy his work. Yet the same Governments and municipalities which subsidised art schools were by no means correspondingly intent on developing the perceptive faculty in the purchasing public. They would hold an occasional exhibition, and even perhaps form a permanent gallery of paintings as though pictures were the only art, whilst in the incompetent planning of new streets and erection of public monuments and buildings, in the obliteration of open spaces, the destruction of scenes of natural beauty, and such other perverse object-lessons, they more than counteracted the educational effect of their vaunted exhibitions.

The Effects of Taxing Site Values.

Take a contemporary instance. A body of public opinion was now forming in favour of what is called the taxation of site values. This might be a proper or an improper means of raising revenue. He had nothing to say for or against it on that platform. What he did observe, however, was that neither its proposers nor its opponents seemed to have made the smallest attempt to consider what effect such taxation, in the form in which it was shadowed forth, was bound to have upon the beauty of our towns. Such a tax would fall with ruinous effect upon the owners of open spaces and plots of garden-ground not yet invaded by the flat-builder.

Now one of the greatest glories of London was its little private gardens, remnants of the country engulfed in the great city. These little gardens were not merely a joy to their owners but also to all the neighbours whose windows commanded a glimpse of them ; and they formed valuable lungs even for houses that were out of sight. So far from garden-owners being penalised in a great city, they ought rather to be endowed. Whatever legislation tended to cover every inch of ground in a city with buildings was pernicious. The pressure of population and the natural desire of a landowner to make the most profitable use of his property already exercised an almost irresistible impulse to abolish private city-gardens. In England this was to some extent counterbalanced by the Englishman's inherited love of Nature and of life in contact with Nature. That most healthful sentiment should be encouraged in every way for the common good. Every scrap of land kept as a garden in a city should be rated and taxed on the lowest scale.

TUDOR HOUSE FACING THE MARKET SQUARE, HIGHWORTH.

Committees and National Monuments.

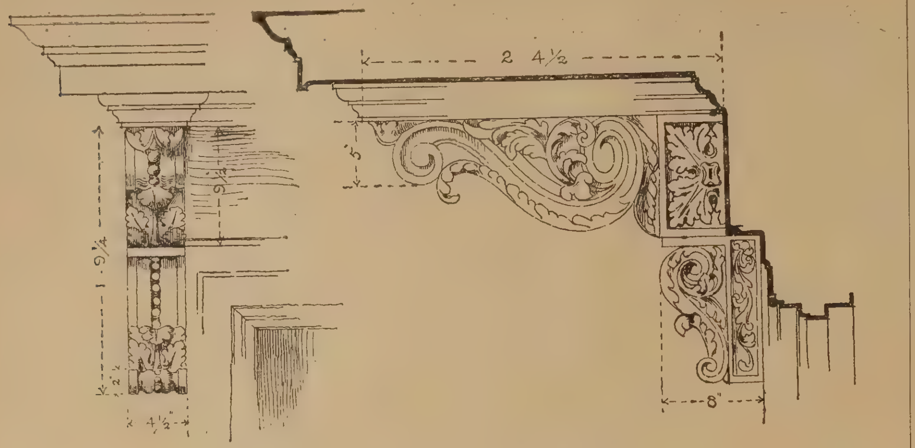
Another social habit of ours which blighted nascent popular taste was that of confiding to committees of more or less eminent gentlemen the ordering of local or national monuments. Artists who had had experience of them were unanimous in declaring that it was almost impossible to produce good work under the supervision of a committee. Utterly detestable, too, were so-called competitions when a selected or an unlimited number of artists were invited to submit designs. England was not a country of hopeless Philistines. Possibly it did not contain a larger percentage of Philistines than Athens did in the day of Pericles. It was the structure of our society that was Philistine, not the units of which society was composed. From the point of view of art our Governmental methods were faulty, but they were not incapable of reform. Look across the ocean to our kindred ; they would find a similar society to our own in which art had taken firm root. Their monuments, their public buildings, their sky-scraping office blocks, were far superior to corresponding modern products here.

The spirit which had been infused in quite recent years into the people of the United States might likewise be infused into our own folk. It was not the desire that we lacked, but the understanding how collectively to go to work to attain the end which all desired.

Individualism.

A work of art for the enjoyment of all was essentially the conception of one. Your artist, if he was to do his best, must be the autocrat of his own work, having over it the same responsible independent command as a commander-in-chief has over his army in the field. The curse of the ill-equipped amateur blighted our national life to-day. The fact had been recently and emphatically pointed out. The great need of the present day, from the point of view of the production of fine art, was the education of the amateur, the purchaser. How was this to be accomplished, or even attempted? That was the problem that faced each occupant of the Slade Chairs at Oxford and Cambridge for to answer that question was the end for which they were founded. They had to endeavour to awaken in the youth of the University a sense of the charm and beauty of fine art. It was his duty to tell them that art was a necessary part of healthy human life—that there was nothing effeminate about it, nothing unhealthy, nothing ignoble.

"THE KING AND QUEEN" INN, HIGHWORTH.



DOOR-HEAD TO POST-OFFICE, HIGHWORTH.

ANGLO-INDIAN ARCHITECTURE.

Its Characteristics and Defects.

THOUGH we have had a permanent footing in India for more than two centuries, we do not seem to have even begun to evolve an order of architecture adapted to the conditions of life there. In every country practical experience has led the inhabitants to adopt some distinctive style in the construction of their habitations, suited to the climate on the one hand and to their means and resources on the other. The Eskimo has his snow house, while the native of Borneo raises his airy hut on piles high above the swampy ground. The architecture of China and Japan is very different from that of Europe, and even in Europe itself the houses in the warm south are planned in some respects differently from those in the cold north.

The Bungalow.

When Europeans first settled in India they naturally modelled their dwellings after those of the inhabitants, and the "bungalow" came into general use. The derivation of this word is given us by Buchanan, writing in the year 1810. "The style of private edifices," he says, "that is proper and peculiar to Bengal consists of a hut with a pent roof, constructed of two sloping sides, which meet in a ridge. This kind of hut, it is said, from being peculiar to Bengal, is called by the natives 'Banggolo.' The edifice itself is more fully described by Hodges, who wrote thirty years earlier: "Bungalows are buildings in India, generally raised on a base of brick, one, two, or 3ft. from the ground, and consist of only one storey; the plan of them usually is a large room in the centre for an eating and sitting room, and rooms at each corner for sleeping; the whole is covered with one general thatch, which comes low to each side; the spaces between the angle rooms are viranders, or open porticoes." And, in sooth, they were comfortable. Their worst defect, perhaps, as the "Times of India" recently remarked, was the darkness of the centre rooms in rainy weather. With skylights let into the roof to remedy this, a well-built bungalow would be almost an ideal dwelling for a country like India. It does not readily get heated by the sun, the ample verandahs tone down the fierce glare, and the open doors and windows on all sides give free passage to the breeze.

The Change Effected by Towns.

Unfortunately this style of building is practicable only where land is of little value. As stations grow into towns it becomes imperative to economise space by building upper storeys. To meet this difficulty the people of India invented, or adopted, a plan which was in vogue in South Europe before the Christian era. The centre of the edifice was converted into an open courtyard, around which the rooms were arranged, with a running verandah all round on the inside. But it does not appear to have found favour in India. Perhaps by the time they began to require two-storeyed buildings they also had begun to despise things native; or, more probably, the architecture at that stage began to pass out of private guidance into that of a department, the heads of which had brought their ideas from Europe and were not compelled to live in the habitations which they contrived. However that may be, the bungalow began to be replaced by a style of edifice which, be it barrack, college, court or dwelling-house, is in its essential features the same. The external aspect may be Gothic, Saracenic, mediæval or *fin-de-siècle*; the floors may be cement, asphalt, mosaic, or almond cake of broken crockery; these are accidentals which do not effect the character of the building from the point of view of those who occupy it.

Hot Walls and Hot Rooms.

To them it is a massive stone pile, the walls of which, rising sheer from the ground to the roof like a rocky precipice, receive the fierce heat of the sun from dawn till noon on one side, and from noon till dusk on the other. They are usually fronted with broad verandahs, architecturally imposing from without; from within they are uninhabitable all the after part of the day, and help to heat the inner rooms by the radiation from their burning stone floors. This is sometimes remedied afterwards by fitting them with sunshades of striped canvas.

The imposing stone barracks which began thirty or forty years ago to take the place of the old thatched lines in which our European troops used to live probably cost at least ten times as much; but we believe that Tommy Atkins himself, if the choice had been offered him, would have elected to remain under his old thatch. The same thing is now happening in Marine Lines in Bombay. Some of the old bungalows were scarcely defensible. They were built on the level of the ground, or below it, and were dark and damp. But it is a question whether many of them were not more comfortable to live in than the massive piles which are slowly rising in their places at great cost. It is scarcely fair to blame the department which is erecting these, or the individual officers who compose it. A large department, like a loaded wagon, makes grooves as it goes, and allows no scope for the eccentricities of genius. A Government engineer who tried anything daringly novel would have to be relegated to the Sind Canals in the interests of good administration. The only hope lies in individual and irresponsible genius.

Ventilating Buildings in India.

Whilst dealing with this subject it is opportune to refer to an article on the "Ventilation of Buildings in India" which appeared in a recent issue of "Cassier's Magazine." The writer, Mr. John Wallace, C.E., remarks that house property in Bombay is an exceedingly popular investment among the wealthy natives; and as everyone of them seems to think that the possession of money brings with it a talent for designing dwellings, the buildings are mostly unsatisfactory both as regards the division of space and as regards ventilation, the latter being especially defective. Large and lofty rooms are now too expensive for any but the wealthiest people, on account of the high price of land; and blocks of buildings, which are now in fashion, have so much mass that they are properly ventilated only when a breeze is blowing. This amounts to saying that the air in them is often quite stagnant on account of the frequent periods of calm on an island whose mean annual wind velocity scarcely exceeds twelve miles an hour.

Most of the new houses have a fine show of windows on the outside, but no corresponding opening to allow a current of air to pass through. The mean annual temperature is 79·13° Fahr., and the mean relative humidity 77 per cent.

The Punkah.

As it is not possible to dry the air in an ordinary house, the usual remedy is to produce a current by means of a punkah; and although the influence of this is very local, it has been found that in the worst Bombay weather life is made tolerable in its current. The chief drawback of the punkah is the punkahwalla. Every year in the dry season camps are established in parks and open spaces about Bombay to accommodate an excess of population which finds life under canvas, with its many drawbacks, preferable to life in houses which are badly arranged and often unwholesome. Various projects have been discussed with a view to providing suitable houses for the European population, but nothing so far has come of them, and the need for wholesome houses is, if possible, greater than ever.

There is an excellent climate which is very near Bombay, measuring vertically. It lies within 100ft. of the surface, and is free from all the dust and smells that are too much in evidence at the ground level, and even at times in the third storey. Mr. Wallace suggests that this pure air should be drawn down into the houses by means of a fan on the roof.

EXPLORATION IN EGYPT.

THE GREAT DISCOVERIES.

THE fifteenth ordinary general meeting of the Egypt Exploration Fund was held on Thursday last at Burlington House. Sir John Evans, K.C.B., who presided, stated that the financial position of all three branches of the fund was most satisfactory. He went on to refer to the archæological survey for the year, mentioning that it had resulted in the production of two interesting volumes. There had been no expedition on the part of the survey either in 1900 or 1901; but in the ensuing season one would be undertaken, though its immediate destination had not been absolutely settled. During the past season the scene of the fund's operations had been, in the main, on the site of the Royal Tombs near Abydos.

Professor Petrie afterwards gave an address, in the course of which he said:—This year we have the satisfaction of completing the most important historical work that has yet come into our hands. The continuous order of seventeen kings has been established; and the very foundations of Egyptian history have been settled in a manner which had hitherto seemed entirely beyond hope. The royal cemetery of the tombs of the kings at Thebes, belonging to the eighteenth to nineteenth dynasties, and that of the Pyramid-Builders at Memphis, of the fourth to sixth dynasties, were the only series of royal tombs yet known; and neither of those had added anything to the history which was already fixed by other monuments.

But the recovery of the royal tombs of the earliest dynasties has given us not only another royal cemetery, but has provided the only contemporary history of their time, and completely vindicated the historical character of the lists which had been preserved by later ages. The criticism of myths had told us that Mena, the founder of the Egyptian monarchy, was but a form of Mena, the lawgiver of India, and of Minos, the hero of Crete; and to hope for tangible monuments of his time was but seeing castles in cloudland. Now the long line of a dozen kings back to Mena is clear before us; and even the kings which went before him are better known to us by actual objects than are half the Saxon kings of England. No such complete materialization of history has been obtained at one stroke from any other country or age. And such a result was least to be expected from ground which had been pronounced exhausted, the last clearance of which, unhappily, had just been made before our work there.

Altogether in the two volumes issued to you there are over 500 photographs, over 2,000 drawings and nearly 2,000 marks, beside the full and detailed plans and sections of the whole of the tombs. None of this mass of material, which alone has enabled us to restore the earliest dynasties, would ever have been known had we been content to leave the subject where the common routine of excavation had already abandoned it. You see before you on the largest scale an object-lesson on the futility and destructiveness of a mode of work which was no worse than the greater part of what has been perpetrated in Egypt in the name of excavations during the last hundred years.

Now there awaits us yet the great temple site of Abydos, the ground of the earliest temple, that of Osiris. It has been largely dug over for earth, and some monuments have been removed, but the lower levels of it are yet untouched.

HIGHWORTH PARISH CHURCH. DRAWN BY H. T. REES.

The site is a very large one, about 500ft. by 1,000ft., or three times the size of the whole of Trafalgar Square and its roads, and it will have to be turned over 12ft. deep. If we get a third of that, or as much as Trafalgar Square, turned over in the course of a season, that will be as much as one can expect, so that about three years will be occupied in exploring this great site. It is in that ground that we may hope to find tombs of the earliest historic time, and carvings in stone and ivory of the primitive kings, like those from Hierakonpolis.

No such opening of new fields to the mind has come to pass since the days when the Renaissance scholars burst into the world of lost classic authors; even the surprising unfolding of Assyria and Babylonia lacks the historic completion of the Egyptian record, and is still almost untouched in its archæology and development. Many a dim passage in the long course of the history yet awaits the light, and it will be the duty of the new century to fill in as far possible the details of the picture which has been sketched in the last few years.

CIVIL ENGINEERING.

MR. CHARLES HAWKSLEY delivered his presidential address last week to the Institution of Civil Engineers, of which his father, the late Mr. Thomas Hawksley, was president in 1872 and 1873.

He proceeded to give a rapid retrospect of the advances made during the nineteenth century in the more prominent branches of civil engineering.

As regards roads, he pointed out that, except for about 200 miles of good roads constructed by the blind road-maker, John Metcalf, in Lancashire and Yorkshire during the latter half of the eighteenth century, the roads in this country were in a deplorable condition at the beginning of last century, so that carriages often stuck fast in the ruts and travelling at a speed over six or seven miles an hour was almost impossible even on the main thoroughfares.

After touching on docks, lighthouses, naval architecture, mining, water-power and irrigation, Mr. Hawksley came to the history of water supply. Speaking of the regulation of fittings so as to be suitable for a constant supply, he said that formerly Parliament left the making of such regulations to the company or local authority entrusted with the supply of water, but of late years had unfortunately made them subject to the approval of a Government department which was possessed of no special knowledge in regard to distribution of water, and which, regardless of the experience of fifty years, persisted in so modifying the regulations submitted for their approval as to render them impracticable for the maintenance of a constant service. In regard to the quantity of water required for domestic purposes with a constant service, he remarked that, from statistics he recently collected, the quantity of water supplied for domestic and other non-metered purposes was, on the average of six towns supplied by companies and having a total population of 1,185,000 persons, 19 gals. per head per diem; while for ten towns supplied by public authorities, and having a total population of 3,961,000 persons, the average was 18¼ gals. He was unable to agree with those who held that all waterworks undertakings should be in the hands of public authorities. His experience taught him that where the local authority possessed the waterworks the streets committee complained that they had no sooner repaved a street than the water committee broke it open to lay a pipe; and the salaries in the finance department were raised because of the additional duties the officials had to perform. Should a company lag behind in its duty, there was the local authority at hand to urge it forward; but if the local authority was supine in the exercise of its duties there was no one to bring pressure, for the ratepayer was practically helpless.

Mr. Hawksley went on to speak of sewerage and sewage disposal, gasworks and electricity, mentioning in regard to the last that, although it was the youngest of the sciences, over £130,000,000 of capital had already been invested in this country alone in electrical undertakings.

The Early Engineers.

Summing up his impressions, Mr. Hawksley said that the more he learnt of those early engineers who practised in the latter half of the eighteenth and the first quarter of the nineteenth centuries, the greater became his astonishment at and admiration for the boldness of their designs and the success that attended their execution. Most of them were men of scanty education as the term was understood now, and had few, if any, precedents to guide them; yet in face of all difficulties, with no trained assistants to aid them, at a time when travelling was arduous, Brindley, Smeaton, Mylne, Rennie, Telford, and others, carried out works of which we might be proud at the present day, even with all our training and precedents, assistance and mechanical appliances. It might be well to recall that Brindley's early years were spent as an agricultural labourer,

NEW POLICE AND FIRE-BRIGADE STATION, CAMBRIDGE: THE WATCH COMMITTEE'S ROOM. JOHN MORLEY, ARCHITECT.

that Smeaton was a philosophical-instrument maker, Mylne an architect, Rennie a millwright and Telford a stone-mason.

Standard Sections of Iron and Steel.

In the latter part of his address Mr. Hawksley discussed the question of standardization. Most British civil engineers, he said, had probably suffered inconvenience, and their clients not unlikely loss, owing to the absence in Great Britain of standard sections of iron and steel. For example, the engineer, when designing a roof or bridge, having selected from the book of some well-known firm the sections of angle and T-iron best suited to his requirements, found the contractor asking to be allowed to substitute some other section, because the one chosen was out of stock, or was no longer rolled, or was required in such small quantity that the makers would not put in the rolls to produce it.

These difficulties had led to the adoption in Germany and America of standard sections, with great advantage to all concerned. The producer could cheapen the cost of production, being able to roll considerable quantities of any given section at one time and place in stock any surplus. The middleman (if any) could buy in the cheapest market and be certain of finding an outlet for his purchases. The buyer could be sure of obtaining the section he required with the least amount of delay and at the least cost.

For some time past the Council of the Institution had realised the disadvantages under which British manufacturers were placed by the lack of some acknowledged standards, and it therefore approached the Institutions of Mechanical Engineers and of Naval Architects, and the Iron and Steel Institute, with the result that the four societies formed a strong and influential committee to take up the subject. This committee sat for three days in June last, hearing evidence from all parts of the country and from those representing our colonies and dependencies, and this evidence was so unanimous as to the desirability of issuing standard sections and specifications that the Institution of Civil Engineers decided to adopt the committee's recommendation and proceed with the work forthwith.

The Four Committees.

The committee had been divided into four parts, to deal with (1) bridges and general construction (chairman, Sir Benjamin Baker), (2) railway rolling stock under-frames (chairman, Sir Douglas Fox), (3) rails (chairman, Sir J. Wolfe-Barry), and (4) ships (chairman, Mr. Archibald Denny).

These four committees were now engaged in standardizing the various sections used in their particular branches of industry. From the evidence laid before the committee it appeared that in America, where the American Society of Civil Engineers had issued standard sections for rails and standard specifications, the rolling-mill makers would in most cases only roll to those sections. Some instructive instances of the waste of time and money in this country for want of standard sections were laid before the committee. One instance must suffice—that of a section incorporated in a bridge for one of our colonies. Here the average cost of the material was £8 10s. a ton, but one of the sections specified was of such an odd size and the quantity of it was so small that it had to be made by a blacksmith at a cost of from £28 to £30 a ton. A striking case of the money wasted by unnecessary multiplication of the number of sections occurred recently, where the contractor endeavoured to obtain the sections specified for a certain bridge, but found that although they were contained in the price-list issued by the makers none were in stock, and delivery could not be given. The contractor, therefore, worked out a girder of equivalent strength, incorporating therein sections that could be readily obtained, and the saving on this one item was over £600. Germany had now sixty-seven various standardized sections, and America only forty-nine, while Britain had no standard section and used over 170 different ones. In electrical traction the need for standards of rails was being especially felt. It was recently shown that there were no fewer than seventy-one different sections of tram rails, many of the municipal engineers designing their own sections, which only differed slightly from those of their neighbours—just sufficiently to cause trouble and expense if one system ever became connected to the next. The American practice was to reduce the numbers of sections as much as possible, but this, Mr. Hawksley thought, was travelling too far in the opposite direction. Care must be taken to provide a considerable variety of sections in the first instance and to add to them from time to time as necessary. The chief disadvantage urged against standardization had been the tendency to cramp originality of design; and that this was not a groundless fear was shown by the refusal of American makers to roll anything outside their stock patterns.

After a vote of thanks had been proposed by Mr. Mansergh, and seconded by Sir Alexander Binnie, Mr. Hawksley presented the various medals and premiums awarded for papers read last year, and afterwards held a reception in the library.

CAMBRIDGE POLICE & FIRE STATION.

THE new police and fire-brigade station which has been erected in St. Andrew's Street, Cambridge, from the designs of Mr. John Morley, architect, of Cambridge, has a frontage of about 93ft., constructed of Weldon stone, with a depth of 150ft. The main entrance to the police station occupies a central position, and gives access to a lobby having an enquiry office 20ft. by 12ft. at one side, while close at hand is the charge room (20ft. by 18ft.) communicating with the cell corridor, thus allowing a prisoner to be taken to a cell immediately the charge has been recorded. Ten cells are provided, each 13ft. by 7ft.; they are warmed by hot-water apparatus, and in each there is an air flue connected with the main-trunk flue. The usual staff accommodation is provided, and between the chief constable's house, fronting Downing Place, and the new buildings is the drill yard, open at each end and covered by a glazed roof. Opposite the cells is a block having a parade-room on the ground floor, with lecture, recreation and mess rooms above. Of the various rooms in the building the Watch Committee's, illustrated on this page, is the best. It is oak panelled to a height of about 8ft., and the chimney-piece has a circular mirror in the centre. The room is 18ft. high and has an oak floor. The fire-brigade station measures 30ft. by 24ft., and provides accommodation for any equipment the town may require for its brigade. Messrs. Kerridge & Shaw were the contractors; their tender was a little over £15,000. We are enabled to use the accompanying illustrations through the courtesy of "The Cambridge Graphic."

New Patents.

These patents are open to opposition until December 16th.

1900.—**Knives for Brickmaking Machines.**—22,074. E. M. Tymm, 486, Stockport Road, Longsight, Manchester; and T. R. Slack, Cross Lane, Marple, Cheshire. In order to save expense and to facilitate renewal, the knife is made in two parts—a boss to fit on the shaft, and a blade dovetailed on to it.

Windows.—22,119. A. E. Wright, The Aviary, Ash Vale, Surrey. Sash lines and weights are replaced by a spiral spring at each side of the window. Normally, these keep the sashes closed. Devices are provided for holding them in an open position, and the parting beads are made removable to enable the sashes to be swung inwards.

1901.—**Parallel Rulers.**—2,870. R. W. W. Thom, 139, Dalkeith Road, Edinburgh. In the middle of the rulers a circular piece of glass or mica is mounted. This is centred, and angles or degrees are laid down from it on the rulers, the object being to enable the direction of lines and the size of angles to be determined with greater ease and accuracy.

The following specifications were published on Saturday last, and are open to opposition until December 23rd. The names in italics are those of communicators of inventions. A summary of the more important of them will be given next week.

1900.—16,301, Orr & McCulloch, down-draught ventilating cowl. 16,879, Griffin, wood-mitering and shaping machines. 18 355, Méaille, fireplace. 18,539, Dieterle, smoke-consuming firegrate. 19,097, Wait, fanlight openers. 20,272, Tenow & Flodström, lumber-elevating apparatus. 20,385, Huggins, self-closing seats, doors, &c. 21,139, Lowe & Line, joints for lead pipes. 21,591, Chavasse, domestic firegrates. 23,179, Pattison, T-squares.

1901.—932, Arnodin, counterbalanced and jointed suspension bridges. 1,331, Masbro' Foundry Co., Ltd., Harbershon & Boardman, domestic fireplaces. 5,910, Blanford, sash-fastenings. 7,734, Wheatley (*Roy*), cement foundations and landmarks. 10,143, FIREPROOF PLATE WALL CO, LTD., & SIDEBOTHAM, walls, ceilings, partitions, &c. 10,215, GOLDING & JAMES, casings for electric conductors on buildings. 15,402, FEYERABENDT, preserving and fireproofing wood. 15,732, SMITH & TRAVERS, radiators for buildings. 16,352, BIRKBECK (*J. H. Williams & Co.*), chain pipe-wrenches. 17,829, STONE & SIMKISS, skylights for corrugated iron roofing. 18,416, GRAY, covers of manholes or inspection chambers. 18,640, WILSON & WILSON, door-locks.

Correspondence.

Concrete Tanks.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, W.

SIR,—The following method of constructing a concrete tank may perhaps be of interest to some of your readers :—A round hole is dug, say 6ft. in diameter and 10ft. deep, and the bare earth is rendered with cement, the only bricks used being in the crown. These tanks can be constructed cheaply, they rarely fail, and they are durable. Some I know have been in use for sixty years.—Yours truly, JAMES PARTRIDGE.

Liverpool Cathedral: Newman's Gothic.

To the Editor of THE BUILDERS' JOURNAL.

MANCHESTER.

SIR,—The letter on p. 197 of your issue for October 30th, connecting the great names of Newman and Pugin with this subject, is of much interest. Cardinal Newman has elsewhere paid his high tribute to the Gothic style, and it should be noticed that in the letter now quoted he employs the term "detail" not in an architect's sense, but as referring to the arrangement and equipment of a building. As regards the broad question of style, a mind so acutely poised as his could scarcely have claimed the Chiesa Nuova, the Gesu, &c., at Rome as Christian architecture in any strict sense. The mere fact that they were erected for ecclesiastical uses does not confer upon them such a title any more than it does on the "tin tabernacle" of the present progressive day. And it is a curious practical commentary on his quoted letter that in his own church at Edgbaston (threatened, I fear, by the proposed memorial church) the sixteenth-century "Oratorian" style was not adopted, but an earlier development even than Gothic—a sort of Basilican Romanesque one might call it.—Yours truly, W. RANDOLPH.

Builders' Notes.

Mr. P. Purvey, builder, of Hayward's Heath, died recently at the age of sixty-five years.

Mr. William Carroll, builder and contractor, of Kingstown, Ireland, died recently at the age of fifty-six years.

Mr. W. Outlaw, of Diss, died recently at the age of seventy years. Deceased was for many years the estate builder and carpenter on the Brome and Oakley Estates, under the late Sir E. C. Kerrison.

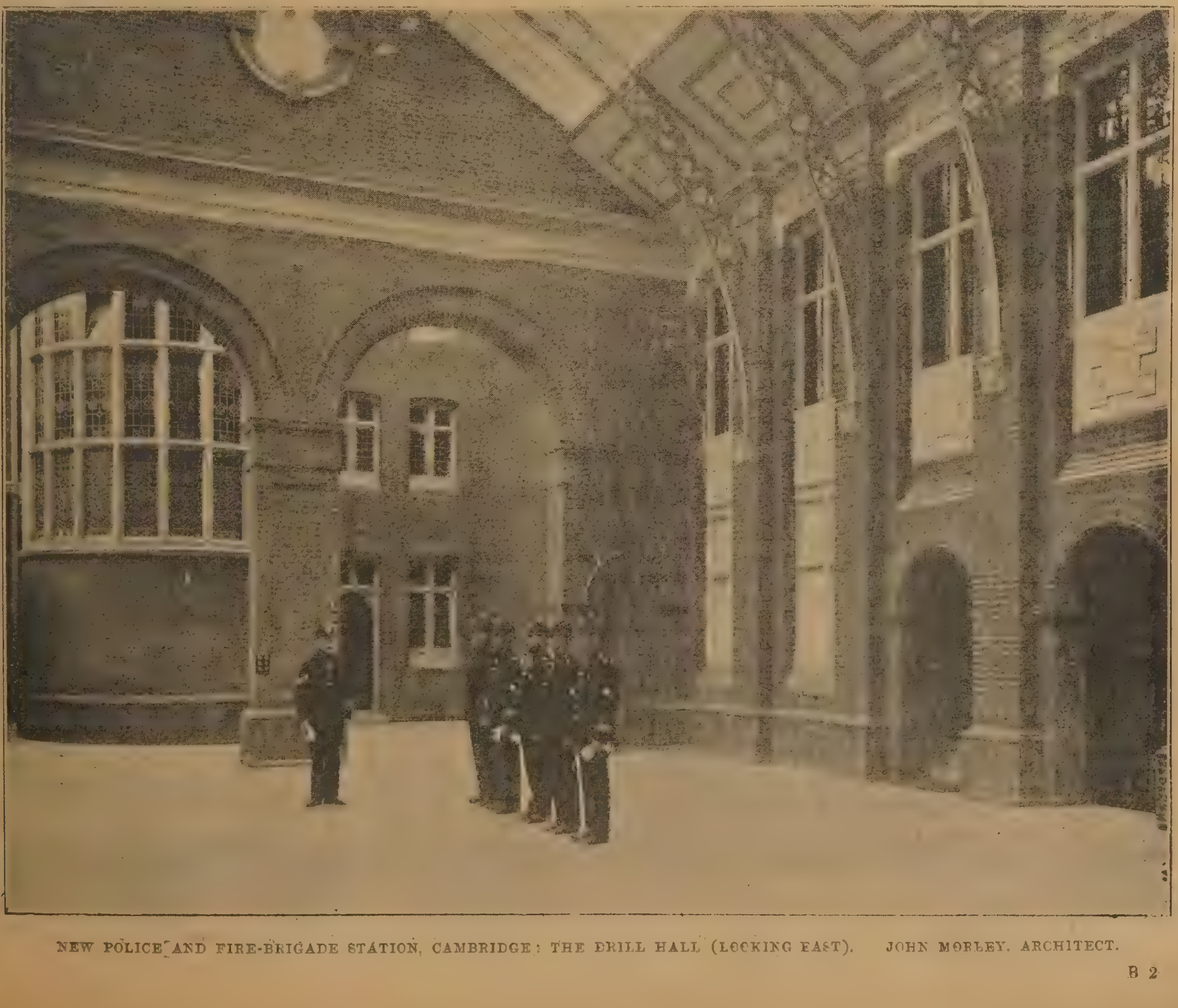
Mr. Anthony Lyons, builder and contractor, of Norton, Malton, sends us a booklet containing a portrait of himself and illustrations of buildings he has erected. This a new departure.

Fire at Builders' Premises.—Last Saturday week a serious outbreak of fire occurred on the premises of Messrs. Ross, builders, Claremont Road, Sparkbrook, Birmingham. A building consisting of two floors 100ft. by 25ft. was destroyed, and damage done to stacks of timber and sheds in an open yard and the backs of a row of houses. Messrs. Ross were not insured.

The Scottish Building Trades Federation held its seventh annual meeting of the Federation recently at Glasgow, when the following office-bearers for the ensuing year were appointed: President, Mr. Robert Lamb, builder, Edinburgh; vice-presidents, Messrs. Thomas C. Stocks, wright, Dundee, and John Morgan, wright, Aberdeen, together with eleven members of Executive in room of those retiring at this time; secretary, Mr. James L. Selkirk, C.A., Glasgow. The next half-yearly meeting of the Federation was appointed to be held in Perth, and the next meeting of Executive in Dumfries.

London County Council.—At last week's meeting the Water Committee recommended: "That a Bill be promoted by the Council in the session of 1902 for the purchase by the Council of the undertakings of the eight Metropolitan water companies, the Bill to be on similar lines to that of last session." Mr. R. A. Robinson moved the following amendment: "That, in view of the declared intention of the Government to introduce a Bill in the ensuing session for the creation of a water authority and the purchase of the water companies' undertakings, it is inexpedient for the Council to introduce a Bill dealing with the subject." A lengthy discussion followed, but eventually the amendment was rejected and the committee's recommendation adopted.

The Druidstone Riding School Collapse: Tie-Rods Misplaced.—In the course of the coroner's enquiry instituted into the circumstances connected with the deaths of a carpenter and a lad through the collapse of the Druidstone Riding School, Mr. A. Swash, architect, of Newport, stated that the accident was due to the tie-rods of the roof not being carried down to the base. There was no suggestion of scamped work, but the design was poorly conceived. There should have been more provision for wind-pressure. Mr. Conyers Kirby, architect, of Newport, opined that the lateral spreading of the outer posts caused the fall. Mr. Watkins, architect, of Cardiff, attributed the weakness to punched holes, as $3\frac{1}{2}$in. were taken from the $7\frac{1}{2}$in. The jury returned a verdict of "Accidental death," stating that the fall was due to constructive weakness by the tie-rod not being at the base of the roof-span.



NEW POLICE AND FIRE-BRIGADE STATION, CAMBRIDGE: THE DRILL HALL (LOOKING EAST). JOHN MORLEY, ARCHITECT.

OXFORD.

RESTORATIONS OF THE COLLEGES AND OTHER WORKS.

THE following particulars of works which have been or are being carried out at the colleges and other buildings in Oxford will doubtless be of considerable interest to our readers :—

Christ Church.

At the east side of Tom Tower restoration work has been in progress during the Long Vacation, the pinnacles, which terminate at about half the height of the building, being entirely renewed, and the decayed stonework in other parts replaced by new material. The work is being carried out by Messrs. Axtell & Butcher, under the direction of Mr. Bodley and at the cost of two members of the house.

New College.

The work of restoring the exterior of the chapel and dining-hall, which has now been carried on for the past three years, is approaching completion. A large amount of the stonework had fallen into decay, and where this has been removed Clipsham Down stone has been substituted, and the new carving has been executed in imitation of the old work, which dated in many instances from the time of the founder, William of Wykeham. The restoration is on a most complete scale and includes renovated buttresses, pinnacles, window tracery and labels, grotesque heads, cornices, parapets, &c. During the past twelve months the north transept of the ante-chapel, the north side of the chapel and dining-hall, and the east end of the hall have been dealt with, and a new turret has been placed on the west side of the north transept. A copper dowel has been fixed in each of the pinnacles and turrets, and the new stone is set in cement throughout. The architect is Mr. Basil Champneys, and the contractor, Mr. Bridgeman of Lichfield.

Merton College.

The canopies over the figure of St. John the Baptist at the north end of the chapel, on the outside, have been restored to their original design by the insertion of new fronts, pinnacles and finials complete. The tracery of the large window has also been partially restored, the whole being from the designs of Mr. T. G. Jackson, R.A.

Wadham College.

Among the works of restoration at this college are the pinnacles on the south end of the hall and the east side of the library, and the windows on the south side of the library, from the plans of Mr. T. G. Jackson.

Hertford College.

A considerable extension of this college has been commenced, a large space having been cleared at the corner of Broad Street and New College Street by the demolition of five houses. It is intended to provide twenty-four sets of rooms, and the structure, which will rise to a height of 50ft. at the ridge, will be of Gibraltar stone in the fronts, with Clipsham and Doulting stone dressings, and at the corner of Broad Street and New College Street there will be two oriel windows. The work of putting in the concrete foundations was begun a few weeks ago. The scheme of building will include, eventually, the whole of the site up to the Indian Institute and into Holywell Street, where several of the houses already belong to the college. The architect of the buildings is Mr. T. G. Jackson, R.A., and the clerk of the works is Mr. E. Long.

St. John's College.

The extension in St. Giles Street, which was in progress this time last year, is completed. The style is a replica of the rest of the college, and the accommodation afforded consists of six sets of undergaduates' rooms and a large lecture room. Mr. E. P. Warren, of Westminster, was the architect, the builders being Messrs. Benfield & Loxley.

The New Radcliffe Library.

This building, which is the munificent gift of the Worshipful Company of Drapers and cost about £20,000, is now completed. It is erected in the grounds of the University Museum, and will, it is believed, shelve 150,000 volumes, which, at the present rate, will allow of the development of the library for many years. The building was designed by Mr. T. G. Jackson, R.A., and the contractors were Messrs. Parnell & Son, Rugby. The heating was by Messrs. Haden & Son, and the fireproof construction by Messrs. Homan & Rodgers. An illustration of the exterior appeared in our issue for July 31st last.

Sheldonian Theatre.

The renovation of Robert Streater's beautiful allegorical painting on canvas, which forms the ceiling of the Sheldonian Theatre, has now been completed. The work was of the most delicate nature, the painting, which dates from the time of Charles I., having become cracked in thousands of places, while various portions of the canvas had become so rotten that it was found necessary to replace the disintegrated portions with new work. All the cracks in the painting have been filled by the operator with colour of hair-line fineness, and the old work has been thoroughly cleaned. The work of renovation was in the hands of Messrs. J. C. Nairn & Son, of Dublin, under the supervision of Professor Church, of the Royal Academy; Mr. Morrill of the National Gallery being responsible for the re-backing of the canvas.

St. Mary's Church.

At the University Church the paint on the stalls in the chancel and the panelling at the back has been cleaned off, and new flooring has been put under the stalls, together with new supports under the organ gallery, which were in a very bad state and were considered unsafe.

Morphological Laboratory.

This building, which is within the grounds of the University Museum, was commenced in July, 1898. It is now nearly completed. The architects are Messrs. J. J. Stevenson, F.S.A., and H. Redfern, the builders being Messrs. Symm & Co. The building contains on the top floor a laboratory, with desks for 100 students and the requisite convenience for carrying on the work, rooms for professors and for private investigation, storerooms for diagrams, &c., cloakrooms and lavatories for male and female students, and a well-lighted lecture theatre, accommodating 100 students, the entrance so arranged that it can be used by other lecturers without interfering with the work of the laboratory. The character of the architecture has been determined by the purposes of the building, which necessitated large windows of plate glass, giving uninterrupted light for microscopical work. The floors are of concrete, boarded over, as also the flat roof, with a covering of asphalt. The contractors for these were Messrs. Homan & Rodgers, and for the heating Messrs. Wantner, Smith & Co.

Radcliffe Observatory.

The tower which was begun last year for the reception of a new double telescope has been completed, and the work of thoroughly restoring the octagonal tower is now in progress. The stonework has become much decayed in places, and the restored portions include the carved capitals, the sculptures in relief (by Baron) on the frieze of the eight windows, and other parts of the structure.

Pathological Laboratory.

The plans for this building, which is also within the Museum ground, were prepared by Mr. J. Augustus Souttar, of London, E.C. The building, which was opened recently, consists of a partially sunk basement and two floors. Entering by the main door, access is given to a central hall from which, or from its gallery, all the rooms of the department open. Running up through both floors is a lecture room (25ft. sq. and 22ft. high) and a museum (31ft. by 25ft., and of a similar height), both being lighted from the north and east by roof-lights. Besides these, on the ground floor is a research-room for experimental pathology (25ft. by 18ft.), and another of similar size fitted up as a chemical research laboratory. On the first floor there is a room 43ft. by 18ft. for the teaching of pathological histology, and to this is attached a preparation room. There is also a classroom (31ft. by 18ft.) for practical bacteriology, a photographic room, and a demonstrator's room, &c. In the basement are a private laboratory, a dark laboratory, a large preparation room for the pathological and bacteriological work of the department, storeroom, room for heating apparatus, and workshop. The basement will also contain a refrigerating room 10ft. sq. and 8ft. high, kept below zero by one of Hall & Co.'s carbon-dioxide freezing apparata. The building is faced with Lawrence's red brick, with Bath stone dressings, and the roofs are covered with Broseley tiles. The contractors were Messrs. Symm & Co., and the cost was about £10,000.

New Board Schools.

During the year the School Board has erected three new schools, two of which, the Central Girls and Central Boys, were formerly opened on January 18th last. The third, known as East Oxford, was subsequently completed. Mr. Leonard Stokes was the architect. Other works which have been completed include an extension of the Eye Hospital (Mr. H. W. Moore, architect); the addition of new schoolrooms and a dormitory wing to Nazareth House (Mr. E. Goldie, of Kensington, architect); and a new Lloyd's bank at Carfax (Messrs. R. C. Davy and Stephen Salter, architects).

ILFORD MAIN DRAINAGE.

AT a meeting of the Society of Engineers held on November 4th, Mr. Charles Mason, president, in the chair, a paper was read on "The Main Drainage of Ilford" by Mr. Roger Gaskell Hetherington, M.A. The author first observed that the population of Ilford had increased by 35,000 during the last fifteen years, which necessitated considerable additions to the sewerage. The first drainage scheme was prepared by the late Mr. Brundel in 1882, when the population was only 7,500. The present scheme has been designed for a population of over 100,000 by Messrs. John Taylor, Sons & Santo Crimp, and the old system has been incorporated with it. The drainage area is such that one portion of it only can be drained by gravitation. The outfall works as first constructed became in time inadequate, and they were greatly enlarged in 1898, and the present system of dealing with the sewage was then started. This method consists of treating the crude sewage with milk of lime and ferrous sulphate and then passing it through settling tanks. From the settling tanks the effluent is taken into coke-breeze bacteria beds, and from thence to the River Roding, the sludge left in the tanks being pressed by sludge-pressing machinery. Owing to the works being required to deal with a considerably larger flow than that for which they were designed, the effluent has become unsatisfactory, and other modifications in the works are now being undertaken. The chief of these is the construction of an entirely new outfall to the River Thames. This effluent pipe will discharge into the Thames below the London Northern Outfall at Barking. As this outfall pipe, which is 30in. diameter, passes through a large tract of land lying below high-tide level, elaborate precautions have had to be taken to prevent tidal water being admitted to this low-lying land by any failure of the pipe. The scheme as a whole presents some interesting points as regards meeting the ever-recurring problem of treating the sewage of a district with a rapidly increasing population without discarding the existing system, which was never designed for great enlargement.

A New Branch Fire Station at Birmingham, intended mainly to serve the needs of Saltley and East Birmingham, is being erected at the corner of Lingard Street and Saltley Road. The builders are Messrs. Gowing & Ingram. The buildings, which are being erected from the designs of Mr. John Price, the city surveyor, are estimated to cost £7,500.

The Padiham Victoria Memorial Institute was opened recently in Burnley Road, and has cost £6,000 (including furnishing). Mr. Henry Ross, of Accrington, was the architect. The new building is of stone, and has a frontage of 88ft. and a depth of 130ft. The ground floor contains physical and chemical laboratories, lecture-theatre, weaving and manual instruction rooms, &c.; on the ground floor are classrooms, library, museum, &c., and on the first floor will be located the art-classes. The rooms are all lofty and well-ventilated. The building will provide accommodation for 400 students.

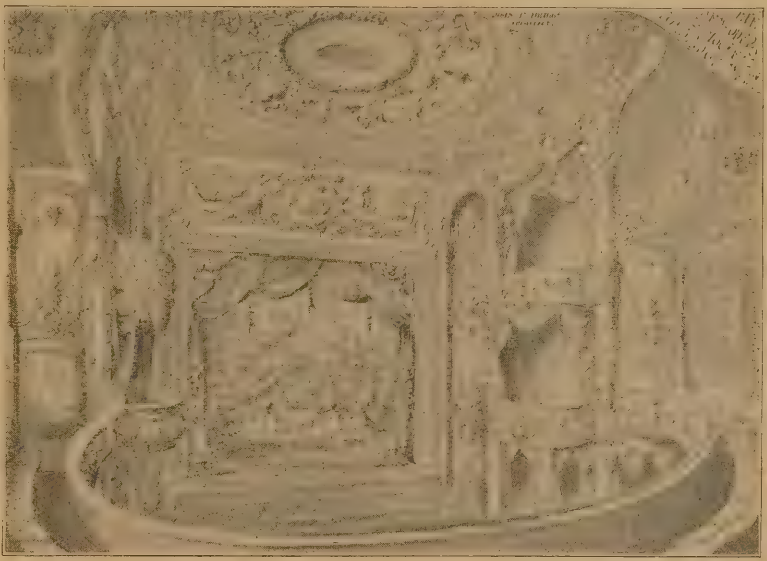
Bricks and Mortar.

APHORISM FOR THE WEEK.

"As an architect, therefore, you are modestly to measure your capacity of governing ornament. Remember, its essence—its being ornament at all—consists in its being governed."—RUSKIN ("Stones of Venice," Vol. I.).

Our Plates. THE chief condition imposed on the house at Oxted was to erect a three-storeyed building without a basement which was not to exceed 33ft. in height, and was to have a 10ft. ground storey: the whole, although erected on the summit of the Oxted hills, was to appear low. The site is unique, facing due south, and commanding views south and west over a vast stretch of country, and sheltered on the north and east by a fully grown copse. The south and west fronts are half-timber and pea beach rough-cast, and the north and east fronts are faced with hanging tiles. The hall and staircase, which form a separate wing, are made into an internal feature by lining the roof and gable with pitch-pine, V-jointed in narrow widths. The architect was Mr. Theodore Gregg, of St. Helen's Place, E.C.—The new opera house at Tunbridge Wells is now being erected. It is situated practically in the centre of the town, on a site lying between Calverley, Newton and Monson Roads. On this land some ten shops, premises for a bank, and eight warehouses also are to be built, and this property forms the basis of the financial undertaking, as the estimated rent-roll amounts to not less than £1,800 per annum, independently of any revenue from the theatre. The new buildings will cost over £30,000. The exterior of the opera house will present a massive and solid appearance. It is to be carried out in red bricks, with Bath-stone dressings, while the facade is to be in the Georgian style of architecture. Inside, everything will be effected with the idea of comfort and general convenience. There will be 120 orchestral stalls, 180 tip-up seats in the dress-circle, 170 pit stalls, 500 seats in the pit proper, and 300 seats in the upper of the two semi-circular galleries. Thus the total seating accommodation of the house will be 1,200. The proscenium opening will be 28ft. by 30ft., and the depth of the stage 38ft. by 50ft. In addition to the private boxes, the sides of the house immediately adjacent to the stage will be occupied by rows of ornamental pipes for the proposed organ, which is to cost £200. The decorations will be in Louis XIV. style.—St. Martin's Church is about to be erected upon a site that has been acquired by the trustees at Maxton, a suburb of Dover. The church will consist of nave, aisles and transepts, chancel, vestries for clergy and choir on the northern side of chancel, and main entrance on the southern, with organ-chamber over. At the west end of the church will be the baptistery and entrances. The building is to externally of red bricks, Portland stone weatherings to buttresses and copings and dressings to doorways and lower windows. The roof will be covered with green slates, and at the intersection of nave and transept roofs a ventilating flèche will be constructed. Internally the walls and arches will be of red bricks, the columns and springers of Bath stone. The roof will be formed over the nave, barrel-shaped, with moulded ribs, and the ceiling to the chancel will be centre-panelled. The nave floor is to be laid with wood blocks and the chancel with tiles. The seating to nave is to be of yellow deal, and the choir stalls of oak; the total seating accommodation is for 600 adults. The architects are Messrs. W. J. Jennings, F.S.I., & J. F. Duthoit, A.R.I.B.A., of Dover and Canterbury.

Queen Victoria Memorial. MR. SIDNEY R. J. SMITH, F.R.I.B.A, F.S.A., writing to the "Times," says: "On looking at the Victoria Memorial designs from a practical point of view (and I regret that this is necessary, for artistically the selected design is very satisfactory, though not perhaps quite what French art would do in a similar position and circumstance), it seems to me that in the event of a procession having to pass along the processional road all the chief features in the design would have to be cased up, and railings put on balustrades for safety of public, or the public entirely kept out of the processional road. This has more than ever impressed itself on my mind, for in walking down Piccadilly the other day every moulding, balustrade or foothold on which anyone can stand had to have a wood casing; and what would be the effect if a procession had to pass down the road shown on any of the designs (especially two of them)? I saw that it would be necessary to do a vast amount of casing, to put up temporary railings for safety, and employ quite an army of police to protect the 'architectural features,' which are in any case sure to be damaged."—Lord Grimthorpe suggests that a competent mathematician should "calculate from the published dimensions of this 'noble monument' (as it is called) how much its total bulk will exceed that of a small church-tower of the same height and a base 20ft. sq. And then the Government ought to stop its progress until there is created *in situ* a full-sized model, of either wood or brick plastered, for the public to look at. In no other way can they judge of such a structure as a lop-sided pyramid. He might also calculate its proportion to the bulk of 'the Great Pyramid,' of which the dimensions may be found in various books."—Mr. Howard Ince says that Mr. Webb's design involves the conversion into roadway of nearly an acre of the lake in St. James's Park, and of more than three acres of the Green Park. "No doubt the Committee is prepared to meet the enormous cost, probably at least two millions."



NEW OPERA HOUSE AT TUNBRIDGE WELLS. JOHN P. BRIGGS, ARCHITECT.

County Surveyors in Private Practice. A GENERAL MEETING of the Architectural Association of Ireland was held last week. Mr. T. E. Hoodlum presided. Mr. Anthony Scott, M.S.A., moved:—"That in the opinion of this meeting of the members of the Architectural Association of Ireland, the present system under which county surveyors of Irish counties are permitted to engage in private practice constitutes a serious grievance and injury to the members of the allied professions of architecture and engineering; and that our secretary be directed to send copies of this resolution to the Chief Secretary and the Parliamentary representatives for the city and county of Dublin." He pointed out that the county surveyors were paid salaries ranging from £500 to £1,000 a year, and had a great deal of official work to do. They were placed in an unfairly favoured position to secure private work. He considered that the present state of affairs was an injustice to private practitioners and to the ratepayers also, because the latter paid a salary which ought to secure to them the entire services of the county surveyors. Mr. Butler, in seconding the resolution, said it was monstrous that men drawing big salaries for official duties should scoop up the best part of the private practice that was available. He suggested that the Association should appoint a small committee to deal with the matter, and moved to add a clause to this effect to Mr. Scott's motion. After some discussion, the resolution thus amended was unanimously agreed to. Mr. Johnston Roberts, solicitor, read a paper on "Some Law Points Useful to Architects."

Birmingham Architectural Association. IN their report for the twenty-seventh session the Council announce a successful year's work. Two members and ten associates were added to the roll during the past year; and in order to broaden the basis of the Association a new order of membership has been formed for associated craftsmen. The travelling studentship was awarded to Mr. W. E. Carless. Several excellent sets of drawings were submitted, and the Council hope that the interest taken by the associate members in this competition will increase during the coming year. With reference to the class of design it is stated: "One cannot too strongly emphasise the importance of the study of old and good work as an aid to design; its value in educating the eye to understand and appreciate scale, good proportion and refined detail cannot be overestimated; and the difference in the work of students who have given time to such studies is particularly noticeable." During the past year two visits were paid to works in progress; one to the church of St. Agatha at Sparkbrook (of which Mr. Bidlake is the architect), and the other to Mr. Arthur Harrison's new offices at Sparkhill for the Yardley District Council.

Architectural Association of Ireland. AN exhibition of drawings prepared by members of the Association has recently been held in the rooms of the Royal Institute of the Architects of Ireland by the kind permission of the president and council of that body. The drawings consisted of the competitive works of members for the various prizes offered during the past session. Nine large sheets of measured drawings of St. Patrick's Cathedral, Dublin, by Mr. T. A. Rockett, won the Association Travelling Studentship. Another set of measured drawings were shown of Mellifont Abbey by Mr. A. C. Scott, of Drogheda. Seven sets of drawings were shown which had been prepared in competition for the prize offered by the Royal Institute of the Architects of Ireland for the best design for a technical school. Mr. Charles Powell secured this prize. Three sketches of the Campanile in the Quadrangle at Trinity College were on view, one by Mr. L. O'Callaghan taking the Beckett prize. The class drawings showed good progress.

A Bronze Statue of the late Daniel Owen, the Welsh novelist, was unveiled at Mold, Flintshire, recently. Mr. Goscombe John was the sculptor.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Drainage Connections from Adjoining Premises.

PERPLEXED writes: "A. holds premises on lease subject to a drainage connection from adjoining premises held on agreement by B. from the same landlord. A. covenants to pay his proportionate share of cleansing and repairing drain. The L.C.C. orders a sanitary inspector of drains on B.'s premises. The local sanitary inspector, who has sanctioned the alterations on B.'s premises of late years, now opens and finds the drains defective on A.'s premises, and compels the landlord by a magistrate's order to carry out his requirements, and make a new combined drainage for both premises. This is done after due notice has been given to A. of the summons and magistrate's order. The landlord will pay for all the new drainage on B.'s premises, but is he liable for the whole cost of it on A.'s, or can he recover from A. a proportionate part? Does the clause to repair and cleanse become inoperative, because the sanitary inspector orders an entirely new drain? A.'s lease has run nine years out of nineteen."

We consider you are liable for the partial cost of the reconstructed drainage, especially considering the length of the lease.

Cleaning Brickwork after Fire.

DERBY.—R. W. writes: "I am endeavouring to remove smoke and fire stains, caused by a fire, from the exterior of a factory constructed of red brick. Can you suggest anything better than clean water and a hard brush."

We do not think you will be able to remove the stains entirely. The usual plan is to rub or scrape the brickwork down to a clean face. A hard brush and water would be ineffective.

Conversion of Concentrated into Distributed Loads.

SOUTHPORT.—ACORN writes: "On p. 201 of your issue for October 30th, in the reply to 'Stock Sections' is there not some slight mistake?—for in finding the bending moments for the concentrated loads at the points of application, you give:—

(1) Under the 6-ton load = 7·3 (5) = 36·5ft. tons.
(2) „ „ 8 „ „ = 7·3 (5) = 8 – 6 (8) = 46·9ft. tons.

I cannot see anything to follow in the method marked (2), for in working back you give:—

Under the 6-ton load = 6·7 (7 + 8) – 8 (8) = 46·9.

How does method (2) equal 46·9?"

A misprint occurs in the answer to this question, namely, in the seventh line of the small type it should read "Under the 8-ton load = 7·3 (5 + 8) – 6 (8) = 46·9ft. tons." Querist has also a misquotation where he says "Under the 6-ton load = 6·7 (7 + 8) – 8 (8) = 46·9." This should be as given in the BUILDER'S JOURNAL, p. 201, "Under the 6-ton load = 6·7 (7 + 8) – 8 (8) = 36·5ft. tons." Perhaps he will now be able to follow the calculations.

HENRY ADAMS.

Ventilation of Art Gallery.

LONDON, S.E.—VIGORNIA writes: "I am designing a glass roof for an art gallery, and am showing the ventilation by means of casements hung at the bottom to fall inwards, as shown on the sketch (not reproduced). Will this be satisfactory, and if not, what would you suggest?"

Outlet ventilators should as a rule be as near as possible to the highest part of the ceiling, but those shown at base of curved roof and falling inside look as if they should be efficient. If other ventilators be added in the flat portion of the roof, they should be Boyle's extracting cowls with ornamental rose grating below.

HENRY ADAMS.

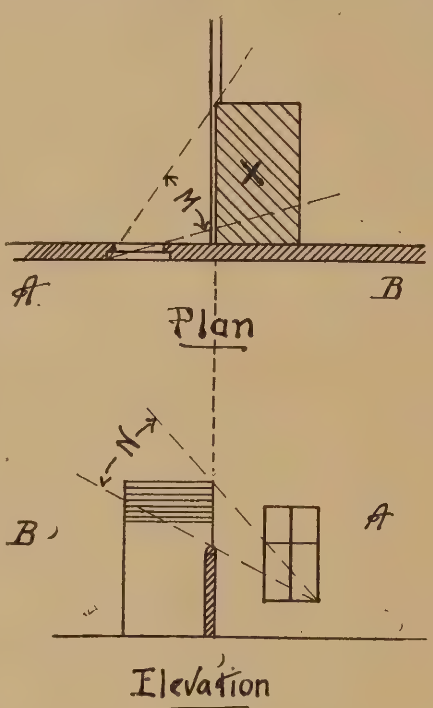
Strength of Bath Stone.

MALVERN.—X. Y. Z. writes: "I thank you for the reply on p. 201 of your issue for October 30th, but, considering the careful particulars given, I certainly expected a better reply. I anticipated a definite reply, not so many formulæ for calculation, or, at any rate, the formula worked out. Cannot Prof. Henry Adams give me something more definite than this? I am continually referring to the BUILDERS' JOURNAL, but really an answer like this is hardly worth writing for."

A correspondent replying in the way "X. Y. Z." has done hardly deserves further attention, but I may say that in the notes on p. 201 he was provided with the means of working out for himself by simple arithmetical calculations the particulars he required. He gave a careful and neat sketch of the arcade, but did not give the load to be carried by the columns or the nature of the foundations, so that the result could only have been approximately estimated by anyone else. HENRY ADAMS.

Ancient Lights.

WAVERLEY writes: "B. erects an one-story lean-to, as shown by the hatched portion X on the accompanying sketch. Can A. claim damage from B. in respect of right of light? If so, how would same be demonstrated on paper? Some contend that the obstruction must be immediately opposite the ancient light, and that a lateral erection like X is no infringement. The property has been erected for more than twenty years."



There would be obstruction, but only to a slight extent, the maximum being shown on illustration as within the angle M on plan and the angle N on elevation. If the mean obstruction were required (and it would be the more correct), these angles should be taken from the centre of the inside of the window sill. The loss of light would in this instance be so small that A. would probably obtain but small damage were he to bring an action, unless the windows were used for purposes requiring all available light. It would only be worth his while to act in order to prevent the creation of a precedent for further infringement of his right.

G. A. T. M.

Laundry Plant.

LONDON, S.W.—SANITAS writes: "Kindly give me an idea of the machinery and other necessary plant for the equipment of a small laundry in the country. The particular laundry in question is to serve a hospital of about twenty beds with a staff of six nurses, perhaps a total of thirty persons."

A complete reply to this enquiry would occupy too much of our space, but "Sanitas" can find the information he seeks by consulting Mr. John Taylor's book on "The Steam Laundry," published by Heywood & Co., Ltd., 150, Holborn, E.C.; price 7s. 6d.

Moment of Inertia.

NEWPORT, MON.—A. L. R. writes: "In the table on p. 73 of Messrs. Dorman, Long & Co.'s book of steel sections, a 9in. by 7in. girder is given of three different weights, and consequently of varying sectional areas; yet the vertical, or greatest, moment of inertia is stated to be 216·81, and the horizontal, or least, 46·59, for all three. I should be glad if you would thoroughly explain this, and state how the horizontal moment is obtained. Can you also name a good book showing how to find the centres of gravity of various shaped surfaces and bodies, and the best book on the 'Development of Surfaces'?"

The moment of inertia is explained on p. 14 of our issue for February 6th last, and in the article on building construction in this issue. We advise you also to consult Rankine's "Manual of Applied Mechanics," Rivington's "Building Construction, Vol. IV.," and Hurst's "Surveyors' Handbook." Lock's "Elementary Statics" explains how to find centres of gravity. The subject of the development of surfaces has not been comprehensively dealt with in any one book, but you will probably find all you require in the "Encyclopædia Britannica," J. F. Heather's "Practical Plane Geometry" and "Descriptive Geometry" (Crosby Lockwood), and E. W. Tarn's "Practical Geometry" (Crosby Lockwood).

Machine Joinery.

LONDON, S.E.—E. H. C. writes: "Please name a good book on machine joinery work in hard and soft woods."

We do not know of any book on machine joinery, nor do we think there is one. You should consult works on joinery, names of which can be obtained from Mr. B. T. Batsford's list of books. You should also consult manufacturers' circulars and catalogues.

Books on Architecture.

PUDSEY.—C. H. P. writes: "Who is the publisher and what is the price of the two books by Prof. T. Roger Smith?"

"Architecture, Classic and Early Christian," by T. Roger Smith and John Slater (5s.), and "Architecture, Gothic and Renaissance," by T. Roger Smith (5s.), are published by Messrs. Sampson Low, Marston & Co. Mr. B. T. Batsford publishes a list of standard books on architecture.

Brewery Chimneys.

F. W. writes: "Is there any book published on the building of brewery chimneys, with specifications?"

See "Breweries and Maltings, their arrangement, construction, machinery and plant," by G. Scamell, F.R.I.B.A., published by E. and F. N. Spon, price 12s. 6d.

Joints in Elliptical Arches.

HULL.—P. C. S. writes: "Which is the proper method of finding the joints in an elliptical arch?"

The joints should be normals to the curve, but as this necessitates different moulds for each voussoir the arch is usually struck from three centres, as this approximates to the true ellipse.

Books of Dimensions.

TIMPERLEY.—TEAK writes: "Is there any book dealing exclusively with dimensions of various parts of buildings and their fittings, such as heights of handrails, seats, lockrails of doors, &c.?"

Consult "The Principles of Architectural Planning," by Percy L. Marks (B. T. Batsford, 6s.) and "Specification" (5s.)

Air-Space Around Buildings.

STONE.—R. A. writes: "A plan was recently submitted to a local surveyor for approval. He has rejected it on on the ground that it contravenes by-law 54 (copy enclosed). Not being altogether satisfied with his explanation, I should be glad to know your interpretation of it."

The surveyor to the sanitary authority appears to be technically correct in his contention that the plan does not strictly comply with the by-law in question (relating to air-space about buildings, &c.), but it is probable that a slight rearrangement of the new buildings in their relation to the existing dwelling-houses would meet the local requirements. T. E. C.

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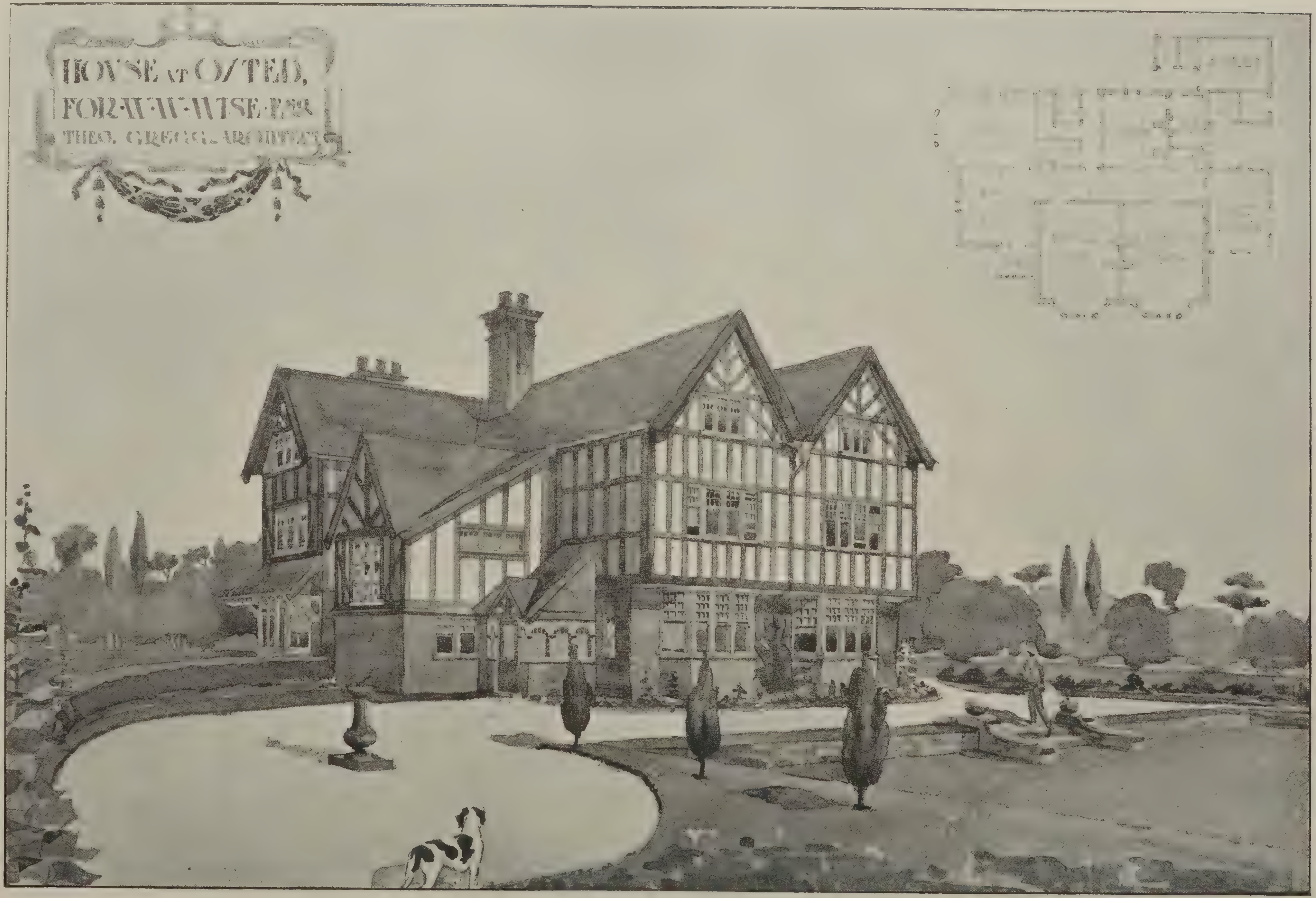

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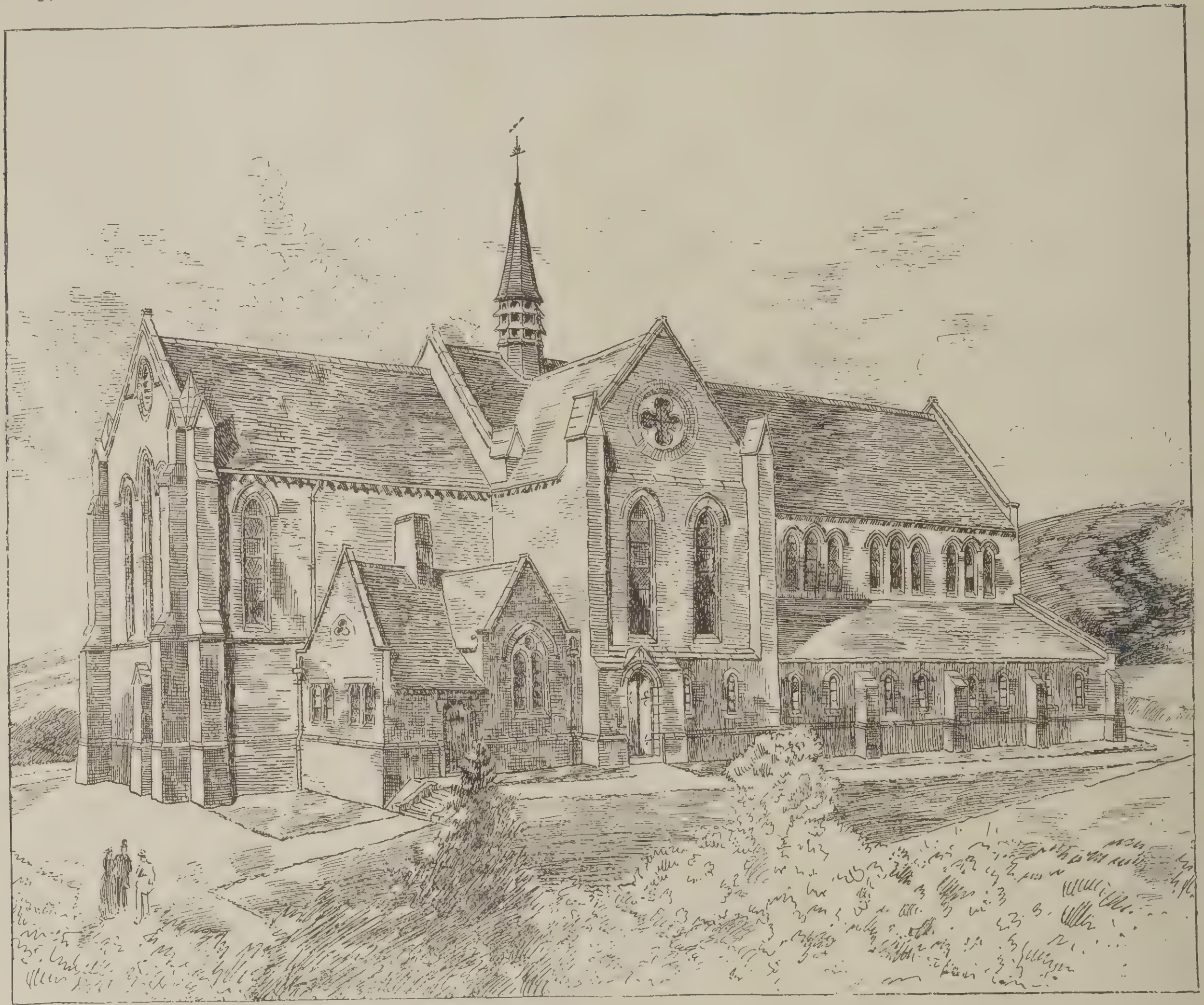

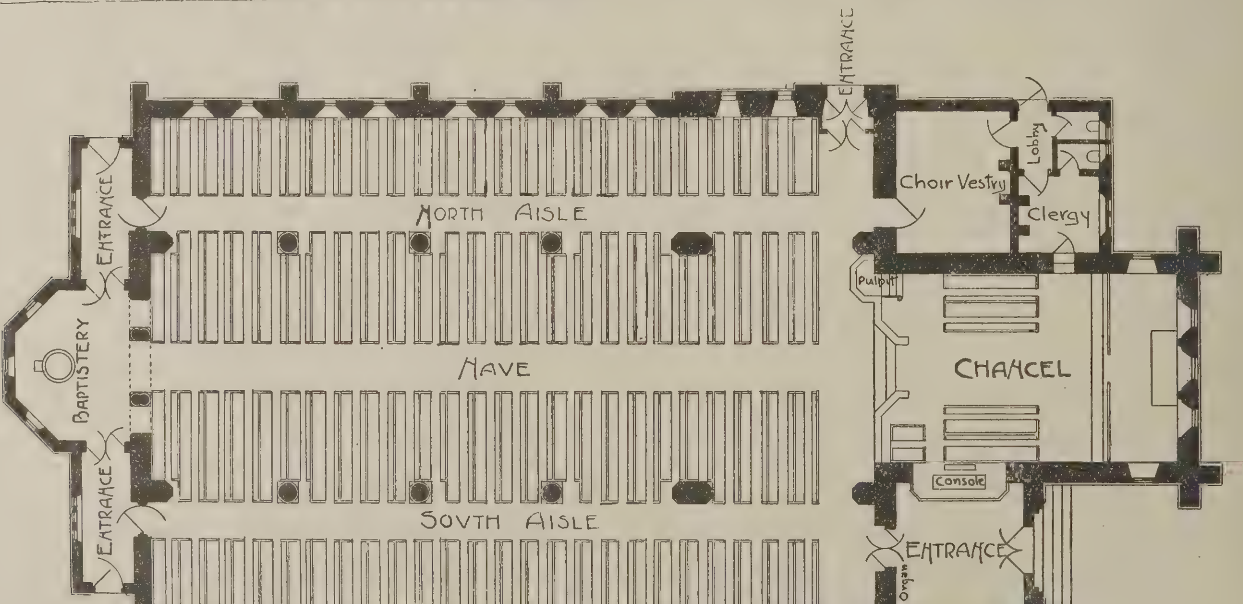

ST. MARTIN'S CHURCH, DOVER. W. J. Jennings and J. F. Duthoit, Architects.

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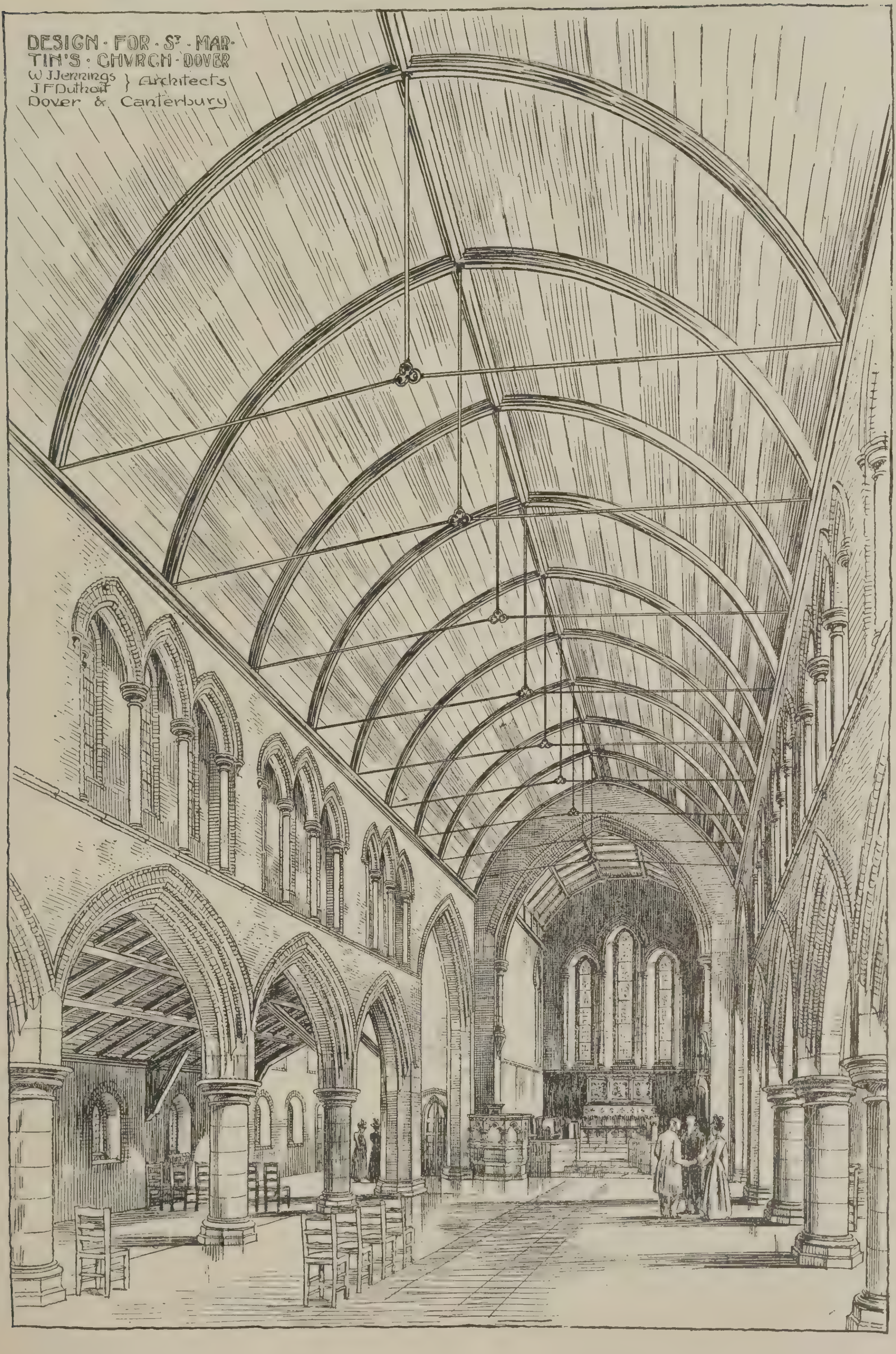

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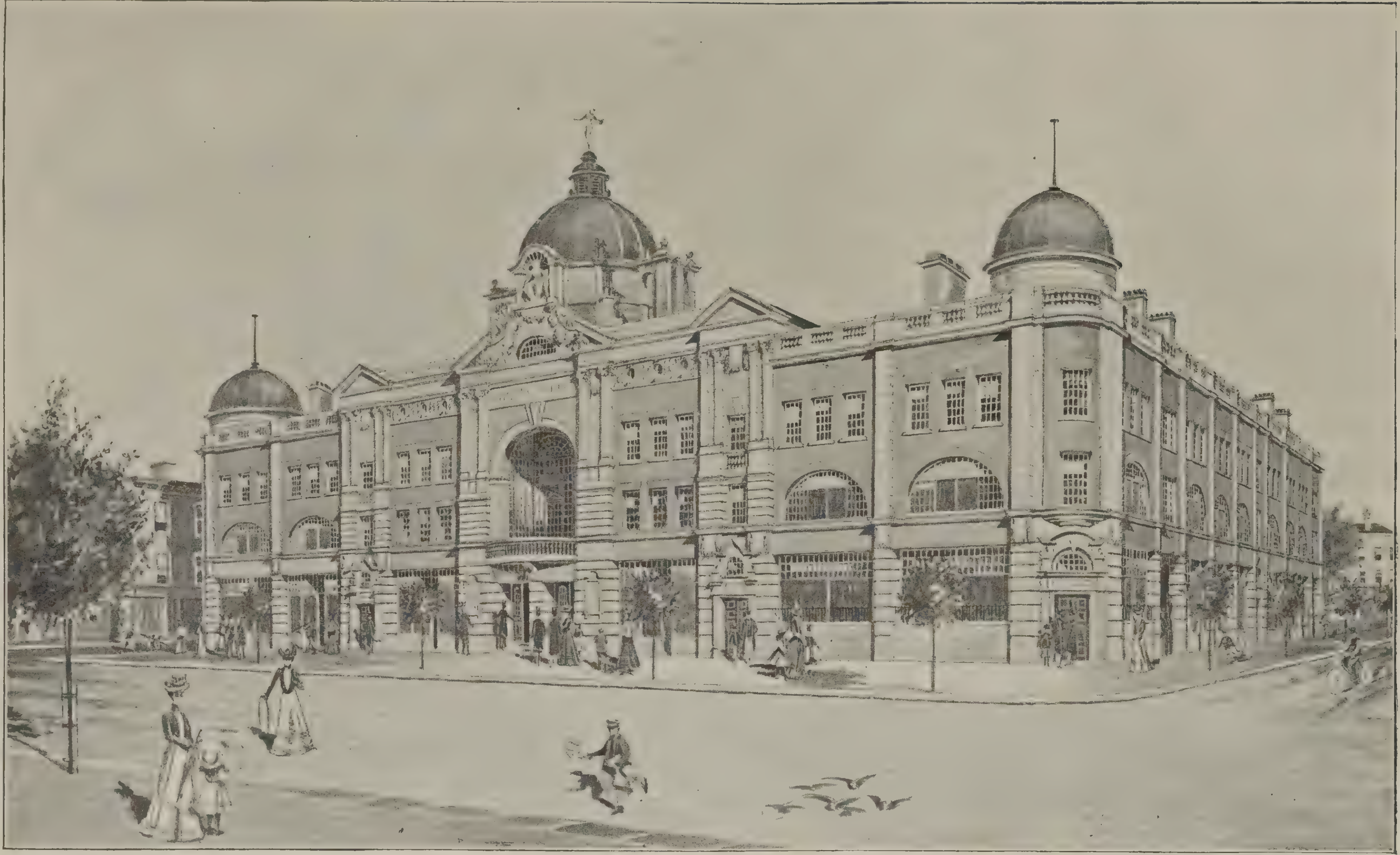

NEW OPERA HOUSE, TUNBRIDGE WELLS. JOHN P. BRIGGS, Architect.

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Engineering Notes.

The Institution of Junior Engineers held its inaugural meeting recently. Sir Lowthian Bell, F.R.S., the retiring president, occupied the chair during the first part of the proceedings, and announced that the Northcott prize had been awarded to Mr. William Powrie for his paper on "The Mutual Relations of Employers and Employed," and the Institution premium to Mr. Samuel Cutler, jun., for his paper on "Carburetted Water Gas." Sir John Jackson, his successor, then took the chair, and delivered his presidential address.

Hackney Electric Lighting Scheme.—Extensive works for the Hackney Borough Council in Millfields Road, Lower Clapton, for providing the district with electricity, have been opened. The site has cost £8,000, and the whole block, including a chimney shaft 200ft. high, is estimated to cost £277,000. The buildings have a frontage to the River Lea. The system under which electrical energy is supplied may be described as a low-pressure continuous-current direct-supply at constant pressure, on the three wire method. Mains have already been laid in twenty-five miles of streets, which represents about 118 miles of cable. The prices for electricity are for private lighting 4d. per unit, and for motive power 2d. per unit. A "free" wiring system has been adopted. A feature of the scheme is the utilization of refuse for the production of energy. When the entire scheme is completed the refuse will be put into the destructor, which consists of twelve furnace cells, capable of burning 160 tons of refuse in twenty-four hours, and it will be burnt at a high temperature with the assistance of a powerful fan blast. The gases given off will supply a large amount of heat energy, which will be utilized for the purpose of raising steam in three water-tube boilers. Arrangements are made for the automatic handling of the refuse, so far as that is possible, from the moment it is tipped at the works to the time when it emerges from the furnace in the form of clinker. Mr. Robert Hammond was the consulting engineer.

A New Bridge at Chatham is being erected over Railway Street in place of the old brick arch, which had existed for over 120 years, but had a width of roadway under the central arch of 18ft., with 4ft. 6in. piers, and openings for footpaths 6ft. on either side—total width over all, 39ft., the minimum clear headway at the centre of the roadway being 17ft. 3in. to the crown of the arch; the width of bridge over all being 23ft., with a clear width of bridge between parapets in New Road over the brick arches of 20ft. In the new bridge a clear headway of 17ft. 4½in. will be provided continuously across the roadway; and allowing 29ft. 6in. for roadway and 7ft. 4½in. for each footway, a width of 44ft. 3in. running east and west will be provided. Upon the upper surface of the new bridge a width of 45ft. will be provided running north and south, giving a carriage way of 30ft. wide and two footways each 7ft. 6in. wide. The new bridge and its approaches are being executed to the design of Mr. Arthur T. Walmisley, M.Inst.C.E., of Westminster, and include a fire station having an area of about 2,250 super. ft., fitted up with engine-room, fire escape, manual, hose cart, &c.; a drill-hall and office upon the west side of the bridge; and a public sanitary convenience, with an area of about 675 sup. ft. upon the east side of the bridge. There will be about 200 tons of steel in the construction, supplied and fixed by Messrs. E. C. & J. Keay, of James' Street Bridge Works, Darlaston (offices, Corporation Street, Birmingham). The remainder of the work is being executed by the Corporation's own workmen, under the supervision of Mr. Charles Day, the borough engineer; Mr. Arthur Horrox acting as clerk of works. The roadways hitherto had varying gradients. The west portion of the approach will have a gradient of about 1 in 40·3 for a length of about 277ft., then a level roadway for a length of about 57ft. across the bridge, and then joining the existing road upon the east side a gradient of approximately 1 in 35. An ornamental cast-iron handrail will form the parapet of the approach, south side; while that on the north side will consist of a brick wall.

FIRE-TESTS.

THE British Fire Prevention Committee have just issued the following four reports:—

Publication No. 61 refers to a 2½ hours' test made with a floor of steel joists and coke-breeze concrete, the lower flange being protected. Similar floors are frequently used by the London County Council in their buildings. The floor measured 10ft. by 7ft. 3in. and had two 7 by 3½ steel joists weighing 16lbs. per ft. run, spaced at 3ft. 4in. centres. The concrete consisted of coke-breeze and Portland cement in the proportion of 5 and 1, and was 9in. thick. Six weeks (spring) were allowed for construction and drying. There was no load on the floor. The following is a summary of the effect of the fire, the temperature of which ranged from 500 deg. to 2,300 deg. Fahr:—After 12 minutes plastering began to fall from the soffit, but beyond this no other effect was observed during the test. The fire did not pass through the floor. On the application of water the soffit of the concrete, where struck by it, was disintegrated for about ¾in., otherwise it remained sound.

Publication No. 62 refers to a test with a wood floor and ceiling protected by an additional suspended ceiling made by Banks' Fireproof Construction Syndicate, Ltd., of London. The test lasted an hour and a half, the temperature gradually rising to 2,000 deg. Fahr., followed by the application of water for two minutes from below. The following is a summary of the effect:—In 3 minutes portions of the setting coat of the suspended ceiling began to fall, and continued to fall throughout the test. When water was applied a portion of the floating coat was washed away, exposing the helical metal lathing. No fire was observed to have passed through the floor. Twenty minutes *after* the test was over the wood floor caught fire, and was extinguished. Two days later the floor boards were removed and it was found that the wood laths to a portion of the ceiling in the centre, for about 1yd. super., had been consumed, the under side of the wood joists was charred, and the ceiling had fallen away. The rest of the plastering and joists were sound, and the general stability of the floor unaffected.

Publication No. 53 refers to a test with a "Cunnah-Wright" partition erected by the Fireproof Partition Syndicate, Ltd., of London. The test lasted one hour and a quarter, the temperature rising from 500 degs. to 2,000 degs. Fahr, followed by the application of water for two minutes on the fire side. The area of the partition was about 80ft. super., with a width of 10ft., and four weeks (winter) were allowed for construction and drying. The following is a summary of the effect:—Hair cracks, from which the steam escaped, appeared from time to time on the passage side of the partition. The temperature on the outside face during the latter part of the test was too hot to bear the hand and paper held against it was scorched. The fire did not pass through the partition, which however fell bodily inwards when water was applied to the fire side. The makers have applied for a further test with a partition, and will allow a longer time for construction and drying, though the test will be limited to one hour.

Publication No. 58 refers to a test with a suspended partition also erected by the Fireproof Partition Syndicate, Ltd. The partition had dovetail corrugations 1⅝in. by ⅞in., and after being plastered measured 3¼in. thick, the plaster on the inside being ¼in. thicker than that on the outside. The test lasted one hour, the temperature rising to 2,000 degs. Fahr., followed by the application of water for two minutes. The following is a summary of the effect: The iron framework and steel sheeting forming the partition were found to be intact after the test, but two of the studs were bulged, and a small portion of the steel sheeting was burnt through and perished next to the centre stud. The temperature outside the partition next the passage was not sufficient at any time during the test to affect the recording points of the pyrometer, but the hanging thermometer on the face of the partition registered 200 degs. Fahr. in 55 minutes. Most of the plaster inside the chamber fell during the test, and the remainder was disintegrated, bulged, and ready to fall.

Law Cases.

Workmen's Compensation: "Average Weekly Earnings."—The case of *Ayres* v. *Buckeridge* came before the Court of Appeal on Wednesday last. This was an appeal from a decision of the judge of the Brentford County Court in an arbitration under the Workmen's Compensation Act, 1897. The applicant for compensation was the widow of Francis Ayres, a labourer, who sustained fatal injuries through an accident while assisting to demolish a building at Ealing. He was at the time in work at Whitechapel, and the question arose what rate of wages would be remunerative to him, taking into account the fact that he would have to travel to his work. In the result it was arranged that he should be employed for eleven hours a day for five days in the week and for five hours a day on Saturday, making altogether sixty hours a week, and that he should receive payment at the rate of 7½d. per hour. He was not employed for any specified number of weeks, and he was liable to be discharged from the employment at an hour's notice. It was stated that an ordinary workman in the position of the deceased would probably be employed from forty to fifty hours a week. The deceased did, in fact, work in his employment for four days, including the day on which he met with the fatal accident, and he worked for eleven hours on each of the four days. The county court judge made an award in favour of the applicant for £292 10s. He calculated this sum on the basis that this was the amount which the deceased would have earned if he had been employed for sixty hours a week at the rate of 7½d. an hour for a period of three years. The employer appealed, and it was argued on his behalf that the amount of compensation ought to be based on the amount of wages in fact received by the deceased during the time that he was actually employed. The period of his actual employment was forty-four hours in the first week of the employment. Wages at 7½d. an hour for forty-four hours amounted to £1 7s. 6d. On this basis the award ought to have been for £214 10s. The arguments in the case having been heard, the Master of the Rolls said the next two cases in the list—*Wheale* v. *Rhymney Iron Co., Ltd.*, and *Jones* v. *the Same*—he believed raised the same point. The two appeals were then argued, after which the Master of the Rolls gave judgment. He came to the conclusion that where a man was not in the same employment for two weeks or more the words in the Act, "average weekly earnings during the period of his actual employment under the said employer," must be treated as not applying to such a case at all. Where you had employment for more than two weeks the Act was clear enough, but where you had not the Act was silent. Then the county court judge must assess the award on the hypothetical basis of what the man's average weekly earnings in that employment would have been—that was a question of evidence, a question of fact for the judge of first instance to decide. Unless, therefore, it could be shown that the judge had misdirected himself, his ruling could not be interfered with by this court on the question of amount. The award made in each case would therefore stand, and the respective appeals dismissed with costs. The Lord Justices concurred.

The "Tube" and Smoke Nuisances.—At West London last week a batch of summonses came on for hearing against the Central London Railway Company in respect of the alleged annoyance caused by the issuing of black smoke from the two shafts at the electrical generating station in Wood Lane, Shepherd's Bush. Mr. Horace Avory said the company were in a predicament which deserved the sympathy of the Court. It was true that a Welsh coal was used in September, but on the 2nd of that month the whole of the service of trains was stopped, as it was found impossible to keep up the necessary quantity of steam, and they felt bound to revert to the use of the old kind of coal to keep up the quantity of steam. He suggested an adjournment to allow the company to test the power of the new boilers which they were engaged in substituting for the present appliances. Mr. Lane, K.C., said he was disposed to close the case by imposing moderate fines, but he should deal with it differently if it came before him again. He imposed penalties amounting to £10, with twenty guineas costs.

Roadmaking and the Workmen's Compensation Act.—On Saturday last in the Court of Appeal the case of *Ellison* v. *Longden & Son* was heard. This was an appeal from the Sheffield County Court in an arbitration under the Workmen's Compensation Act, 1897. The applicant for compensation was a workmen who was injured while blasting large boulders of stone on Loxley Common for the purpose of making a road. The explosion took place about 6yds. from the mouth of a tunnel running into the side of a hill. The Court dismissed the appeal. The Master of the Rolls thought the county court judge had abundant evidence to justify him in finding that the applicant was employed on or in or about a mine within the meaning of section 7, sub-section 1, of the Act. The Lords Justices delivered judgment to the same effect.

Architects as Arbitrators: Important Case.—The case of *Belcher and Another* v. *the Roedean School Site and Buildings, Ltd., and Another* came before the Court of Appeal on November 4th. Mr. Ralph Neville, K.C., said that the company was established for the purpose of erecting buildings for a well-known school at Brighton, and the respondents on the appeal were a Mr. Belcher and also the trustee in bankruptcy of the contractors who had contracted to do some of the brickwork in the erection of the school. The appeal was from a decision of Mr. Justice Laurance revoking the submission to the architect in the builder's contract. The learned judge revoked the submission altogether on the ground, as he (counsel) understood it, that there was litigation pending between the architect and Mr. Belcher. The contract price was £48,589. Mr. J. W. Simpson was the architect. Clause 4 of the contract provided that the works must be completed to the architect's satisfaction on or before September 1st, 1898, provision being made for penalties for delay. Clause 16 provided for the payment of the contract price by instalments upon the architect's certificate, and provision was also made for the determination of the contract in the case of the bankruptcy of the contractors, &c. Clause 26 provided for a full reference to the architect of all disputes and matters which might arise between the building owners and the builders. Counsel went on to state that on September 1st, 1898, the buildings were very far from completion, and the builders being at that time very short of funds loans were made to them by Mr. Belcher and other people on the credit of the contract. Notice was given of these advances, and the lenders got a charge on the builder's contract. On January 27th, 1899, the architect gave the contractors notice to proceed with the work under the 20th clause of the contract, and on their failure to proceed according to his satisfaction, on February 1st, 1899, the building owners served notice to determine the contract On the same day a petition in bankruptcy was presented by the contractors, which was followed by a receiving order. Then the work was taken over in accordance with the terms of the contract by the building owners, and completed under the inspection of the architect; and on June 27th, 1901, the architect issued his final certificate, which showed a balance due to the contractors, above the amounts paid to them, of £350 13s. 5d. This was sent to the trustee in bankruptcy of the contractors, accompanied by a statement of accounts by the Roedean School Site and Buildings, Ltd., in which they showed that in consequence of the non-completion of the works in accordance with the contract there was a balance due to the company of £1,255 7s. 5d., after deducting the £350 18s. 5d. due to the contractors on the architect's final certificate. On July 6th, 1901, the solicitors to the company wrote to Mr. Simpson asking him to make an appointment as arbitrator under the contract, but both Mr. Belcher and the trustee refused to acquiesce in the reference to Mr. Simpson. On July 23rd the arbitrator held a sitting, but as only the company appeared he adjourned it. On the same day Mr. Belcher issued a writ against Mr. Simpson, the architect, claiming damages for misrepresentation on the ground that Mr. Simpson had given him wrong information when he (Belcher) called upon him in order to see if he might safely advance money to the contractors. A summons was then taken out before the judge for an injunction to prevent the arbitration proceeding, and this was granted, and at the same time the submission to arbitration was revoked. Mr. Neville submitted that the action against Mr. Simpson was launched for the purpose of bringing the case within the decision of *Baring* v. *Dowlton & Co.*, and so preventing the architect from acting as arbitrator. Mr. Bray, for the respondents, submitted that the action against Simpson was a bona-fide one, and that the order below should not be disturbed. Their Lordships held that there was no ground for removing the architect from his position as arbitrator, and reinstated him in his position. The appeal was accordingly allowed, with costs.

HOGARTH'S HOUSE, CHISWICK.

The Workmen's Compensation Act and the Demolition of Old Buildings.—In the Court of Appeal on Thursday last, the case of *Knight* v. *Cubitt & Co.* was heard. This was an appeal by the employers, Messrs. Cubitt & Co., from the decision of the judge of the Brompton County Court in an arbitration under the Workmen's Compensation Act, 1897. The applicant for compensation was the widow of a man who was killed in the course of his employment. Messrs. Cubitt & Co., who were builders, had entered into a contract with Messrs. Woolland to alter two houses, Nos. 16 and 17, William Street, Knightsbridge, and for this purpose No. 17 had to be demolished and rebuilt. Messrs. Cubitt & Co. entered into a sub-contract with one Clements, called a housebreaker, whereby the latter undertook the demolition of the house. The deceased man was in the employment of Clements, and while he was employed on the demolition of the building he was killed by an accident. The building was originally over 30ft. in height, but at the time of the accident had been reduced to about 11ft. in height. The party-wall between Nos. 16 and 17, however, remained standing, and it exceeded 30ft. in height. The county court judge made an award in favour of the applicant for £273. It was contended first that the work of demolition was merely ancillary to, and was no part of or process in, the trade or business carried on by Messrs. Cubitt & Co. within the exception in section 4 of the Workmen's Compensation Act, 1897. Secondly, the employment at the time of the accident was not on a building exceeding 30ft. in height; and thirdly, Messrs. Cubitt & Co. were not "undertakers" within the meaning of the Act. The Court dismissed the appeal. The Master of the Rolls said that with regard to the question whether the building exceeded 30ft. in height there was a finding of the county court judge that the building was over 30ft. in height at the time of the accident. His Lordship did not impugn anything decided in *Billings* v. *Holloway* (1899, 1 Q.B., 70). The finding in the present case stood quite independent of that case. All the Court had to do was to see if there was any evidence upon which the judge might reasonably find that the building exceeded 30ft. in height. The evidence showed that the workman was at the time of the accident employed on a building, a substantial part of which, namely, the party-wall, was over 30ft. in height. Therefore, there was evidence to support the finding. Upon that point the appeal failed. With regard to the other points raised, the evidence showed that it was part of Messrs. Cubitt & Co.'s business to demolish buildings, though for their own convenience they did not actually do the work of demolition themselves, but employed a skilled man, called a housebreaker, to do it. They contracted to demolish this building and to reconstruct it. They undertook both obligations, and that was their usual course of business. Therefore, upon the facts, there was nothing to exclude Messrs. Cubitt & Co. from the position of "undertakers." This particular question arose under section 4 of the Act, that section dealing with undertakers who *ex hypothesi* had deputed to another the carrying out of something which they themselves had contracted to do. The Lords Justices delivered judgment to the same effect.

Workmen's Compensation: Another Important Appeal Case.—The workmen's compensation case of *Christopher McGrath* v. *Robert Neill & Sons* came before the Court of Appeal on Friday last. The appeal was from the Manchester County Court. The question was, in measuring the height of a building for the purpose of deciding the claim to compensation, should the measurement be taken from the street level, the basement level, or the footing below the soil. The top of the walls of the warehouse which Messrs. R. Neill & Sons were building measured at the time of the accident, from the bottom of the footing, exactly 33ft. 2½in.; from the top of the footing, 31ft. 2½in.; from the basement floor, 29ft. 10in.; and from the level of the street, 23ft. 5¾in. If the two last measurements were taken, the statutory height would not have been reached, and Messrs. Neill & Sons appealed on the ground that the standard of measurement should be taken either from the basement floor or the level of the street. The Court dismissed the appeal. In their opinion there was evidence that the warehouse was a building exceeding 30ft. The learned county court judge had measured the height from the bottom of the footing; and while they did not decide the point, for it was unnecessary to do so here, they intimated that for the purposes of the Act they saw no reason why the measurement might not be taken to commence even from the level of the foundations of the building.

Hogarth's House, Chiswick, is to be offered for sale at the Mart on November 25th. A scheme is on foot to purchase it and turn it into a museum of relics of the great painter. The accompanying illustration is therefore of much topical interest.

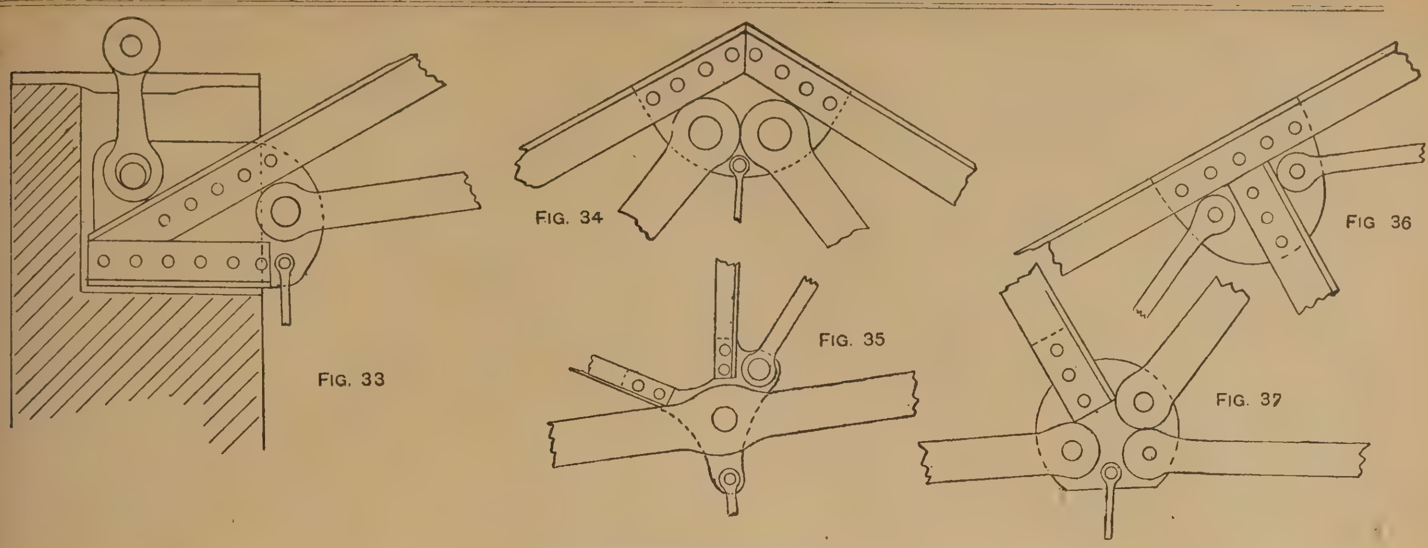


FIG. 33

FIG. 34

FIG. 35

FIG 36

FIG. 37

DETAILS OF ROOF TRUSS (FIG. 32).

BUILDING CONSTRUCTION.

(*Continued from p.* 221, *No.* 352.)

Beams.

29. IN text-books of mechanics tables of beams under various modes of loading are usually given. Some books give six different modes and some give twelve. We shall consider these different cases later. In all of these modes of loading the loads are supposed to give no self-support. In practice, however, the self supporting value of the loads is often of very great importance, and it would be very inconvenient to extend the table to include them all. If a student proposes to depend upon his memory for the formulæ in connection with these different beams and loads, I strongly advise him against such a course. For the comparatively rough-and-ready purposes of practice, it is not necessary to follow too closely the refined physical and mathematical investigations which have connected themselves with this subject, and which are exceedingly interesting and valuable; and the student will find it profitable and pleasant to consider the subject of beams in a general form.

30. Consider a portion of a Warren girder to the left of a line $\alpha\beta$ in equilibrium under the forces figured and the stresses at $\alpha\beta$ (Fig. 38). The diagram of stresses shows that the stress in jk is a compression of 2,910lbs., and that the stress at β is compounded of the stress 2,525lb. in ai and the stress 825lbs. in ij. If we increase the number of bracings (Fig. 39) we get the same stress in the member of the upper cord next α, and a little more in the member of the lower cord next β; and if we divide the *distributed load* on the top of the girder still more, we can make the stresses in the top and bottom cords as nearly equal as ever we please, and the stress in the member of the bracing next $\alpha\beta$ ultimately becomes (1000 – 300) lbs. It will be observed that the average stresses on the bracings remain nearly the same, however many there are of them, and that they are alternately + and –, compression and tension. If we make them very numerous we shall add to the weight of the girder without increasing its strength in any way, and, further, the limit will soon be reached at which it is no longer possible to mechanically construct the girder – there will not be room for the joints. We may, however, imagine the bracing members increased till they stand in contact from cord to cord, and that when this limit is reached any slight straining motion will cause the tension members to rub against the compression members. Go a step further: suppose the joints between each tension member and compression member to be made fast with some cementing material, the stresses in the bars neutralise each other, but there is a stress of a peculiar kind put upon the cementing material which now prevents the bars from *sliding against* one another; it is now a very slight further step to take to imagine the cementing material and the material of the bars to be the same, and we have the condition of a flange girder, where the top flange is the top cord, the bottom flange the bottom cord, and the web is the adhering bracing. The stress upon the assumed cementing material is the *shearing stress* or *shear*. The student will see that this is the kind of stress put upon the neck of a rivet in the plating of a boiler and on the shanks of bolts and rivets in analogous positions; he will understand what is meant when it is said that the *web takes the shear*. As a matter of fact, in an ordinary **I** rolled joist the flanges also take some of the shear, as the student ought easily to see from what I have said above.

31. Replace the girder, Fig. 39, with the rolled joist (**I** section), Fig. 41. It has been seen that the shear at $\alpha\beta = 700$lbs.; and if we assure ourselves that the *section* is sufficiently strong to bear this stress, we need not further trouble about it. The stresses in the flanges may be found by a diagram (Fig. 40) for which any kind of bracing is assumed—gathering the load to the apices: it will be the stress corresponding to the line J K (Fig. 38). But the simplest plan is to take moments about the point β

$$1000 \times 5 - 300 \times \frac{5}{2} = \text{the moment about } \beta;$$

this is the *bending moment* of the beam at the section $\alpha\beta$ Divide this by the depth of the beam for the compression stress on the top flange; the tension stress on the bottom flange is equal to it. It is commonly assumed that the bending moment is resisted by the moment of the couple formed by the stresses in the flanges and having for arm the line joining the centres

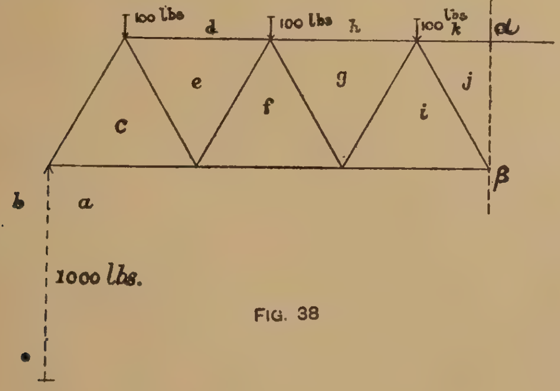


FIG. 38

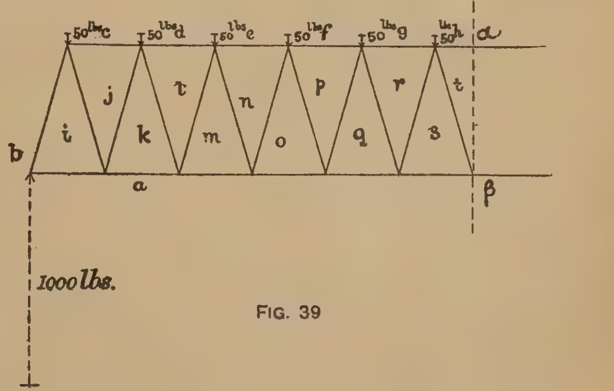
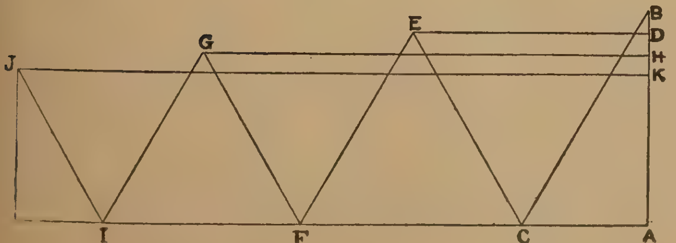
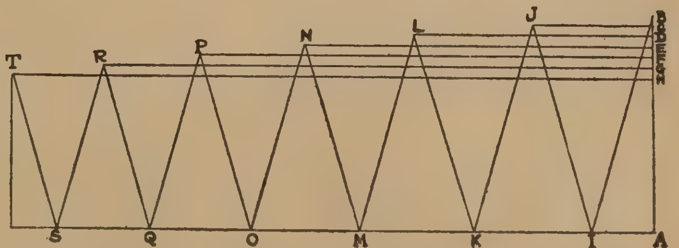


FIG. 39





of gravity of the cross-sections of the flanges; just as we have seen that the flanges take some of the shear, the web also takes some of the bending moment.

32. The portion of girder shown in Fig. 41 may be a part of a girder loaded uniformly and supported at the two ends, like that of Fig. 42, carrying a uniformly-distributed load of 2,000 lbs. It may be inferred from Fig. 38 that as the cross-section $\alpha\ \beta$ is taken nearer the middle of the girder the bending moment gets greater, and it is a maximum at the centre of the girder; on the other hand, the shear gets less and less and it becomes nought at the middle point of the length of the girder. Examine the stress diagram: the horizontal lines are separated by the equal distances B D, D H, &c., but the differences between E D, G H, J K, &c., are not equal, and consequently the line joining B E G J, &c., is not a straight line; it will be found that a curve will fit these points, and that it is a curve of a known kind. It is a parabola having for its axis O A (Fig. 40) where O A is the maximum horizontal stress on either side of the *neutral axis* at the centre of the girder, and having for its ordinate at A, A B the maximum shear which is at the point of support. This is a very useful form; the girder being of uniform depth, the bending moments are proportional to these stresses. If the ordinate B A be taken to represent half of the girder, a horizontal line from any point to meet the curve gives the stress in a flange at that point; the ordinate from this point to O A gives the shear at the point, and the bending moment is given by multiplying by the effective depth of the girder.

In the case of rolled joists there is no great use for this curve, because the joist is rolled of uniform cross-section, and we have simply to see that the section is sufficient for the maximum bending moment and for the maximum shear.

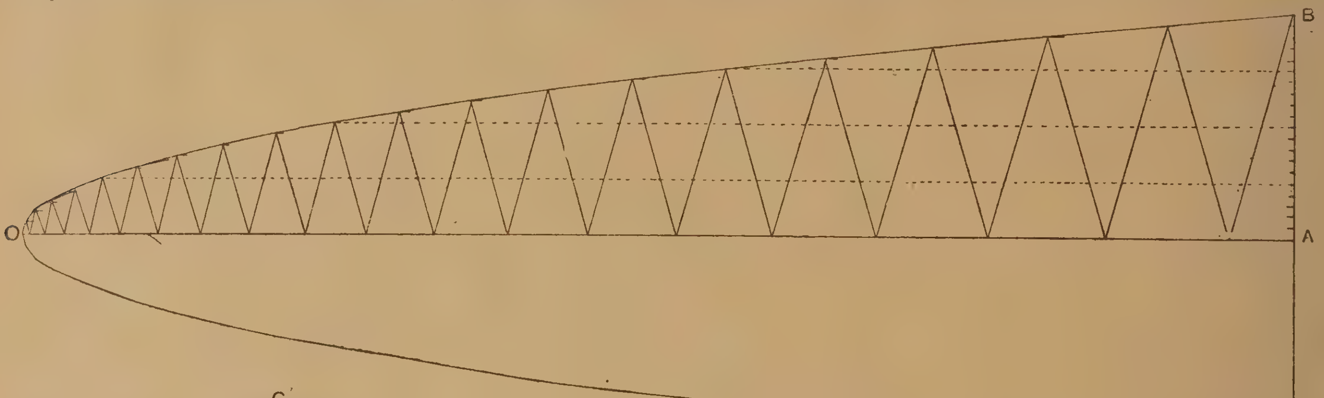


FIG. 40

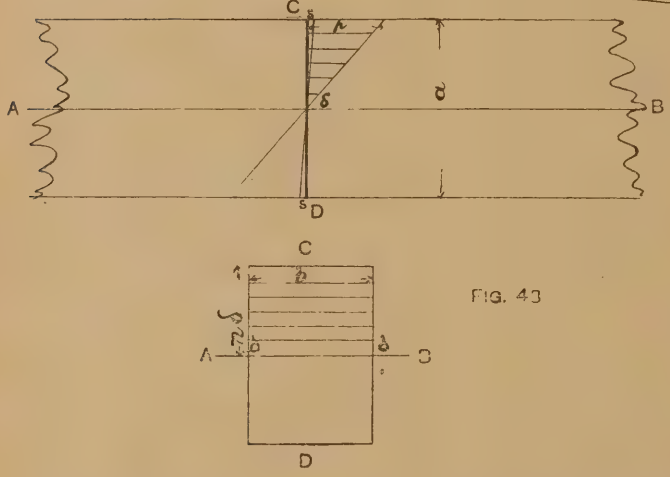


FIG. 43

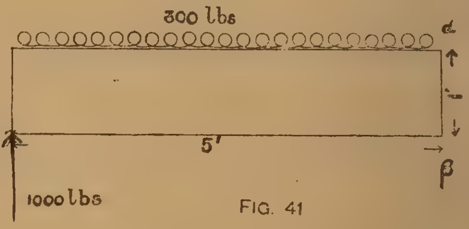


FIG. 41

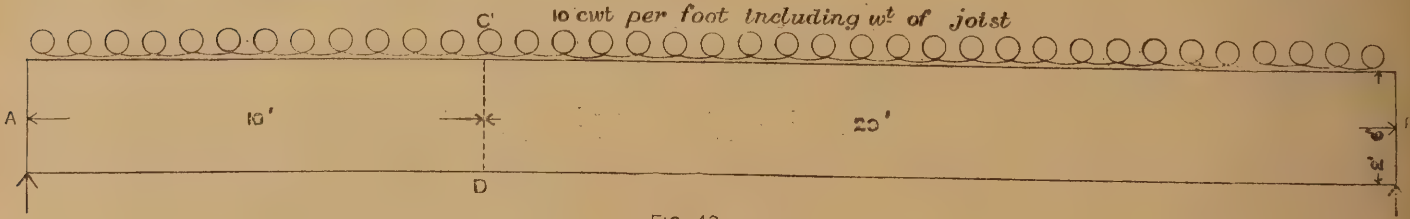


FIG 42

There, is therefore, a good deal more material in a rolled joist than would satisfy calculation, but the cost of distributing the material in an "orthodox" manner would amount to very much more than the price of the extra material. About fifty years ago people had faith in the reliability of cast-iron girders, and in designing them it was of importance to pay attention to the varying bending moment and the varying shear. It is still of importance in designing heavy box or built girders. In designing lattice girders it is good to have in mind the results of this investigation, but the proportions of the members of such structures are given by stress diagrams drawn for each special case.

To make a practical application: find *a* the bending moment, *b* the stress in the flanges, and *e* the shear at the section C D in Fig. 42. Reaction of support at A = 150 cwt., its moment about D = 1,500ft. cwt. (1). Moment of load $\frac{10 \times 10 \times 10}{2} = 500$ft. cwt. (2).

(2) is in opposition to (1) ∴ bending moment = 1 500 500 = 1,000ft. cwt. If we take the effective depth of the beam to be 2·5ft., the stress is $\frac{1000}{2 \cdot 5} = 400$ cwt. = 20 tons. Shear = 150 – 100 = 50 cwt. = $2\frac{1}{2}$ tons.

33. Any other case in beams will be easier than the above. The bending moment, as we have seen, is greatest at the middle. The question of shear, as shown, is a small one; but we meet the difficulty here which we have met in other forms before—it is the difficulty of long struts. In most cases, if the web is proportioned only with regard to the shear it will buckle sidewise, and it must be made thick enough to prevent this. In built continuous-webbed girders the web is stiffened by angles or tees riveted to the web at intervals, and these also support the outer edges of the flanges. This is an economical plan by which the girder becomes a composite one, because these stiffeners are really compression members of bracing. In the case of "rolled joists" they may also be stiffened in this way, but it is found advisable to have their web thick enough to be safe without this stiffening. The question of cost comes into every practical design, and it is found more economical to use rolled joists of uniform section for moderate spans, having extra thick webs than to attempt to graduate the section and stiffen the webs. As I have previously pointed out, there is a distinction between economy in cost and economy of material. In the case of bridging wide spans with a given material, economy of material is necessary to reduce the load on the structure, and this economy of material can only be attained by increased workmanship and increased ultimate expense.

34. To revert to Fig. 42, the bending moment at the centre is

$$150 \times 15 - 150 \times \frac{15}{2} = 1,125\text{ft. cwt.}$$

If we take 2·5ft. to be the distance between the centres of gravity of the cross-sections of the flanges the stress in each flange may be taken to be $\frac{1125}{2 \cdot 5 \times 20} = 22 \cdot 5$ tons, and at 4 tons per sq. in. we must have a flange cross-sectional area of 5·625in., or, say, 6 sq. in.: this calculation will do for all practical purposes. The depth assumed is too great for a rolled joist, and the student may take it to be a continuous-webbed riveted girder.

It may be asked, having regard to the extra thickness of the web to prevent buckling or folding, why not make the flanges heavy and the depth less? The answer to this question is that *stiffness* is a matter of great importance, and it must be taken account of in designing the girder: great stiffness is most easily attained by increasing the depth. The *deflection* of beams will be dealt with later.

35. Let the student have a clear idea of what is meant by *bending moment.* When represented by a number it is the product of the amount of a force in definite units and a distance in known units: we may speak of a bending moment in ft. lbs., ft. tons, &c. If we consider a portion of a beam as a rigid body in equilibrium under two couples, one of which is equal to the sum of the various couples arising from external forces applied at right angles to the axis of the portion of beam in one plane, and the other the equal couple made up of the sum of the couples between the two faces of the section separating the portion of beam or girder from the remaining part, either of these couples is the bending moment at the section.

Up to the present I have said nothing of *moment of inertia* and nothing of *Young's modulus* in connection with beams. The term *moment of inertia* is borrowed from another department of mechanics. We speak of the moment of inertia of an area about a line in its plane, and we speak of the centre of gravity of a plane figure. I have said that, though I assumed that the bending moment is at a section of a girder balanced by the moment of the equal and opposite pulls in the flanges, the web has some value in resisting the bending moment. If we divide the area of the cross-section into a large number of small areas, the stress in each little section, multiplied by its distance from a line called the neutral axis, is the moment of the stress about the axis; the neutral axis is such that the sum of all the moments to one side of it is equal to the sum of all the moments to the other side, but the stress in each small area, supposing the areas to be equal, is proportional to its distance from the neutral axis. So that if p be the stress per unit of area at a point at unit distance from the neutral axis, then the moment of any small portion will be $p\,d^2\,a$, where d is the distance from the neutral axis and a is the area of the portion of cross-section: and the sum of all such moments will be $p\,a\,(d_1^2 + d_2^2 + d_3^2 + \&c.)$.

The expression $a\,(d_1^2 + d_2^2 + d_3^2 + \&c.)$ is called the *moment of inertia* of the section about the axis.

36. I shall take a definite example. Consider the bending moment at the cross-section C D of a rectangular timber beam, shown at Fig. 43 in side elevation and in cross-section. The bending moment is balanced by the sum of all the moments of the stresses in the small rectangles —whose length is b and the breadth of each δ— about the *neutral axis* A B. The length p represents the stress per unit of area at the outer fibres of the beam. It is assumed that the beam is homogeneous, and that at every part *stress* and *strain* bear the same proportion; that the cross-section C D when strained will still be a plane, and that it will take the position shown by the line *s s*. We shall take the small length *s* to represent the strain of the outer fibres. The half depth of the beam is $n\,\delta$. The stress per unit of area along the line $\delta\,\delta$ is $\frac{p}{n}$; and because the breadth b is very small the line $\delta\,\delta$ may represent it, and it may be made to lie as close to A B as ever we please by taking n large enough: its moment is therefore $\frac{p}{n}\,l\,\delta^2$ ($l\,\delta$ being the area)

$$\text{The stress in first line} = \frac{p}{n}\,l\delta$$

$$\text{,, ,, ,, second ,,} = 2\frac{p}{n}\,l\delta$$

$$\text{,, ,, ,, third ,,} = 3\frac{p}{n}\,l\delta$$

and so on.

$$\text{The moment of stress in first line} = \frac{p}{n}\,l\delta^2$$

$$\text{,, ,, ,, ,, ,, second ,,} = 2\frac{p}{n}\,l\delta\,2\delta$$

$$\text{,, ,, ,, ,, ,, third ,,} = 3\frac{p}{n}\,l\delta\,3\delta$$

and so on.

The sum of the moments therefore

$$= \frac{p}{n}\,l\delta^2\,(1 + 2^2 + 3^2 + 4^2 + \&c. + n^2) \quad . \ . \ . \ (1.)$$

The sum—

$$1 + 2^2 + 3^2 + 4^2 + \&c. + n^2 = \frac{n\,(n+1)\,(2n+1)}{6}$$

We take twice this quantity for the moments both sides of the neutral axis.

$$\text{Bending moment} = 2\,\frac{pb\,(n+1)\delta\,(2n+1\,\delta}{6}$$

Now consider $(n\delta + \delta)$ and $(2n\delta + \delta)$. When n is taken very large (remembering that $n\delta = \frac{a}{2}$) δ is very small; and by taking n large enough δ may be made smaller than any quantity that can be named $\therefore\ n\,\delta + \delta$ is in the limit $\frac{a}{2}$ and $2n\delta + \delta$ is a.

$$\therefore \text{Bending moment} = \frac{pba^2}{6} \quad . \ . \ . \ (2.)$$

We arrive at this result by a straightforward investigation which involves only very elementary algebra; and if *moment of inertia* had not been named, it would not suggest itself, but we can pick out *moment of inertia* from (1).

$l\delta$ is the elemental area and $\delta^2 + (2\delta)^2 + (3\delta)^2 + \&c.$ is the sum of the squares of the distances $= 2l\delta^3\,\frac{n\,(n+1)\,(2n+1)}{6}$

$= \frac{4b\,(n\delta)^3}{6} = \frac{ba^3}{12}$ is the *moment of inertia* of the rectangular section about A B. There is utility in bringing *moment of inertia* into the calculation, because this quantity is tabulated for various cross-sections, and it is a convenient quantity to deal with mathematically. It is convenient to represent moment of inertia by the letter I. If we revert to (2), we can put it in the form $\frac{pba^2}{6} = 2\,\frac{p}{a} \cdot \frac{ba^3}{12} = 2\,\frac{p}{a}\,\text{I}$.

We have now a very simple form of expression for the conditions which must be fulfilled by the material and dimensions of a cross-section to withstand any given bending moment when we know the moment of inertia of the cross-section about its neutral axis.

(*To be continued.*)

Surveying and Sanitary Notes.

Lady Sanitary Inspectors.—The Southwark Borough Council has just received from the Local Government Board a notification of sanction to the appointment of Miss M. W. Richardson and Miss F. M. Nicholas as sanitary inspectors to the Council. The Public Health and Sanitary Committee in a report to the Council intimate that they have appointed Miss Ethel Stewart, of Manchester, as a third female sanitary inspector.

Breaking-up the Streets.—On Tuesday, October 8th, the borough of Chelsea completed laying the roadway in Draycott Place with wood. On Tuesday, the 15th, the Chelsea Electricity Supply Company took up the newly-laid wood in order to place a main across the street. When this was done the wood was replaced and traffic resumed. Now the work done by the Electricity Supply Company is undone by the borough of Chelsea, as the paving must be permanently fixed by their own men. Both authorities say the blame lies with the other.

A Park for Romford.—Mr. H. H. Raphael, J.P., hearing that the Romford Urban Council had under consideration the construction of an electric tramway, has offered to give the lake at Gidea Hall Park, and part of the park, to the Council as the nucleus of a public park; for an electric tramway would of course enhance the value of his property, and he considers it a monstrous thing, when the value of property is largely increased by the expenditure of the community, that the whole of the increased value should go into the pockets of the landowner without any contribution from him. The approximate areas of land and water proposed to be given are: land, fourteen acres; water, six acres.

Piccadilly Widening.—The Improvements Committee of the London County Council, which is in charge of the scheme for widening Piccadilly, has not yet prepared a final report for the Council, but it is understood that certain modifications of the original plan have been suggested by the Office of Works, and that these are now under consideration. It is believed that the Office of Works only throws out the suggestions tentatively, reserving its final decision until it learns the committee's views. The suggested alterations would confine the widening scheme to the extreme western corner of Green Park, where the congestion of traffic in front of Hamilton Place is generally admitted to cause a great deal of inconvenience. The original plan was to throw into the roadway a strip of the park for its full length of nearly half a mile in Piccadilly.

Keystones.

A New Church at Chertsey has been erected at a cost of over £5,000.

A New Central Free Library at Hull, costing £20,000, has been erected.

Mr. William Skiller, architect, of Hastings, committed suicide recently at the age of sixty-one or sixty-two years.

Mr. Silvanus Trevail, F.R.I.B.A., J.P., Pres.S.A., has been returned at the head of the poll for the seventh time by the electors of the Eastern Ward of the city of Truro.

The R.I.B.A. Kalendar for 1901-2 has just been issued. It contains the usual information about all matters connected with the Institute, including the questions set in the examinations held last June.

A New Wesleyan Church at Cliffe of simple Gothic design is being erected by Messrs. George Gates & Son, of Frindsbury, from designs of Messrs. J. W. Nash & Son, of Rochester. It will afford accommodation for a congregation of 300, and the inclusive cost will be about £1,300.

The Queen Victoria Memorial Hall at Kensington Place, Notting Hill Gate, was opened recently, and completes the first part of a scheme which is being carried out under the patronage of the Princess Louise to erect an institute to ameliorate the condition of the poorer parishioners of St. George's Campden Hill. The architect was Mr. W. B. Medlicott.

A New Church at Carlin How, Brotton, has been erected. It is a brick structure in the Norman style, of cruciform design, and consists of a nave with two bays, together with a chancel. Messrs. Hickes & Charleswood, of Newcastle, were the architects, and Messrs. Cruddas & Sons, of Guisborough, the builders. The total cost of the church and furnishings is £2,300.

An Oak Chancel Screen with Rood Cross has been erected in the parish church, Whitchurch, Hants, in memory of Queen Victoria. It is from the design of Mr. Walter E. Hewitt, A.R.I.B.A., of 22, Buckingham Street, Strand, W.C., and was carried out by Mr. N. Hitch, of 60, Harleyford Road, Vauxhall. The cost, including the necessary moving of the stone pulpit, was about £100.

St. Saviour's Chapter-House was opened recently. The building which has been acquired for the purposes of the chapter was originally the chapel of St. Thomas the Martyr, which was founded in 1213. It is situated in St. Thomas Street, Southwark, in the neighbourhood of Guy's Hospital. Since the building has been taken over by St. Saviour's it has undergone several alterations, and has been thoroughly cleaned and re-decorated. A feature of the house is a fine old oak gallery which runs round the northern and western walls. The reredos and communion table, also of oak, have been allowed to remain, and the old chapel seats have been broken up and utilized for the purpose of panelling the walls. Mr. Arthur Bartlett was the architect for the work.

The Edinburgh Architectural Association now comprises fellows, members and associates. The associates' section is to have a series of meetings and papers of its own, and has appointed the following office-bearers: Chairman, Mr. J. Stuart Syme; vice-chairman, Mr. J. F. Matthew; hon. secretary, Mr. J. McIntyre; committee, Messrs. J. Sidey, D. Davidson, Hay Lamont, J. Jerdan, B. S. Murphy and J. A. Arnot. Last week the formal opening of the new rooms, No. 117, George Street, Edinburgh, took place, when the president and office-bearers held a reception, at which about 250 ladies and gentlemen attended. Sir George Reid, president of the Royal Scottish Academy, declared the rooms open, and Bailie W. S. Brown, as representing the city, and Professor Baldwin Brown, as representing the University, addressed the gathering.

At Crewe Cottage Hospital a children's ward has been opened as a memorial to Queen Victoria.

£4,000,000 for Housing.—The housing schemes now in hand or about to be undertaken by the London County Council will involve an expenditure of nearly four millions. Soon the Council will possess 250 blocks of workmen's dwellings, accommodating 92,000 people and yielding an annual rent of £161,000.

At the Church of St. Mary, Leith Woods, a reredos has been added of alabaster, with the outlines of the design gilded. It comprises nine panels. The super-altar and panelling each side of the altar are of fumigated oak. The sculptors are Messrs. Flint Brothers; the gilders, Messrs. W. O. C. Powell; and the architect is Mr. G. F. Bodley, A.R.A.

The Glasgow Architecture Association held a meeting on Tuesday, November 5th, the president (Mr. Charles E. Whitelaw) in the chair. An interesting member's paper, by Mr. James Salmon, was read on "Voices in Stones, or the Language of Architecture." A discussion followed, opened by Mr. Alexander McGibbon, A.R.I.B.A.

A New Reredos at St. Martin's Church, Caerphilly, is to be erected to perpetuate the memory of the late Rev. Thomas Jenkins, who was for twenty-eight years the rector of the parish. The design has been prepared by Mr. George E. Halliday, architect, Cardiff. The reredos will be constructed of pink polished alabaster, with Irish green marble shafts and gold mosaic behind three figures in the panels. The cost of the work is estimated at £250.

The new Church of the Ascension at Stirchley, King's Norton, was opened recently. Mr. W. Hale was the architect. The church is in Late Decorated style of Gothic, the walls being of red bricks, with outer dressings of terra-cotta. The internal piers, arches and dressings are in selected Farleigh Down Bath stone, and accommodation is provided for 578 adults. The nave is 82ft. long by 35ft. wide, with north and south ambulatory aisles, each having five bold but low arches from the nave. The chancel is 32ft. 6in. by 22ft., and on the south side are the clergy and choir vestries, the latter of which is carried up as a tower, in which are the organ-chamber, ringing loft, and belfry with provision for eight bells. The cost has been £8,400.

The Liverpool Victoria Memorial.—The committee having the Liverpool memorial in charge met recently at the Liverpool Town Hall and decided upon the awards for designs for the memorial. A considerable number had been received. The first premium (£100) was awarded to Mr. R. Lindsay Clarke, sculptor, Cheltenham, associated with Mr. R. A. Briggs, F.R.I.B.A., of London. The second premium of £75 was awarded to Mr. C. J. Allen, sculptor, of Liverpool, and Messrs. Simpson, Willink & Thicknesse, architects, of Liverpool; and the third premium of £50 to Mr. H. C. Fehr, of South Kensington, associated with Mr. J. S. Gibson, architect. The successful competitors have been asked to submit models to enable the committee to arrive at a decision. Meantime the committee will not make public the designs.

At Charing Cross Hospital the basement has been reconstructed. A large kitchen, with the newest and most efficient apparatus for cooking by gas and steam, has been provided. In addition to the kitchen a scullery, two new larders, and two new store-rooms and a commodious servants'-hall have been constructed, to which must be added a workshop for the engineering department adjoining the new boiler-house. The accommodation thus provided will serve for the whole hospital when it is completed. The cost of these improvements, including the new boilers and the new sanitary annexe to the wards of the south wing of the hospital, amounted to £12,000. For the construction of the new buildings, which comprise a new and vastly improved out-patient and casualty department, a suitable home for the nursing staff, quarters for the resident medical and surgical staff, isolation wards and wards for special diseases, the tender of Messrs. Holloway Brothers for £82,730 has been accepted; but at least £100,000 will be required before the new Charing Cross Hospital will be completed.

The Glasgow International Exhibition closed on Saturday last.

A New Mace for Honiton Corporation, of jet black ebony, highly polished and mounted with silver, 2½ft. long, the orb being 4in. in diameter, has been made by Messrs. Harry Hems & Sons, of Exeter. It has been designed by Mr. William Ward, the borough surveyor.

"Views and Reviews."—Two printers' errors crept into the review of Mitchell's "Advanced Building Construction," published in our last issue. In line 28 from the bottom of the third column on p. 217, $CaSO.2H_2O$ should read $CaSO_4.2H_2O$, and in line 10 from the top of the middle column on p. 218 "hydrated oxide of hydroxide or iron" should read "hydrated oxide or hydroxide of iron."

The Passmore Edwards Limehouse District Public Library, at 638, Commercial Road, E., was opened recently. The newsroom is 27ft. by 38ft., and is capable of holding about seventy persons. The lending-room is on the ground floor. The reference-room has seating accommodation for about eighty readers. The cost of the building and fittings will be about £10,000. The architects were Messrs. Clarkson, and the contractors Messrs. Sabey & Son. The building is in red bricks and stone in Renaissance style.

A Manchester Competition.—The Watch Committee of the Manchester City Council have awarded the premiums for competitive plans for the erection of the proposed new fire-station as follows: First premium, £300, Messrs. Woodhouse & Willoughby and Mr. John Langham, of Manchester (joint plans); second premium, £200, Mr. George Mackie Watson, Edinburgh; third premium, £100, Messrs. Magnall & Littlewood, Spring Gardens, Manchester. The new building is to be erected in London Road, on the triangular plot of land at the junction of Whitworth Street. It is estimated that the total cost, including land, will be over £100,000.

The Royal Institute of the Architects of Ireland held a general meeting last week. The chair was taken by the president, Sir Thomas Drew, P.R.H.A., F.R.I.B.A. The ballot papers for the election of a president for the next three years were opened and examined, and the chairman announced that Mr. George C. Ashlin, R.H.A., F.R.I.B.A., was duly elected. The following were then elected members of the Institute: Mr. John Barrett Robinson, Belfast; Mr. William Blackwood Blackwood, Belfast; Mr. Frederick Shaw, Drogheda; Mr. Percy Morgan Jury, Belfast. Some slight alterations in the by-laws of the Ulster Society of Architects, which is affiliated with the Institute, were considered and approved of.

Mr. John Campbell died recently at the age of seventy-five years. He who went out to Bombay shortly after the Mutiny and joined a firm of architects, under whose direction the Elphinstone Circle, the Victoria and Albert Museum at Byculla, and the dam of Tulsi Lake (one of the sources of the Bombay water-supply) were constructed. Later, he became senior partner of another firm, and from plans prepared by him a number of the prominent buildings in the city were built. He also carried out some important irrigation works in Southern India Before settling in Bombay Mr. Campbell went out to the Crimea as assistant to a firm of contractors, and was present at the fall of Sebastopol.

Enclosure of Stonehenge.—The Executive Committee of the Commons and Footpaths Preservation Society has obtained eminent legal advice as to the recent enclosure of Stonehenge. It appeared that several clearly-defined tracks leading to the monument had been obstructed by the erection of a barbed-wire fence, and the Society was advised that, prima facie, there was a strong case for the existence of public rights of way over these tracks. The Committee resolved to petition the local authorities to protect the public rights involved, and letters from eminent archæologists were read protesting against the enclosure of Stonehenge on the ground that the character of the monument had been entirely altered by the existence of a high barbed-wire fence in close proximity to the remains. It was further pointed out that the stones could be amply protected from injury without enclosure by means of the Ancient Monuments Protection Acts.

Mr. William Henry Read, architect and surveyor, of Bristol, died recently at the age of fifty-one years. He was the only son of the late Mr. William Read, surveyor, of Swindon.

Mr. Edward Wickens Fry, of St. Martin's Terrace, Canterbury, died last week. Deceased, who was born in 1836, had for many years carried on the profession of architect and surveyor in Dover, and practically up to the time of his illness he was engaged in the working out of plans for new hotels in Dover.

Weybridge National Schools.—The rector and managers have accepted the plans prepared by Mr. A. H. Ryan-Tenison, A.R.I.B.A., 12, Little College Street, Westminster, for the re-modelling and enlarging of the infants' and girls' schools, together with a new residence for the master of the boys' school. It is hoped to proceed with the work shortly. The present buildings are the work of the late Mr. Pearson, R.A.

York Architectural Society.—The members of this society held their first meeting on Thursday last. In the course of his inaugural address the newly-elected president, Mr. C. H. Channon, F.R.I.B.A., remarked that the stigma attaching to the Institute that it was "Metropolitan only" did not now apply to it, for it had attained a national character and influence, and its work was each year increasing in importance.

The Kaiser and the Fountains.—In the matter of the fairy-tale fountain the Kaiser has scored a victory. The committee which met to consider the question whether it would be consistent with maintaining the general plan of the fountains as sketched by the city architect to follow the Kaiser's suggestions, have now decided that it is possible to unite the city architect's plan with the Kaiser's conception of what fairy-tale fountains should be.

A New Passmore Edwards Public Library at Bow has been opened in Roman Road. Mr. S. B. Russell was the architect. The magazine, room seats between sixty and seventy readers and the small front room has accommodation for about twenty-four. In the basement is the newsroom, with thirty-six newspaper-stands. In the front of the building is the lending library. On the upper floor is accommodation for the librarian. The cost was £6,000.

Trade and Craft.

Ventilating and Heating Appliances.

In the Machinery Hall at the Glasgow Exhibition Messrs. James Keith & Blackman Co., Ltd., of 27, Farringdon Avenue and 59, Farringdon Street, London, E.C., exhibited a number of appliances for heating and ventilating; and, in addition, their appliances were in evidence in the restaurants throughout the Exhibition, in the grounds, and in connection with the ventilation of the steam-pipe trenches under the Machinery Hall itself. A prominent feature of the firm's exhibit was a kiosk enclosing a fairy fountain and having four electric Blackman fans at the top. Suspended from overhead were four high-pressure gas lanterns of 1,000 candle-power each, which owed their brilliancy to a Keith automatic gas-compressor shown working from the city water service (this compressor was similar to those used for lighting the grounds). "Aiolian" and other radiators were exhibited, as well as a number of boilers. Keith's "Challenge" hot-water boiler is formed of sections placed one on another, with machined joints; 50,000 of these boilers are in use in different parts of the world. About the middle of the stand was a huge Blackman fan (96in. effective diameter), and further on a complete Keith "Python" sectional boiler, which had about 1,000 sq. ft. of effective heating-surface and was capable with easy firing of warming nearly five miles of 4in. hot-water pipe, or its equivalent in sq. ft. of radiator surface. Hydraulic rams, Keith's open-fire hot-water apparatus, a complete drying plant, and various forms of the company's valves and fittings for steam- and hot-water heating were also included in the exhibit. Whilst referring to this firm it is opportune to note that they are considering a suggestion to reduce the hours of labour at their works in the Holloway Road. The forty-eight hours' week has already been introduced at their works at Arbroath.

Door and Window Fittings.

The increasing practice of issuing catalogues in handy book form is a most commendable one, chiefly because it makes reference so much easier. This is apparent in the new catalogue of specialities just issued by Mr. Robert Adams, of 65 and 67, Newington Causeway, London, S.E. It contains, in addition to inventions which have been approved by the tests of many years, some newer patterns in door-springs, fanlight gear, &c., to the design of which much attention has been devoted. A number of excellent door springs are shown in the catalogue. The special advantages of the double-action "Crown" and "Cushion" patterns for swing and rebated doors are that they open and close 45 degs. beyond the right angles, while the single-action "London" and "City" patterns open and close from the angle of 180 degs., *i.e.*, the half circle; moreover, the internal spring is large and easily regulated, and the whole fitting is very compact. Other varieties are provided for exposed positions and for doors of all kinds, one being specially intended for swing-doors situated immediately over a girder near the surface, a most useful spring. Then there are numerous pneumatic door-springs shown in the catalogue—such as the "Empress Victor," the "Combination" silent check and adjuster, the "Norton" and the "Eclipse"—while further on are illustrated various forms of patent hinges and fastenings for gates and doors. The section devoted to fanlight gear is most comprehensive. The self-sustaining "Link-Motion" patent fanlight has vertical screw rod and regulator action, and is recommended for all ordinary fanlights; it is largely used in Government buildings, Board schools, banks, offices and private residences. Another variety is the "Double-Arm" screw-opener, which fits between two fanlights and operates them simultaneously. The "New Century" opener is practically noiseless, and closes the fanlight with great rapidity, holding it automatically fastened at any point. The "Caledonia" pattern is intended for sashes hung at the bottom and opening inwards, while the "Twin-Screw" pattern can be applied to these fanlights or to those top hung, side hung or centre pivoted. Many other varieties are shown, including the "Glide" patent concealed opener and the patent "falling link" rack-wheel, and the selection should be sufficient to satisfy every requirement. Systems of patent opening and closing gear for fanlights and sashes in lanterns, conservatories, &c., are also extensively dealt with, the remainder of the catalogue being devoted to patent reversible and safety window fittings, panic and other bolts, casement stays and fasteners, sash-balances, fittings for sliding doors, and door furniture in general. The catalogue is altogether an excellent one, and a copy should be in the possession of all architects and builders.

CURRENT MARKET PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—
Clover, best	per load	4 15 0	5 10 0
Hay, best	do.	5 5 0	5 15 0
Sainfoin mixture	do.	4 10 0	5 5 0
Straw	do.	1 8 0	1 18 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French	per cwt.	1 7 0	1 8 7
Colza Oil, English	do.	1 7 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 7 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do	1 0 4½	—
Linseed Oil, barrels	do	1 13 3	—
Petroleum, American	per gal.	0 0 7	0 0 7¼
Do. Russian	do.	0 0 6½	0 0 6¾
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	5 18 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt	per cwt.	1 8 0	1 8 6
Tar, Stockholm	per barrel	1 4 6	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong	per ton	80 0 0	—
Iron, Staffs., bar	do.	6 10 0	8 10 0
Do. Galvanised Corrugated sheet	do.	11 15 0	—
Lead, pig, Soft Foreign	do.	11 5 0	11 7 6
Do. do. English common brands	do.	11 15 0	11 17 6
Do. sheet, English 3lb per sq. ft. and upwards	do.	14 0 0	—
Do. pipe	do.	14 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	6 15 0	—
Do. floor brads	do.	9 10 0	—
Steel, Staffs., Girders and Angles	per ton	6 0 0	6 5 0
Steel, Staffs., Mild bars	do.	6 15 0	7 5 0
Tin, Foreign	do.	114 0 0	114 10 0
Do. English ingots	do.	116 0 0	117 0 0
Zinc, sheets, Silesian	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	16 13 9	17 0 0

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load	3 0 0	4 0 0
Pine, Quebec, Yellow	do.	4 7 6	6 0 0
Do. Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P. Std.	9 10 0	10 15 0
Do. do. 4th & 3rd	do.	7 15 0	8 0 0
Do. do. unsorted	do.	5 12 6	6 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	14 0 0	—
Do. do. 2nd "	do.	12 10 0	—
Do. do. unsorted	do.	10 5 0	—
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	do.	13 15 0	16 15 0
Do. White Sea	do.	8 5 0	16 5 0
Do. Quebec Pine, 1st	do.	27 5 0	—
Do. do. 2nd	do.	12 15 0	13 0 0
Do. do. 3rd &c.	do.	9 10 0	—
Do. Canadian Spruce, 1st	do.	10 10 0	11 10 0

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

AYR.—For completing drainage scheme of the burgh of Ayr, for the Corporation: (Contract No. 9) construction for the southern division of the burgh of a new main sea outfall, and concentration and other sewers, requiring about 350 tons of 42in. diameter and 250 tons of 22in. diameter cast-iron pipes, 250 tons of cast-iron screw piles and special castings, 1¾ miles of brick and concrete sewers, and three miles of fireclay pipe sewers, from 20in. to 9in diameter, and other relative works; (10) construction in Wallacetown district of about 200 yards of brick and concrete sewer and two miles of fireclay pipe sewers, from 18in. to 9in. diameter, and other relative works. Mr. Eaglesham, C.E., engineer, Ayr:—

Contract No. 9.

H. Hastie, Monkton	£38,784 17 3
T. Crawford & Son, Strathaven	37,014 9 2
W. Clarke, Sandgate Street, Ayr	33,530 7 4
Blair & White,* 65 Bath Street, Glasgow	31,297 4 5

Contract No. 10.

T. Crawford & Son	£2,650 11 8
Blair & White	2,615 16 7
T. Christie, Stirling	2,520 10 0
MacKay & Co., 5 St. Andrews Square, Edinburgh	2,398 1 0
W. Clarke*	2,381 17 4

* Accepted.

BERKHAMPSTEAD.—For making-up Doctor's Commons Road, for the Urban District Council. Mr. E. H. Adey, surveyor:—

E. Free, Maidenhead	£1,325 0 0
Barry Contracting Co., Glamorgan & London	1,269 2 0
H. Willis, Harpenden	1,261 13 4
H. Brown, Watford	1,225 0 0
Felkin & Watson,* Southall	1,186 18 0

* Accepted. [Surveyor's estimate, £1,300.]

BIRMINGHAM.—For the erection of new laundry, for the Acock's Green and Olton Laundry, Ltd. Mr. Leonard H. Collier, architect, 71 Colmore Row, Birmingham:—

J. A. Turton	£2,351 10
W. Lee & Son	2,225 0
Stafford & Mansfield	2,115 0
J. Webb	2,069 0
A. J. Teal*	1,995 0
H. Allen	1,166 0

* Accepted conditionally.

BRYNMAWR (WALES).—For the erection of school at Brynmawr for 420 boys, and for converting the three departments of present schools into two departments, and executing various repairs at the Brynmawr Board Schools, for the Brynmawr School Board. Mr. F. Baldwin, architect, 13 Frogmore Street, Abergavenny:—

D. W. Davies, Cardiff	£6,517 0
D. Thomas & Son, Cardiff	6,420 0
T. S. Foster, Abergavenny	6,265 0
J. G. Thomas & Sons, Abergavenny	6,180 0
W. & L. Price, Penarth	6,062 13
J. Jenkins, Brynmawr	5,900 0
F. G. Robbins, Cardiff	5,832 10
J. Newcombe, Ebbw Vale	5,782 10
J. Morgan,* Blaenavon	5,576 0

* Accepted.

CARDIFF.—For additions to warehouses in Millicent Street, for Messrs. John Isaac & Sons. Mr. Edgar G. C. Down, A.R.I.B.A., architect, 31 High Street, Cardiff:—

W. Thomas & Co.	£570 0	S. Shepton & Son	£416 10
Geo. Griffiths	455 0	David Davies	445 0
Lattey & Co., Ltd.	489 0	W. T. Morgan*	398 0
Knox & Wells	435 0	F. Small	340 0

* Accepted.

CHURCHDOWN (GLOUCESTER).—For the erection of additional buildings to school at Churchdown, for the Churchdown School Board. Mr. A. J. Dunn, architect, 31 St. Michael's Square, Gloucester:—

R. W. T. Merritt, Churchdown	£1,372 19 8
W. Bowers & Co., Bath Street, Hereford	1,283 0 0
T. J. Williams, Bristol Road	1,159 18 0
Collins & Godfrey, The Cross, Tewkesbury	1,159 0 0
J. Gurney	1,148 0 0
A. J. Dolman, Ryecroft Street	1,109 0 0
Freeman & Jones, Sherbourne Street	1,097 0 0
A. King & Son,* Barton Street	998 0 0

* Accepted. [Rest of Gloucester.]

COTHERSTONE (DURHAM).—For the construction of 3,400 yards of 12in., 9in., and 6in. pipe sewers, with manholes, lampholes, and flushing chambers, the necessary tanks and bacteria beds, together with the laying-out of a plot of land, and other works for the sewerage and sewage disposal of Cotherstone, for the Startforth Rural District Council. Mr. J. E. Parker, A.M.I.C.E., engineer, Post Office Chambers, Newcastle-on-Tyne:—

S. Dart, Kyo	£2,758 5 3
W. & J. Lamb, Newcastle	2,506 13 7
W. Carr, Gosforth	2,424 19 0
J. Kyle & Sons, Barnard Castle	2,380 0 0
G. H. Bell, Bishop Auckland	2,305 9 11
P. O. Heatherington, Castle Eden	2,253 6 3
Robson & Banks, Whitley	2,240 1 3
S. Walker, Cockfield	2,150 0 0
I. Heatherington,* Cotherstone	2,074 8 0
R. Wilson, Barnard Castle	1,988 0 0

* Accepted. [Engineer's estimate, £2,200.]

DEVIZES.—For the erection of an isolation hospital. Messrs. Bell, Withers, & Meredith, architects, London:—

W. Webb, Bath	£10,816 0 0
Kingerle & Son, Oxford	10,605 5 3
Wort & Way, Salisbury	10,450 10 10
Holloway Bros., London	10,291 0 0
R. B. Mullings, Devizes	9,627 0 0
W. E. Chivers, Devizes	9,476 0 0
H. Ash,* Devizes	9,379 0 6

* Provisionally accepted.

DOVER.—For widening Folkestone Road, providing and laying kerbing, channelling, and tar paving, building a retaining wall, and other works in connection therewith, for the Town Council. Mrs Henry E. Stilgoe, A.M.I.C.E., borough engineer:—

G. Munro, Heathfield Avenue, Dover	£1,519 2 0
G. Grigg, Ramsgate	1,470 18 4
Austen & Lewis, Salisbury Road, Dover	1,455 6 0
D. & G. Keeler,* Buckland Avenue, Dover	1,314 4 0

* Accepted.

EASTBOURNE.—For the erection of proposed branch public library and baths on the site in Seaside, for the Technical Instruction Committee. Mr. William Chapman Field, borough architect:—

Martin, Wells, & Co., Vauxhall, London	£2,450
C. P. Dennis & Co.	2,348
F. Rich, Seaside	2,324
M. Hookham	2,248
W. & E. Noakes*	2,188

* Accepted. [Rest of Eastbourne.]

EASTBOURNE.—For the construction of two public convenience. and alterations to existing shelters, situate on the Grand Parade, for the Pleasure Grounds Committee. Mr. R. M. Gloyne, A.M.I.C.E., borough engineer:—

Tapner & Co., Hastings	£5,200
J. Peattie, Baker Street, E.C. (Jenning's fittings)	3,700
J. E. Johnson & Son, Leicester	3,660
Finch & Co., Belvedere Road, S.E. (own fittings)	3,558
Jennings & Co., Lambeth, S.E. (own fittings)	3,516
J. C. Lacey,* Willingdon Road, Eastbourne	3,150

* Accepted.

GAINSBOROUGH.—For the erection of an engine-house for No. 2 borehole at the waterworks, for the Urban District Council:—

C. M. Greenwood, Gainsborough	£2,510 0 0
F. D. Goodwin, Retford	2,184 0 0
A. J. Elmes,* Gainsborough	2,172 19 9

* Accepted.

LONDON.—For enlargement of Addison Gardens School, for the London School Board. Mr. T. J. Bailey, architect:—

H. Wall & Co.	£7,180 0 0
General Builders, Ltd.	7,156 0 0
E. P. Bulled & Co.	7,100 0 0
Leslie & Co., Ltd.	7,024 9 0
J. & M. Patrick	6,855 0 0
Treasure and Son	6,457 0 0
J. Simpson & Son	6,450 0 0
Stimpson & Co.	6,445 0 0
Spencer, Santo & Co., Ltd.	6,422 8 11
E. Triggs	6,419 0 0
W. Johnson & Co., Ltd.*	6,262 0 0

* Recommended for acceptance.

LONDON.—For improvement works at Park Wall School, for the London School Board. Mr. T. J. Bailey, architect:—

J. Allen & Sons, Ltd.	£12,906	J. Simpson & Son	£11,594
T. L. Green	12,794	C. Cox	11,568
Lathey Bros.	12,629	Treasure & Son	11,544
E. Lawrance & Sons	12,449	Kirk & Randall	11,448
J. & C. Bowyer	11,833	Stimpson & Co.	11,380
Leslie & Co., Ltd.	11,765	J. & M. Patrick*	11,329
W. Johnson & Co., Ltd.	11,690	C. Wall	11,165

* Recommended for acceptance.

LONDON, N.—For special school for 60 children, and manual training centre for 40, at Upper Hornsey Road, for the London School Board. Mr. T. J. Bailey, architect:—

W. King & Son	£5,920	H. Wall & Co.	£5,219
Willmott & Sons	5,696	Treasure & Son	5,214
C. Dearing & Son	5,567	C. Cox	5,190
G. S. S. Williams & Son	5,536	L. H. & R. Roberts	5,143
W. Gregar & Son	5,429	J. Outhwaite & Sons	4,989
McCormick & Sons	5,410	E. Lawrance & Sons*	4,988
W. M. Dabbs	5,271		

* Recommended for acceptance.

LONDON, S.E.—Nor the erection of stabling, Peckham, for Messrs. Gatti, Stevenson & Slaters, Ltd. Mr. H. Phelps-Drew, architect, 33 King Street, Covent Garden. Quantities by Mr. J. Rookwood, 25 Bedford Row, W.C.:—

Spencer, Santo & Co.	£4,950	Carmichael	£4,736
Williams & Son	4,875	Edwards & Medway	4,707
Richards & Co.	4,840	Wilkinson Bros.	4,604
Higgs & Hill	4,824	F. G. Minter*	4,435

* Accepted.

NEWHAVEN (SUSSEX).—For the construction of about 720yds. of new sewer, together with manholes, ventilating shafts, and house connections; also for repairing, levelling, and making-up of various streets and footpaths in the district; also for providing and fixing two new iron enclosed urinals, with flushing apparatus, water supply, lighting, and drainage complete, for the Urban District Council. Mr. F. J. Rayner, town surveyor:—

J. G. Pickard, Turner's Hill, Sussex	£1,740 16 0
H. Bentham & Co., Streatham Hill, Surrey	1,571 0 0
Peerless-Dennis & Co., Eastbourne	1,524 0 0
B. Cooke & Co., London	1,415 0 0
Grounds & Newton, Bournemouth	1,380 0 0
W. Langridge & Son, Croydon	1,194 4 0
H. A. Chambers,* Seaford	1,052 3 10

* Accepted.

PONTEFRACT.—Accepted for the erection of two houses in Linden Terrace, Pontefract, for Mrs. A. L. Robinson. Mr. Charles Keyworth, architect:—

H. Gundill, bricklayer	£278 10 0
G. Robinson, joiner	155 0 0
G. Spurr, slater	38 17 0
T. Leng, plumber	91 3 6
T. Senior, plasterer	35 10 0
T. Burton & Son, painters	16 0 0

[All of Pontefract.]

PRIMLEY (PAIGNTON).—For alterations and additions for Mr. Henry Conway Belfield. Messrs. Bridgman & Bridgman, architects, Paignton:—

General work.

R. Harris	£2,689	W. Lethbridge	£2,630
G. Webber	2,662	H. Webber & Sons	2,615
E. Westlake	2,652	Dart & Pollard*	2,202
C. & R. E. Drew	2,648		

Painting and decorating.

Thomas & Sons	£184 0	Thomas & Co.*	£188 15
C. & R. E. Drew	188 10	H. Webber & Sons	195 0

Plumbing, gasfitting, &c.

C. Bootyman	£200

* Accepted. [All of Paignton.]

READING.—For construction of electric tramways at Reading, for the Corporation:—

W. Pattinson & Son, Ruskington	£136,543 0 0
B. Cooke & Co., London	104,000 0 0
G. Law, Kidderminster	95,163 0 0
A. Faulks, Loughborough	91,606 0 0
Osman, Southampton	90,143 0 0
C. Chadwell, Blackburn	87,085 0 0
W. Griffiths & Co., Ltd., London	85,407 0 0
R. W. Blackwell, Ltd., London	84,644 0 0
E. Nuttall,* Manchester	83,882 0 0
Dick, Kerr & Co., Ltd., London	83,443 0 0
Estimate, exclusive of points and crossings.	
Dick, Kerr & Co.	81,006 10 0
R. W. Blackwell & Co.†	79,827 15 0
W. Griffiths & Co.	78,724 13 0
E. Nuttall	77,579 3 8

* Accepted. † With Sykes's joint, extra.

SHIRLEY, WOODSIDE (CROYDON).—For the erection of cottage homes, Shirley Lodge Farm, Woodside, for the Guardians of St. Olave's Union. Messrs. Newman & Newman, architects, 31 Tooley Street, London Bridge, S.E.:—

Bulled & Co.	£160,000	Goddard	£138,500
Balaam Bros.	157,028	Holloway	134,000
Willcox & Co.	141,845	Patrick	129,000
Bowyer & Co.	141,810	C. Wall,* Chelsea	128,620
Colls & Sons	141,500	Saunders	123,164

* Accepted.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Nov. 14	Castleisland, co. Kerry—Church Tower and Spire	——	D. J. Coakley, 1 Charlotte Quay, Cork.
„ 14	Bryn, nr. Port Talbot—Seating, Pulpit, Choir, Stalls, &c.	——	F. B. Smith, Architect, Port Talbot.
„ 14	New Bilton, near Rugby—Alterations, &c., to Royal Oak Inn.	Phillips & Marriott, Ltd.	H. W. Chattaway, Trinity Churchyard, Coventry.
„ 14	Cork—Bricks, Slates, Cement, Cut Stone, &c.	Town Council	City Engineer, Municipal Buildings, Cork.
„ 14	Northampton—Goods Warehouse	Midland Railway Company	Company's Architect, Cavendish House, Derby.
„ 15	London, S.E.—Plain Iron Mission Church to seat 250	——	Rev. J. Ferguson, 10 New Cross Road, S.E.
„ 15	Birmingham—Building Materials	Kynoch Limited	Secretary, Kynoch Limited, Witton, Birmingham.
„ 16	Runcorn—Six Fire-Escape Stairs at Workhouse	Union Guardians	G. F. Ashton, 71 High Street, Runcorn.
„ 16	London, W.—Repairs at 203–5 Harrow Road	Metropolitan Asylums Board	T. D. Mann, Clerk, Offices, Embankment, E.C.
„ 16	Lidgett Park, Leeds—Four Houses	——	J. W. Lawton, 86 Albion Street, Leeds.
„ 16	Mountcross—Repairs, &c., to Workhouse Infirmaries	Macroom Union Guardians	J. T. Murphy, Clerk, Union Offices, Macroom, Ireland.
„ 17	Tywardreath, Cornwall—Schools	School Board	J. Cook, Clerk, Tywardreath, Par Station, Cornwall.
„ 18	Armley—Alterations to Hospital at Workhouse	Bramley Union Guardians	Beckwith & Webster, 2 Basinghall Square, Leeds.
„ 18	Levenshulme, Manchestar—Electricity Sub-Station	Manchester Corporation	City Surveyor, Town Hall, Manchester.
„ 18	Enniskillen—Monastic Dwellings and Intermediate and Technical Schools.	Rev. Brother Superior, St. Michael's School.	A. Scott & Son, Architects, Drogheda.
„ 18	Ramsey, Hunts—Alterations and Additions to Schools	School Board	J. G. Stallebrass, Architect, North Street, Peterborough.
„ 18	Govan, Glasgow—Children's Block at Poorhouse	Parish Council	A. Wallace, 7 Carlton Place, Glasgow.
„ 18	Vickerstown, Barrow-in-Furness—5 Shops and Houses	——	Isle of Walney Estates Co., Ltd., Walney, Barrow-in-Furness.
„ 18	Leeds—Engine House, Stabling, &c., at Fire Station	Watch Committee	P. Robinson, 72 Albion Street, Leeds.
„ 18	Drum—Renovation of Parish Church	Incumbent and Churchwardens	Drum Glebe.
„ 18	Hayle—School Buildings and Alterations to Chapel	Foundry Wesleyan Chapel Trustees	S. Hill, Architect, Green Lane, Redruth.
„ 18	Heston and Isleworth—Twenty-two Workmen's Houses	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow.
„ 18	Middlesbrough—Museum Building	A. J. Dorman	J. M. Bottomley, 28 Albert Road, Middlesbrough.
„ 18	Stockport—New Bakery at Workhouse	Guardians	J. Hunt & Son, 4 Warren Street, Stockport.
„ 18	Pontlottyn, Wales—Houses	Workmen's Building Club	T. Roderick, Architect, Clifton Street, Aberdare.
„ 18	Blackburn—Alteration to Shed Roof	Sewage Committee	W. Stubbs, Borough and Water Engineer, Blackburn.
„ 18	Bournemouth—Engine and Boiler House, &c.	Town Council	F. W. Lacey, Borough and Tramway Engineer, Municipal Office, Bournemouth.
„ 18	Charlestown, near Hebden Bridge, Yorks—Inn	——	W. H. D. Horsfall, Architect, Tower Chambers, Halifax.
„ 18	Croydon—Electricity Sub-Station	Town Council	Borough Electrical Engineer's Office, Factory Lane, Croydon.
„ 18	Hounslow—Houses for Working Classes	Urban District Council	P. G. Parkman, Engineer and Surveyor to the Council, Town Hall, Hounslow.
„ 18	Manchester—Builders' Work	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
„ 18	Glasgow—Bricks, Cement, Lime, Slates, &c.	Caledonian Railway Company	J. Lorimer, Stores Superintendent, Caledonian Railway, Charles Street, St. Rollox, Glasgow.
„ 18	Liscard—Extensions at Infectious Diseases Hospital	Wallasey Urban District Council	W. H. Travers, Engineer, Public Offices, Egremont, Cheshire.
„ 19	Bradford—Four Houses	——	H. E. Priestley, 17 Bertram Road, Manningham, Bradford.
„ 19	Newcastle-upon-Tyne—Cement, Lime, Mortar, &c.	Town Improvement Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
„ 19	Pemberton, near Wigan—Police Station	Lancashire County Council	H. Littler, Architect, County Offices, Preston.
„ 19	London—Carpenters', &c., Jobbing Work for three years	Corporation	Engineer, Public Health Department, Guildhall, E.C.
„ 19	Blaenavon, Mon—Sliding Glazed Partitions, New Desks	School Board	Lansdowne & Giggs, Metropolitan Bank Chambers, Newport, Mon.
„ 19	The Oaks Station, nr. Bolton—Reconstruction of Platforms, &c.	Lancs and Yorks Railway	Engineer, Hunt's Bank, Manchester.
„ 19	Bolton—Cotton and Machinery Shed, &c.	Lancs and Yorks Railway	Engineer, Hunt's Bank, Manchester.
„ 20	Denton, Manchester—Electricity Sub Station	Manchester Corporation	City Surveyor, Town Hall, Manchester.
„ 20	Heaton Norris, Manchester—Electricity Sub-Station	Manchester Corporation	City Surveyor, Town Hall, Manchester.
„ 20	Darlington—Enlargement of Head Post Office	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.
„ 20	Kew—Wing of Herbarium in Gardens	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.
„ 20	Brentford—Isolation Hospital, with Administrative Buildings, &c.	Chiswick Urban District Council	A. Ramsden, Surveyor, Town Hall, Chiswick.
„ 20	Dartmouth—Offices and Dwelling House	Channel Coaling Co., Ltd.	Company's Offices, South Embankment, Dartmouth.
„ 21	London, E.C.—Building Materials	London General Omnibus Co., Ltd.	Coach Factory, 235 Upper Street, Islington, N.
„ 21	Rishworth, near Halifax—Rebuilding Paper Mills	——	R. Horsfall & Son, Architects, Commercial Street, Halifax.
„ 21	Wallasey—Offices for Tramways Department	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
„ 21	Redhill—Business Premises	Market Hall Co., Ltd.	Clayton & Black, 152 North Street, Brighton.
„ 22	Newbridge, near Ruabon—House, Out-Offices, &c.	——	W. H. Johns, Architect, Vroncysyllte, Llangollen.
„ 22	Ystalyfera and Pontardawe, Wales—Schools	Llanguicke School Board	W. W. Williams, 63 Wind Street, Swansea.
„ 22	London, E.C.—Slates, Blue Bricks, Cement, Stone, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
„ 23	Shettleston, Glasgow—Waiting-room and Workman's House.	Lightburn Joint Hospital Committee	A. Cullen, Architect, Brandon Chambers, Hamilton.
„ 23	Swindon—Brick Gasholder Tank	Gas Company	J. J. Jervis, Secretary, Gas Offices, Queen Street, Swindon.
„ 23	Leeds—Free Library	Library Committee	W. Bakewell, 38 Park Square, Leeds.
„ 23	Cwmaman—Eighteen Houses	Cottage Co., Ltd.	J. Ll. Smith & Davies, Architects, Aberdare.
„ 25	Horwich—Infectious Diseases Hospital	Hospital Committee	T. Partington, 117 Market Street, Westhoughton, Bolton.
„ 25	Littlemore—Additions to Asylum	Committee of Visitors	County Surveyor, Oxford.
„ 25	Middlesbrough—County Court	Commissioners of H.M. Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
„ 26	West Ham, E.—Thirty-six Double-tenement Workmen's Houses.	Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
No date.	Wood, Southtawton—House, &c.	W. Lethbridge	J. Jerman, 5 Bedford Circus, Exeter.
„	Hunslet—Rebuilding Inn	E. Wilson	W. M. Coggill, Architect, Beech Grove, Stourton.
	ENGINEERING:		
Nov. 14	Manorhamilton, Ireland—Water Supply Scheme	Rural District Council	P. Keany, Clerk, District Council Office, Manorhamilton.
„ 14	Wimbledon—Wiring Electricity Works	Urban District Council	F. B. Spencer, Electrical Engineer to Council, Broadway, Wimbledon.
„ 14	Woolwich—10-ton Steam Roller	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
„ 15	Woolwich—Electrical Instruments	Borough Council	J. B. Mitchell, Borough Electrical Engineer, Council Offices, Maxey Road, Plumstead.
„ 15	St. Anne's-on-Sea, Lancs—Street Mains	Urban District Council	P. J. S. Tiddeman, Engineer, Electricity Works, St. Anne's-on-Sea.
„ 15	Tibshelf and Shirland—Widening and Alterations to Bridge.	Chesterfield Rural District Council	T. J. Robinson, Surveyor, Hasland, Chesterfield.
„ 16	Chesham—Electric Lighting	Urban District Council	J. G. How, Clerk, Chesham.
„ 18	Bury, Lancs—Tramcars	Tramways Committee	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 18	Girvan, Scotland—Storage Reservoir, &c	Town Council	J & H. V. Eaglesham, Wellington Chambers, Ayr.
„ 18	Barr Wood, St. Ninians, Stirlingshire—Embankment and Reservoir.	——	Crouch & Hogg, 53, Bothwell Street, Glasgow.
„ 18	Glasgow—Telegraph and Electrical Appliances	Caledonian Railway Company	J. Lorimer, Stores Superintendent, Caledonian Railway, Charles Street, St. Rollox, Glasgow.
„ 19	London—Engineers' and Smiths' Jobbing Works (for three years).	Streets Committee of Corporation	Engineer, Public Health Department, Guildhall, E.C.
„ 19	Aldershot—Repairs to Steam Roller	Urban District Council	Surveyor, 126 Victoria Road, Aldershot.
„ 19	Bolton—Widening Line and Reconstructing Station Platforms.	Lancs and Yorks Railway	Engineer, Hunt's Bank, Manchester.
„ 20	Brentwood, Essex—Bacteria Beds, Tanks, Engine House, &c.	Urban District Council	H. Jones, Parliament Mansions, Victoria Street, Westminster.
„ 20	Wimbledon—Settling Tanks, &c.	Urban District Council	Council Offices, Broadway, Wimbledon.
„ 21	Easingwold, Yorks—Covered Concrete Reservoir (120,000 gallons).	Rural District Council	Fairbank & Sons, 13 Lendal, York.
„ 22	London, E.C.—Gas, Water and Steam Pipes and Fittings, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
„ 23	Boulder City, Western Australia—Electric Tramway	City Council	Agent-General's Office, London.
„ 25	King's Lynn—Tug	Conservancy Board	J. Pollock, Sons & Co., 22 Billiter Street, E.C.
„ 25	Dublin—Electrical Supplies, &c.	United Tramways Company	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
„ 25	Liverpool—Overhead Electric Equipment of Tramways	South Lancs. Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
„ 25	Kettering—Extension of Sewers, &c.	Urban District Council	T. R. Smith, Surveyor, Market Place, Kettering.
„ 26	London, N.—Electric Lamp Columns, Arc Lamps, &c.	Islington Borough Council	Borough Electrical Engineer, 50 Eden Grove, Holloway.
„ 26	East London, South Africa—Electric Plant	——	Dyer & Dyer, 17 Aldermanbury, E.C.
„ 28	Hull—Six Rotary Transformers	Electric Lighting Committee	T. G. Milner, Town Hall, Hull.
„ 30	Clitheroe, Lancs—Sewage Settling Tanks, &c.	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.
No date.	Durban, South Africa—Pier	Concessionaire	R. St. George Moore, 17 Victoria Street, S.W.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	FURNITURE:		
Nov. 14	Rochdale—Furnishing Workhouse Infirmary	Union Guardians	R. A. Leach, Clerk, Union Offices, Townhead.
„ 18	Kingston upon-Thames—Cupboards, Entrance Gates, &c.	Guardians	J. Edgell, Clerk, Union Offices, Coombe Lane, Norbiton, Kingston-upon-Thames.
„ 18	Dublin—Furniture and Fittings at Morgue and Coroner's Court.	Corporation	City Architect, Municipal Buildings, Cork Hill, Dublin.
„ 19	Donabate, co. Dublin—Benches, &c., for Asylum Chapels	Committee of Management	G. C. Ashlin, 7 Dawson Street, Dublin.
	IRON AND STEEL:		
Nov. 14	Cork—Iron, &c.	Town Council	City Engineer, Municipal Buildings, Cork.
„ 15	Birmingham—Iron and Steelware, Picks, Shovels, Nails &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
„ 15	Witton, Brmnghm.—Bolts, Nuts, Tubes, Metalware, &c.	Kynoch, Ltd.	Secretary, Kynock Ltd., Witton, Birmingham.
„ 18	Glasgow—Bolts and Nuts, Hardware, Tools, &c. ..	Caledonian Railway Company	J. Lorimer, Stores Superintendent, Caledonian Ry., Charles Street, St. Rollox, Glasgow.
„ 19	Newcastle-upon-Tyne—Iron and Steel. Nails, &c. ..	Town Improvement Committee	City Engineer, Town Hall, Newcastle-on-Tyne.
„ 19	London, E.C.—Wrought-iron Bars Plates &c.	South Mahratta Railway Co., Ltd. ..	Secretary, 46 Queen Anne's Gate, Westminster, S W.
„ 19	London, S.W.—Steel Rails and Sleepers Fishbolts, &c.	Secretary of State for India in Council ..	Director-General of Stores, India Office, Whitehall, S.W.
„ 19	London, S.W.—Wrought-iron Fencing and Gates ..	London County Council	Parks Department, 11 Regent Street, S.W.
„ 20	Christiania—Fishplate Screws. Hookbolts, &c.	Norwegian State Railway Department ..	Commercial Department, Foreign Office, S.W.
„ 21	London, E.C.—Ironmongery, Gas & Water Fittings, &c.	London General Omnibus Co., Ltd. ..	Company's Coach Factory, 235 Upper Street, Islington, N.
„ 22	London, E.C.—Galvanized Iron, Cast-iron Pipes, Stoves, Bolts, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E C.
„ 25	Dublin—Iron, Steel Castings. &c.	United Tramways Co.	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
„ 26	London, N.—Electric Lamp Columns, &c.	Islington Borough Council	Borough Electrical Engineer, 50 Elen Grove, Holloway, N.
„ 27	Dublin—Castings, Tools, Iron Tubes and Fittings, &c.	Great Southern & Western Ry. (Ireland)	Company's Storekeeper, General Stores, Inchicore, Dublin.
„ 29	Warrington—Nails, Screws, Bolts, Fishplates, &c. ..	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
	PAINTING AND PLUMBING:		
Nov. 14	Cork—Paints, Oils, &c.	Town Council	City Engineer, Municipal Buildings, Cork.
„ 14	Castleford—Painting Interior of Market Hall	Urban District Council	Mr. Green, Surveyor, Council Offices, Castleford.
„ 15	Birmingham—Brushes, Oils, Paints, Lead Piping, &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
„ 15	Witton, Birmingham—Paints, Lead, Oils, &c.	Kynoch, Ltd.	Secretary, Kynoch Ltd., Witton, Birmingham.
„ 18	Glasgow—Colours and Paints, Oils, Lead, &c.	Caledonian Railway Company	J. Lorimer, Stores Superintendent, Caledonian Rly., Charles Street, St. Rollox, Glasgow.
„ 19	Bradford—Inside Painting, &c., at Schools	School Board	T. Garbutt, Clerk, School Board Offices, Manor Row, Bradford.
„ 19	Newcastle-upon-Tyne—Oils, Paints, &c...	Town Improvement Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
„ 19	London—Plumbers' and Painters' Jobbing Works (for three years).	Streets Committee of the Corporation ..	Engineer, Public Health Department, Guildhall.
„ 20	Manchester—Oil	Gas Committee	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
„ 20	South Dublin—Painting, Papering, &c., Dining Halls and Master's Offices.	Union Guardians	J. P. Condon, Clerk, Board Room, James's Street, Dublin.
„ 21	London, E.C.—Oils, Glass, &c.	London General Omnibus Co., Ltd. ..	Company's Coach Factory, 235 Upper Street, Islington, N.
„ 22	London, E C.—Colours, Brushes, Lead, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
„ 23	Leeds—Painting Free Library	Corporation	W. Bakewell, 35 Park Square, Leeds.
„ 23	Shettlestone—Plumber Work at Hospital	Lightburn Joint Hospital Committee ..	A. Cullen, Architect, Brandon Chambers, Hamilton.
„ 25	Harrogate—Colouring, Painting, at Convalescent Home	— ——	B. Shaw, Secretary, Royal Bath Hospital, &c., Harrogate.
„ 25	Canterbury—Painting Buildings on Sewage Farm ..	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, High St., Canterbury.
„ 25	Canterbury—External Painting	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, High St., Canterbury.
„ 25	Dublin—Paints, Brushes, &c.	United Tramways Co.	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
„ 27	Dublin—Brushes, Colours, &c.	Great Southern & Western Ry. (Ireland)	Company's Storekeeper, General Stores, Inchicore, Dublin.
„ 29	Warrington—White Lead, Oils, Lead Piping & Sheet, Brushes, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
	ROADS AND CARTAGE:		
Nov. 14	London, S.E.—Kerbing and Tarpaving	Lewisham Borough Council	Surveyor, Town Hall, Catford, S.E.
„ 15	Preston, Lancs—Paving, Flagging, &c., Streets ..	———	Borough Surveyor, Town Hall, Preston.
„ 16	Radcliff, Lancs—Planting Trees and Shrubs in Park ..	Urban District Council	W. L. Rothwell, Surveyor, Council Offices, Radcliffe.
„ 18	Pontlottyn—Laying Drains and Forming Roads ..	D. W. Jones	T. Roderick, Clifton Street, Aberdare.
„ 18	Blackburn—Road Works, Retaining Walls, &c. ..	Highways Committee	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
„ 18	Blackburn—Street Works	Highway Committee	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
„ 18	Wednesbury—Repaving, Kerbing, Channelling, &c. ..	Corporation	E. M. Scott, Borough Surveyor, Town Hall, Wednesbury.
„ 19	Wimbledon—Levelling and Turfing Recreation Ground	Urban District Council	C. H. Cooper, Surveyor, Broadway, Wimbledon.
„ 19	Aldershot—Tip Carts	Urban District Council	Surveyor, 126 Victoria Road, Aldershot.
„ 19	Newcastle-upon-Tyne—Pitch, Tar, Whinstone, Flags, Kerbs, &c.	Town Improvement Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
„ 19	London, S.W.—Gravel for Parks, &c.	London County Council	Parks Department, 11 Regent Street, S W.
„ 20	Croydon—Highway Improvements	Rural District Council	R. M. Chart, Surveyor, Council's Offices, Town Hall, Croydon.
„ 20	Macclesfield—Street Making, &c...	Town Council	E. E. Adshead, Borough Engineer, Town Hall, Macclesfield.
„ 20	Nelson, Lancs—Private Street Works	Sewerage and Streets Committee	B. Ball, Borough Surveyor, Town Hall, Nelson.
„ 20	Bostall Heath—Roadmaking, Levelling, &c.	Woolwich Union Guardians	Church, Quick & Whincop, Architects, William Street, Woolwich.
„ 21	Reading—Street Improvement Works	Sanitary Authority	J. Bowen, Borough Surveyor, Town Hall, Reading.
„ 23	Cwmaman—Roads, &c.	Cottage Co., Ltd.	J. Ll. Smith & Davies, Architects, Aberdare.
„ 24	Middlesbrough—Street Repairs, &c.	Streets Committee	Borough Engineer, Municipal Buildings, Middlesbrough.
„ 25	Dublin—Harness Materials	Dublin United Tramways Co.	Secretary, 9 Upper Sackville Street, Dublin.
„ 26	Isleworth—200 Tons Guernsey Granite Spalls	Brentford Union Guardians	W. Stephens, Clerk, Union Offices, Isleworth.
„ 30	Johannesburg—Pavements	———	" The Times," London, E.C.
	SANITARY;		
Nov. 14	Cork—Sewer Pipes, Sanitary Requisites, &c.	Town Council	City Engineer, Municipal Buildings, Cork.
„ 14	Glass Houghton, near Pontefract—Sewerage Scheme	Rural District Council	W. L. Le Maitre, Greek Street Chambers, Leeds.
„ 14	Hoyland, near Barnsley—Pipe Sewer, &c.	Urban District Council	W. P. Young, Surveyor, Town Hall, Hoyland.
„ 15	Heage—Sewage Disposal Works and Sewers	Urban District Council	Hunter & Woodhouse, Engineers, Belper.
„ 15	Birmingham—Earthenware Drain Pipes, &c.	Water Committee	Secretary, 44 Broad Street, Birmingham.
„ 16	Maldon, Essex—Sewer, Filter Tanks, &c.	Rural District Council	H. G. Keywood, Engineer, Public Hall Chambers, Maldon.
„ 18	Pontlottyn, Wales—Laying Drains and Forming Rds.	Workmen's Building Club	T. Roderick, Architect, Clifton Street, Aberdare.
„ 18	Shirehampton, near Bristol—Sewers, &c.	Breton Regis Rural District Council ..	A. P. I. Cotterill, 28 Baldwin Street, Bristol.
„ 19	London, E.C.—New Sewer in Gt. Saint Helens ..	Streets Committee of Corporation	Engineer, Public Health Department, Guildhall, E.C.
„ 19	Newcastle-upon-Tyne—Pipes, &c.	Town Improvement Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
„ 20	Newport Pagnell, Bucks—Sewerage and Sewage Disposal Works.	Urban District Council	D. Balfour & Son, 1 Victoria Street, Westminster, S.W.
„ 20	Brentwood—Bacteria Beds, Tanks, &c.	Urban District Council	H. Jones, Parliament Mansions, Victoria Street, Westminster.
„ 22	London, E.C.—Drain Pipes, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
„ 23	Harrow-on-the-Hill—Sewerage Works	Urban District Council	J. P. Bennetts, Surveyor to Council, Harrow-on-the-Hill.
„ 23	Cwmaman—Sewers and Surface Water Drains ..	Cottage Co., Ltd.	J. Ll. Smith & Davies, Architects, Aberdare.
„ 25	Kettering—Sewers, &c.	Urban District Council	T. R. Smith, Surveyor, Market Place, Kettering.
„ 27	Dublin—Sewer Pipes, &c.	Gt. Southern & Western Rly (Ireland) ..	Company's Storekeeper, General Stores, Inchicore Dublin.
„ 29	Warrington—Drain Pipes, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 30	Clitheroe, Lancs—Two Setting Tanks on Sewage Farm	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.
„ 30	Holmfirth, Yorks—Sewerage and Sewage Disposal Works.	Urban District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster, S.W.
Dec. 3	London, W.—Removal of House-refuse	St. Marylebone Borough Council	Town Clerk, Town Hall, Marylebone Lane, W.
	TIMBER:		
Nov. 14	Cork—Timber, &c.	Town Council	City Engineer, Municipal Buildings Cork.
„ 14	Newcastle-upon-Tyne—Timber	———	City Engineer, Town Hall, Newcastle-upon-Tyne.
„ 15	Hull—2,000 Loads of Hardwood, Planks, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 15	Birmingham—Timber, &c...	Water Committee	Secretary, 44 Broad Street, Birmingham.
„ 15	Witton, Birmingham—Timber, &c.	Kynoch Limited	Secretary, Kynoch Limited, Witton, Birmingham.
„ 18	Lisbon—Mineral Oil for Timber Injections	Royal Portuguese Railway Co.	Company's Officer, 28 Rue de Chateaudun, Paris.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	TIMBER—*continued.*		
Nov. 19	Donabete, co. Dublin—Pitch Pine Benches in Asylum Chapels.	—	G. C. Ashlin, 7 Dawson Street, Dublin.
" 19	Bolton—Re-erection of Timber Gantry	Lancs and Yorks Railway	Engineer, Hunt's Bank, Manchester.
" 20	Cardiff—Pitwood, Propwood, &c...	Nixon's Navigation Co., Ltd.	Offices of Company, Bute Docks, Cardiff.
" 29	Warrington—Creosoted Sleepers and Crossing Timbers, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov. 14	Manorhamilton—Water Supply Scheme	—	P. Keany, Clerk to R.D.C., Manorhamilton, Ireland.
" 14	Kingston-upon-Thames—Public Library	—	H. A. Winser, Town Clerk, Kingston-on-Thames.
" 22	Barnsley—Guardians' Offices	£20.	C. J. Tyas, 17 Regent Street, Barnsley.
" 23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
" 23	Bexhill—Isolation Hospital	£25.	E. S. Douglas, Town Hall, Bexhill.
Dec. 17	Tywardreath—Board Schools	—	J. Cook, Clerk to School Board, Tywardreath, Par Station, Cornwall.
" 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902.			
Jan. 31	Hull—Art School (cost not to exceed £10,000) ..	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No Date.	Ilkley—New Church and Schools..	—	Rev. W. Jones, Hope House, Hebden Bridge.

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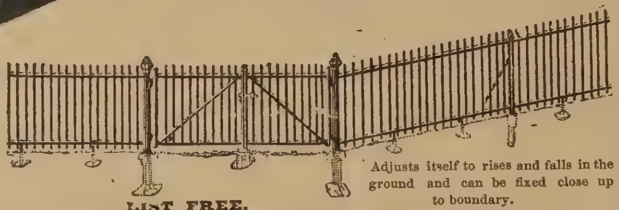

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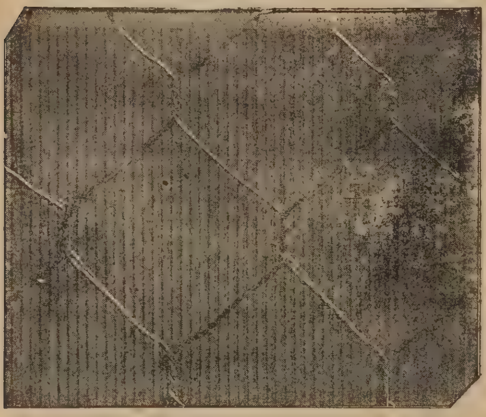

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A PROFESSIONAL OPINION.

Mr. H. R. HARDING, Architect, of Leicester, writes under date October 10th, 1901:

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COMING EVENTS.

Wednesday, November 13.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, B.A., M.D., on "The Hygiene of Byres, Lairs, &c.," 7 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. S. A. Gordon on "Notes on some of the Cathedral Towns of England," 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Opening Meeting of Session. Address by the president, Mr. Frank Cows, F.R.I.B A., 7.30 p.m.

INSTITUTION OF SANITARY ENGINEERS.—Meeting of General Purposes and Finance Committee at 4 p.m. and of Council at 7 p.m.

Thursday, November 14.

CAMERA CLUB.—Mr. Basil N. Tebbs, on "Bacteria," 8.15 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. C. F. Brindley, on "Organ Cases and Organ Chambers."

MANCHASTER SOCIETY OF ARCHITECTS. — Mr. Paul Waterhouse, M.A., on "Architecture among the Modern Arts," 6.45 p.m.

Friday, November 15.

ARCHITECTURAL ASSOCIATION.—Mr. Max Clarke on "The Sanitation of a Country House," 7.30 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part II.).—Mr. E. Petronell Manby, B.A., M.D., on "The Laws, By-laws, and Regulatious affecting the Infection and Sale of Meat, &c.," 7 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Prof. W. E. Dalby, on "The Balancing of Locomotives," 8 p.m.

Monday, November 18.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. R Anning Bell, on "Mosaics," 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Meeting in Free Library, William Brown Street. Exhibition of Collection of Books on Architectural Subjects 6 p m.

SURVEYOR'S INSTITUTION.—First Junior Meeting at 7 p m.

ROYAL ACADEMY.—Demonstration in Anatomy: The Trunk. By Prof. Arthur Thomson, M.A, 4 p.m

Tuesday, November 19.

INSTITUTION OF CIVIL ENGINEERS.—Mr. John A. F. Aspinall, M.I.C.E., on "Train Resistance," 8.m.

SOCIETY OF DESIGNERS.—Mr. George C. Haité, R.I., R.B.A., on "Some Remarks on Design and Designers of the Victorian Epoch," 8 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Ordinary Meeting at 7.45 p.m.

Wednesday, November 20.

RUSKIN SOCIETY OF BIRMINGHAM.—Mr. Howard S. Pearson on "The Pathetic Fallacy," 7.45 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

DANTE SOCIETY.—Lecture by Dr. Hodgkin, 3 p m.

SOCIETY OF ARTS.—Opening Address by the Chairman of the Council, Sir William Henry Preece, K.C B., F.R.S., 8 p.m.

Thursday, November 21.

ROYAL ACADEMY.—Demonstration in Anatomy: The Trunk and Upper Extremity. By Prof. Arthur Thomson, M.A., 4 p.m.

Friday, November 22.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—Mr. Vivian H. King, on "Design in Furniture," 7.30 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. George Herbertson on "Foreign Competition in the Building Trades," 8 p m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION — Mr. J. A. Gotch, F.R.I.B.A., on "Architecture of the Eighteenth Century in England."

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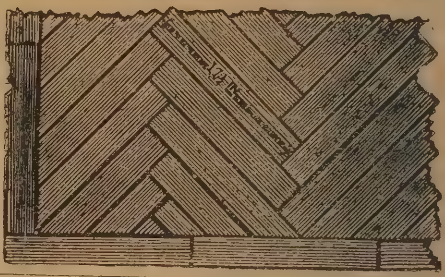

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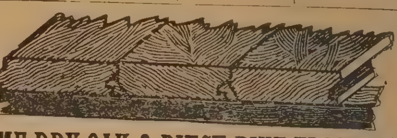

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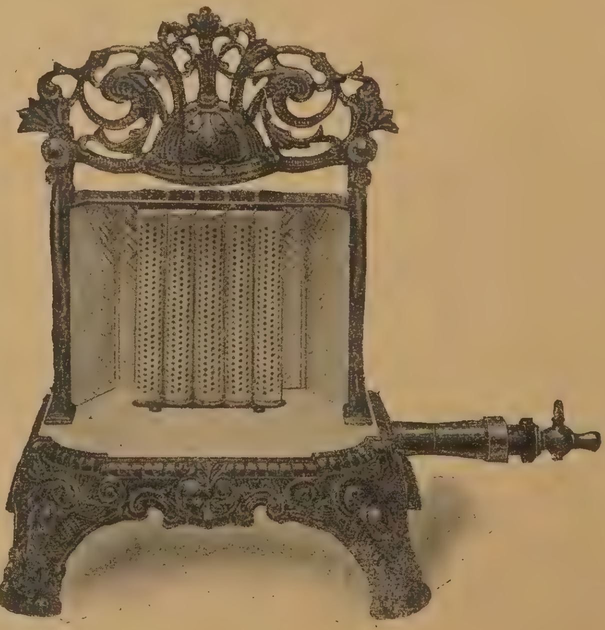

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

Nov. 20, 1901.
No. 354.

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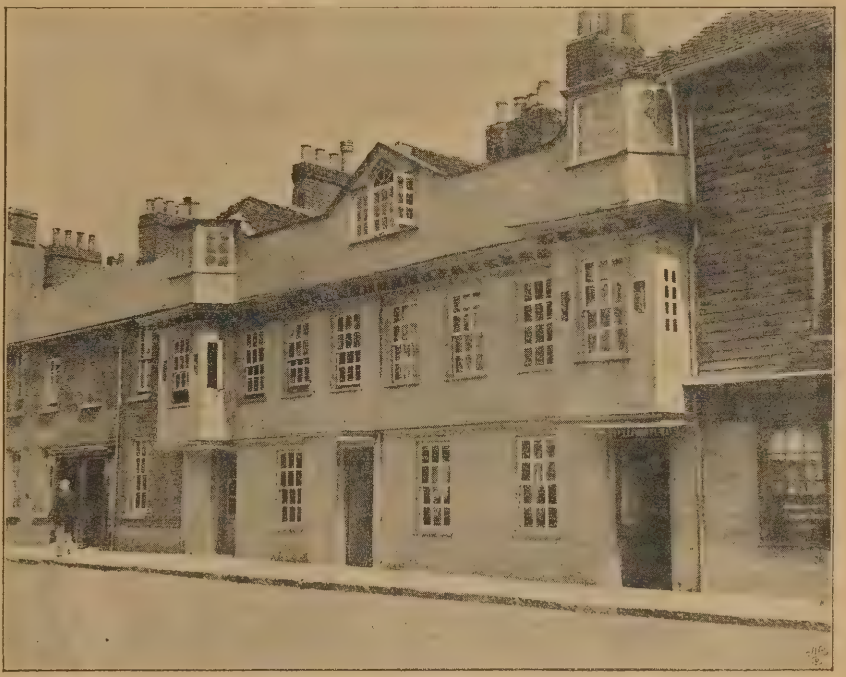
Take Note. OUR attention has been called to a most audacious proposal in connection with the competition for a new art school at Hull (particulars of which are given in the list of "Competitions Open" published on another page). Without any request or communication whatever, a certain firm of North-country architects received a letter from an individual at West Dulwich stating that his usual mode of working in connection with competitions was to prepare all the necessary designs upon the understanding that he was allowed about half-value of his time, half or third of any premium taken, and 1 per cent. on the contract amounts. "It is, of course, difficult for me to define any exact sum unless I have the 'particulars.' Will you kindly let me see these? Assuming an average number of drawings to an eighth scale, I think I should want about twenty guineas. I should certainly expect a combination of your superior local knowledge and my special experience to lead to a win if justice is done. The drawings would be submitted in your names alone, I presume." Such was the proposal made to this firm of architects. In reply to it, the chief partner wrote that the impression given to anyone into whose hands the letter fell would be that the firm had been corresponding with this individual with a view to obtaining designs from him to be submitted under their own names. "While I have long been aware," continued the writer, "that there existed persons knaves enough to make such proposals to architects in practice, I have not yet been able to believe that there existed any architect fool enough to accept such a proposal." Just as certain "business" transactions are no less criminal than the theft of a loaf from a baker's shop, so this architectural forgery is only an aggravated form of the architectural "ghost." We give publicity to this case, not on account of its impertinent novelty, nor to point a moral on the baseness of the human kind, but simply to warn others of the gentleman from West Dulwich who is willing to sell his "special experience" after the manner of a charlatan. —Since the foregoing was written we have received from the firm of architects in question a further letter from this "expert" in which he says that his former letter was addressed to the wrong firm, being an answer to an enquiry. Then follows much vulgar abuse, which it is not our desire to print, concluding with the remark that it is an unhappy reflection for him to see no superior central or administrative power invested with ability "to weed out ignorant and incompetent blackguards." In our opinion the whole thing is a fraud. We do not believe that this gentleman—who has such tender susceptibilities, though he uses the language of Billingsgate—did write in reply to an enquiry by another firm, and our belief is strengthened by the fact that his first letter (not the envelope only) was addressed to the firm of architects in question. It is not likely he would mistake the names and addresses, and send the letter to a firm with whom he had had no previous communication, and who, moreover, are scores of miles from Hull. So that it is fairly certain we have found a rogue here. We would not doubt so honourable a gentleman, yet we cannot conclude without observing, with regard to his qualifications as an architectural expert, that we have failed to discover any trace of his being an "architect" even. But this, of course, is only a minor matter.

Underground Trams. UNDERGROUND tramways are new to this country, though they can be seen working in Boston or Budapest, while New York, Berlin, Paris, and other cities, have lines in course of construction. The London County Council now propose to adopt them, and will apply next session for Parliamentary powers to construct an underground tramway under the new street from Holborn to the Strand, terminating on the Victoria Embankment at one end and in Theobald's Road at the other. The cost is estimated at £282,000. As the system is not generally known here, it may be well to state that the trams are run in a rectangular subway, the roof of which (supported on steel beams) forms the bed of the street. The actual distance from the bottom of the New York subway to the street level is only about 15ft., and at Budapest it is not more than 12ft. The temperature in these subways is about the same as that outside, and abundant light can be admitted through the ground-glass covers of stations and at gratings and street refuges. As to speed, the New York subway has four tracks, the middle pair reserved for trams running about 35 miles an hour, with stations over a mile and a half apart, while the remaining two are for trams travelling about 14 miles an hour, with stoppages every quarter of a mile. The system is an admirable one, and will doubtless prove a most satisfactory solution of the street-traffic problem in London. There are, of course, difficulties to be overcome. The network of existing pipes and sewers involved will cause much trouble. For example, the cross-sewer beneath Holborn is 4ft. 6in. high, exclusive of 18in. of brickwork, and is 10ft. 9in. below the surface, so that there is no room to pass over it, while its diversion will be no easy matter. Though the statement is made that in Boston and New York no material inconvenience was caused while the lines were being constructed, it is fairly certain that traffic will be disturbed for a time at the ends of the new street. However, these things must be. Afterwards will come the benefit of being able to travel rapidly and comfortably across the heart of London, instead of being jostled in crawling 'busses or financially ruined by cab-drivers.

Old Houses at Salisbury. THE illustration on this page of the charming old houses at Salisbury is from a photograph which has been kindly lent to us by Mr. Ernest Emerson.



OLD HOUSES AT SALISBURY.

The Ancient Lights Case. The appeal case of *Warren* v. *Brown* (see p. 242) is the most important case affecting "ancient lights" which has been heard for some time, and should therefore be carefully noted. Authorities on this subject are so much at variance that the most recent decisions in the courts alone form any sound basis for determining the merits of particular cases. In this instance the question turned on what constituted substantial diminution of light to a building in Leicester which from 1860 to 1884 had been used as a boot and shoe factory, but has since been used as a hosiery manufactory. Owing to the delicate machines employed, the latter needs more light than the former, and when, two years ago, the defendant raised an old building on the opposite side of the street the light to the factory windows was diminished, though there was still enough for "ordinary purposes"—and that was the crux, for the plaintiffs claimed the "extraordinary" amount of light which they had formerly enjoyed. Mr. Justice Wright found that the plaintiffs' lights had been substantially interfered with, and assessed losses at £300, but he made an additional finding dismissing the action on the ground that there was still abundant light "for all ordinary purposes of inhabitancy or business." In other words, as Lord Justice Romer put it, Mr. Justice Wright seems to think that there is a sort of standard in the matter of light, and that if a particular house is extremely well lighted by its ancient lights, these may with impunity be substantially interfered with so long as the house does not fall below the standard. The Court of Appeal think this is an erroneous view of the law. They therefore decided in favour of the plaintiffs, damages to be assessed and costs to be paid by the defendant. In the case of *Kelk* v. *Pearson* (L.R., 6 Ch, 809) Lord Justice Mellish said: "I cannot think that it is possible for the law to say that there is a certain quantity of light which a man is entitled to, and which is sufficient for him; and that the question is whether he has been deprived of that quantity of light. It appears to me that it is utterly impossible to make any rule or adopt any measure of that kind. It is essentially a question of comparison, whether by reason of deprivation of light the house is substantially less comfortable than it was before." The Court of Appeal consider this to be the accurate statement of the law and have upheld it, and in doing so they get rid of the very great difficulty of standard adopted in Mr. Justice Wright's judgment. This clearly defines one point, but it only tends to emphasise the necessity of either abolishing altogether such contentious privileges as "ancient lights" or so modifying them that they cease to be incessant matters of controversy.

THE COWL TESTS.

IN this much-criticised and, one may fairly say, much-abused report,* we have the result of about twenty-three years' labour of a committee of sanitary experts, led by the late Mr. Rogers Field, and aided by a staff of assistants. It is not surprising that in so long a period the hand of death removed one after another of the committee, until Mr. Field was left alone, with failing health and the work still incomplete. In this condition it was handed over to the Council of the Sanitary Institute who, not relying upon their own judgment, called in Professor W. N. Shaw to advise them, firstly, whether the information collected was worthy of circulation, and, this being answered in the affirmative, to supervise the final completion and publication. In the 250 pages of the report we have the chief facts (and some of the inferences derived from them) of a most elaborate series of about 9,000 experiments on the action of the wind upon air-meters, tubes and terminals. The original idea was to test the efficiency of various cowls, hence the term "Cowl Committee" which has been applied to the investigators, but it was soon found that it was necessary first to test the means by which that efficiency was to be measured. Even then the Committee was working in the dark as regarded the essential conditions for securing accuracy, and with the best intentions to proceed intelligently the experiments amounted to thousands before some of the first principles were ascertained. Among the historical notes a letter from M. Charles Joly to Mr. Field in 1879 has this notable sentence: "The cowls you experiment with are nothing else but *paravents* [screens]; some of them may act well, like plain open pipes, in case of a strong wind, but are actually worthless, and, I say more, prejudicial, in case of calm weather, when you mostly want ventilation." In his reply to this communication Mr. Field stated that the primary object of his research was the investigation of the induced current produced by the wind in ventilating tubes. He says: "We intend to measure the velocity of the wind, also the corresponding velocity of the up-current, and ascertain, if we can, what relation the one bears to the other. This, as far as I know, has never yet been done. We are at present engaged in testing our air-meters and anemometers, so as to obtain a reliable standard on which to work. The result of these experiments, as far as they go, shows that these instruments, as ordinarily used, are not to be much relied upon, and if we do nothing more than obtain correct data with reference to them I think we shall be doing good service to the science of ventilation." On looking carefully through the report there appear to be many points open to criticism and the total result is certainly disappointing, but an unbiased reader must come to the conclusion that an honest endeavour has been made to arrive at accurate practical results, and Professor Shaw says (p. 344), "although the numbers obtained for the ratio of the flow along the pipe carrying the cowl to the flow without the cowl give us nothing that can be regarded as a constant for the cowls, and consequently the use of the term 'efficiency' to denote the ratios obtained is appropriate, the experiments in themselves give a great deal of information of great value." There is however a want of scientific method; the test of accurate experiments is that gradual modifications should produce graduated results, and where any break in the continuity of the results occurs it is essential that the investigation should be prolonged until the cause for the break is found. No such perfect continuity is visible in the tabulated results; in many cases they are erratic, and the variations are so great that no general law seems to be discernible. The experiments as a whole appear to be wanting in precision, too many points having been followed up without preliminary matters being sufficiently determined. Professor Shaw's introductory note to Part V., "Experimental Results for Terminals and Cowls," gives the pith of the whole subject and emphasizes the weak points. Some of the terminals designed by the Committee gave results greatly exceeding those of plain pipes or other terminals in efficiency, and have been made the subject of patents, presumably for the purpose of preventing a monopoly, as of course the position held by the Sanitary Institute would preclude it from dealing with them commercially; and whatever may be the final verdict upon the report the public are the gainers by the mass of information laid before them. Naturally, some of the manufacturers will be disappointed that their cowls have not been placed first, but they have no reason to doubt the *bona fides* of the experimenters. Possibly other conditions would have produced other results, and it is a matter for regret that the Committee was not a more representative body.

CHICHESTER CATHEDRAL.

Appeal for Funds to "Repair" it.

THE general committee for the repair and restoration of Chichester Cathedral have determined to publish the report of the late Sir Arthur Blomfield, A.R.A., on the state of the Cathedral, and to issue an appeal for funds to commence the necessary work and to continue it until its completion. The report, which was almost the last work of that eminent architect before his death, endorses the opinions expressed in the previous reports of the late Mr. Gordon M. Hills and of the late Mr. Pearson, R.A., as to the serious nature of the repairs that are immediately and urgently required. The execution of these repairs has been delayed through the paramount necessity of rebuilding the north-west tower, with a view to securing the vaulting of the west end of the nave. The collection of the necessary funds and the execution of that work have occupied about seven or eight years, but the tower is now completed, "and has added greatly both to the stability and beauty of the Cathedral, inside and out."

In the meantime the process of decay has gone on, and the repairs enumerated in the three successive reports of the architects named above have become more and more pressing.

It is expedient to carry out the several portions of the work in well-defined sections as opportunity occurs. The order in which the various sections will be taken must be decided later, when it is known what funds will be available. "The object will be to preserve the features of this ancient building in all the beauty and grace which were given them by the builders of old time that has so long gone to their rest."

A legacy of £500 from the late Mr. France, a munificent benefactor of the Cathedral, provides for the west porch and entrance; but beyond this there are no funds available.

What the sum ultimately required will be it is hardly possible to state at the present time, but the cost of complete repair could not be safely calculated at less than £30,000. The works described by Sir Arthur Blomfield as urgently needing speedy attention may be reckoned at £15,000.

THE MODERN ARCHITECT.

THE opening sessional meeting of the Northern Architectural Association was held on Wednesday last at Newcastle, the chair being occupied by the president, Mr. Frank Caws, F.R.I.B.A. A letter was read from Mr. William Glover, F.R.I.B.A., past-president, submitting his resignation as a member of the Council owing to ill-health. The president and Mr. A. B. Plummer joined in expressions of regret at Mr. Glover's impending departure, and the hon. secretary mentioned a proposal to entertain Mr. Glover to dinner or to present him with some token of their esteem.

The president then delivered his inaugural address, in the course of which he said: The nineteenth century will be distinguished by the future architectural historian as the most fickle century of all in regard to the number, variety and incompatibility of the styles and fashions of buildings which it has so restlessly and inconstantly first embraced and then spurned. "As dead as Queen Anne" is an expression which has passed into a common by-word; yet it is remarkable that if there is any distinguishable survivor of the architectural fights of the great Victorian age it is the Queen Anne type, which still possesses much vitality, and seems to enjoy a fair prospect of extending its influence far into the twentieth century.

Though it is best for every architect to work in the style which is most congenial to him, yet, consciously or not, we are all deeply influenced by one another. The mind of the modern architect is as the basin of the sea, into which all the rivers of the past ages of architectural styles run; and it will not be strange, but quite natural, if this commingled ocean of ideas should present ultimately a glorious cosmopolitan expansiveness of majestic thought as the outcome of all its agitation.

Regarding the future of British architecture, we need not ask "what will the end be?" For there will be and can be no end to the mutable fashions affected by restless humanity. Signs are not wanting that the rising generation of architects, to whom the twentieth century belongs, are coming to regard an intimate acquaintance with structural principles as a *sine qua non* of professional proficiency; for not merely statics, but also dynamics, are now included in the curriculum of the preliminary examinations which even novitiates must pass ere they can take rank merely as students of the Royal Institute of British Architects. This remark naturally introduces the one subject which at the beginning of this new age holds the field more than any other—education. The education which in the centuries past was given to polish a man into a "gentleman" has in this twentieth century entered on a new career, with the nobler aim of teaching gentlemen to become workmen. In this new order of education architects, of all men, can least afford to be left behind. The truly successful modern architect must of necessity be an artist, scientist and commercialist, and withal an excellent society man, all rolled into one. To those among us to whom emphatically the twentieth century belongs, it is neither too late nor too soon to set before ourselves these three component qualities—art, science, business—and to make up our minds which of the three we will worship most and follow hardest; or whether we will strive for that highest ideal, and most honourable because most difficult of attainment, in which a deep love of art, familiar knowledge of science, and strict attention to business are combined in the fully-developed, every-way-qualified, up-to-date architect. The youngest among us, in view of these four alternatives, should act on Goethe's advice: "Choose well! Your choice is brief and yet endless!"

The popular measure of success is not supreme technical skill, is not even genius itself, but is gold. This debasing influence reveals its presence amongst us by an increasing disposition to bribe clients to employ us, by offering our services at rates of remuneration below the rates fixed by usage. To what extent these nefarious practices obtain amongst architects it is not easy for the clean-handed to discover. But it is certain that amongst building contractors of good standing and honourable character the acceptance by some architects of secret commissions engenders suspicion and lack of respect, which tend to lower the moral status of our profession and do it harm to an extent unknown and quite incalculable. The occasional offers of secret commissions to architects who decline them reveal the unpleasant fact that all architects do not decline them. One of the best results of the formation and maintenance of the Royal Institute of British Architects and its kindred provincial associations is the promotion of those individual friendships between fellow-architects which are the best practical guarantee for uniformity and clean-handedness of practice; while another way in which the power of association has proved peculiarly helpful to the rising generation of North-country architects is in the acquisition of our grand library, that veritable Golconda of architectural wealth. Surely we should fix on the entablature of the chief book-case a small silver plate permanently recording our indebtedness to our good friend Mr. Charlewood for devoting so many years to that splendid library.

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* Report on the work of the Committee appointed by the Sanitary Institute of Great Britain to practically test ventilating exhaust cowls. (Journal of the Sanitary Institute," vol. xxii., part iii., October, 1901.)

These are days in which originality is much (perhaps too much) sought after in architecture, as in art generally, and also in literature. But originality, as Sir Joshua Reynolds was never tired of reminding Royal Academy students, is the outcome not of ignorance but of knowledge of what others have done. Certainly the architect who neglects the library is (other things being equal) the least likely to develop originality worthy of the name; for, paradoxical though it may seem, originality is undoubtedly brought to birth by education breaking the fallow ground of the intellect. We need to exercise in architectural taste that same exquisite sense which the Greek possessed. The best architecture is that which makes us feel most and say least.

Bricks and Mortar.

APHORISM FOR THE WEEK.

How very grand it is, and wonderful,
Never have I beheld a church so splendid!
Such columns, and such arches, and such windows,
So many tombs and statues in the chapel.
LONGFELLOW.

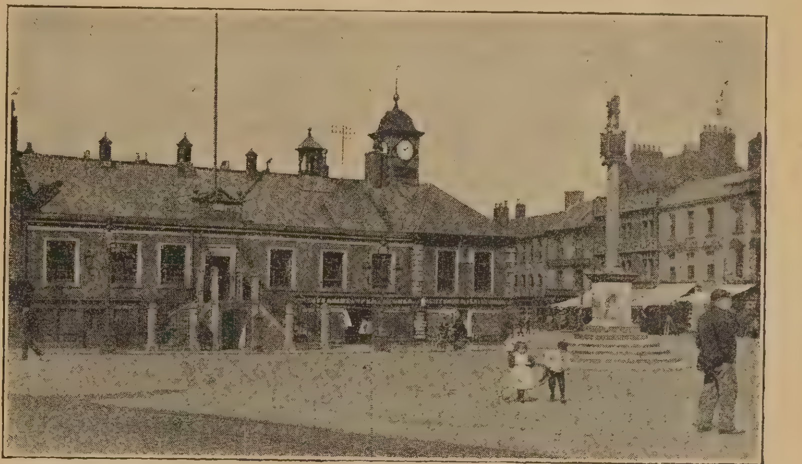
Our Plates. THE buildings of the Royal Infirmary, Glasgow, being quite out of date in their arrangements, are soon to be pulled down and an entirely new group of buildings erected from designs by Mr. James Miller, of Glasgow, whose plans have been selected from those submitted in a limited competition. Of the present buildings the only portion of architectural interest is the front block, of which the drawings in this number show the façade. This facade faces Cathedral Square, and was opened in 1794. It was designed by Robert Adam, the architect, and is a very good example of his work. Although it has little ornament and is very simple in its design, its treatment is quite characteristic, with its three-light semicircular arched windows and its small central dome. Great efforts have been put forth to preserve this facade in its present position, but it is feared it will be entirely cleared away, to the loss of the architecture of Glasgow. The measured drawings are by Mr. D. B. Hutton, who is an architectural student of the Glasgow and West of Scotland Technical College.

Repair of Linlithgow Palace. THE ancient royal palace of Linlithgow is kept in repair by the Crown representatives in Scotland, H.M. Woods and Forests. For some years past a sum has been allowed in the Government estimates for the upkeep and preservation of ancient royal residences, and with this money good work has been done. Recently workmen have been engaged repairing and pointing some of the more needful parts of the old building. In particular, attention has been directed to the wall on the north side of the quadrangle, and the apartments known as Queen Mary's room and the priest's residence. In these apartments the old lintels have been renewed and made more secure. The ancient fireplace in the Queen's room has been strengthened by the construction of an angular iron lintel, and similar repairs have been effected on an adjoining larger room to support the building above the window. In connection with the repairs at this time the Crown authorities have seen fit to erect a strong bulwark at the loch harbour, to prevent the water of the loch from making inroads on the palace grounds. In future years this work will probably be extended on the east side.

Edlingham Church. THE restoration of Edlingham Church, an interesting specimen of early Norman architecture, has been completed at the cost of over £1,000. The alterations and additions include new roof, an improved system of drainage, a new pulpit, a new lectern, new doors and new windows, although it should be mentioned that on account of the great historic interest attaching to the building, and because every stone is beautifully age-stained as well, it was decided to allow each window-opening to remain unaltered, so as to preserve as far as possible the historic memories associated with the church. The floor, which was raised 120 years ago above the bases of the fine Norman pillars, has been lowered to its original level. The nave has been roofed and ceiled with pine, as funds did not admit of oak being repeated. The new seating accommodation, however, is of oak. Mr. A. B. Plummer, diocesan surveyor, Newcastle, was the architect for the nave and tower; Messrs. Gradon & Son, Durham, the contractors; Mr. W. D. Caröe, of London, the architect for the chancel, representing the Ecclesiastical Commissioners, who are responsible for that part of the scheme, and who have executed that portion at their own expense. Mr. Percy Appleby, Newcastle, has been responsible for much carving in connection with the scheme. There has also been placed in the west wall a small mural tablet, of dark-grey polished granite, to the memory of the Rev. Matthew Henry George Buckle, incumbent of the parish, from the studio of Mr. Thomas Watson (D. McMillan & Co.), monumental sculptor, Alnwick.

The Date of Stonehenge. THE date of the building of Stonehenge has been put down to various ages. But it is only since the raising of the immense monolith to an upright position recently that the period during which it was built can with any certainty be assigned. During the excavations for the concrete bedding a large number of neolithic stone implements were found, showing every sign of having been used to cut and square the stones. They had evidently been much used, and when blunted were thrown aside and afterwards used as supports for the stone. There can be very little doubt that Stonehenge was built before the Bronze Age, for stone implements would not have been used had bronze tools been available. The tool markings on the lower part of the stone confirm the hypothesis, and from this it is concluded that Stonehenge was built before 1500 B.C.—Various antiquarian and other societies have communicated with the clerk of the Wiltshire County Council protesting against the enclosure of Stonehenge by a fence of barbed wire, and against a charge being made for admission thereto. The county and district councils are appealed to in order to vindicate the public rights.

An American Opinion of Mr. Brooks. "THE AMERICAN ARCHITECT" considers the late Mr. James Brooks was one of the ablest of modern English architects. "We well remember our first visit to England many years ago, when the top rounds, let us say, of the architectural ladder of fame were occupied by Waterhouse, Street, Scott, Norman Shaw and James Brooks. Naturally, our attention was particularly given to the works of these great artists, already familiar to us from the illustrations in the English professional periodicals. Street's buildings seemed to us just like the drawings, neither more nor less interesting; Norman Shaw's executed work was inferior in attractiveness to the drawings, which leant to it, in many cases, a poetry and picturesqueness which it did not possess in execution; while James Brooks's churches were far superior in charm to the drawings. In the grouping of great masses of wall, whether in brick or stone, even Street was hardly equal to him; and his buildings, so far as we saw them, seemed to us to combine originality and power with affection for ecclesiastical precedent to a degree in which he was rivalled only by Street. When it is remembered that the time of Brooks's activity was also the period of polychrome architecture, when rows of little enamelled tiles were thought to be the correct thing in connection with brick cornices, his boldness in using masonry in great masses seems all the more remarkable, and his work is, in consequence, of particular value to the student."



THE MARKET-PLACE AND TOWN HALL, CARLISLE.

The Town Hall, Carlisle. THERE is a feeling of incongruity about the aspect of the town hall in the Border City, as the visitor looks around and finds modern surroundings on every hand. The late Bishop of London says in his monograph on Carlisle in the "Historic Town" series: "The main streets converge upon the spacious market-place, which followed the triangular shape of the old town, and by its spaciousness bears witness to the importance of Carlisle as a market town. In the middle of it stands the old market cross; and on the north side stands the old town hall, a plain building of the middle of last century (*i.e.*, the eighteenth), showing by its modesty the humility of the burghers of Carlisle at the time when it was built. It is a strong proof of the good sense of their successors that they have resisted the temptation to replace it by a more pretentious structure, and are satisfied with adapting to their present needs this interesting memorial of a homely past." The market dates from the early days of the fourteenth century, if not earlier. The illustration on this page is from a photograph by Mr. F. J. Pape.

ST. EDMUND'S SCHOOL, HINDHEAD, SURREY. NEWMAN & NEWMAN, ARCHITECTS.

Law Cases.

Non-Fulfilments of Contracts: An Aberdeen Case.—Sheriff Henderson Begg has issued his interlocutor in the action of George Duguid, builder, of Aberdeen, against the proprietors of the Station Hotel, Aberdeen, for the balance of his account of the building contract for the Station Hotel. The defence was that the building was not completed within the specified time, and that consequently the defendants lost money. In a letter dated January 21st, 1899, and written to Mr. R. G. Wilson, the defendants' architect, the plaintiff agreed to execute the masonwork of the hotel for £3,879. The specification stipulated that the walls were to be ready for the roofs by July 1st, 1899. The defendants did not accept the plaintiff's offer till February 25th, 1899, so that it was then impracticable to have the walls ready for the roofs by July 1st; in fact, the plaintiff was not put in possession of the ground till May 5th. The sheriff decided in favour of the plaintiff, and ordered the defendants to pay his claim of £688 4s. 10d., with costs.

Copyright in Trade Catalogues.—The case of *Ortzman* v. *Leferer* came before the Chancery Division of the High Court of Justice last week. This action was brought to restrain the alleged infringement of copyright in the plaintiffs' catalogue of furniture. This catalogue is illustrated by special sketches made by an artist, and the plaintiffs found that out of 180 illustrations about thirty-two had been copied by the defendant. They therefore brought this action. Mr. Justice Eady gave judgment for the plaintiffs, granting their injunction, with costs.

Flats and the Smoke Nuisance.—The appeal case of *Queen Anne Residential Mansions and Hotel Co.* v. *Mayor, &c., of Westminster* was recently heard. The building in question which caused the smoke nuisance consisted of 300 sets of residential chambers, or flats, none of which were provided with a chimney, there being a general kitchen. In the basement there were five boilers, used for generating steam, for cooking in the kitchen, for warming the building, for generating electricity, for lighting, and also for the laundry. The boilers were connected with a chimney 168ft. high On behalf of the appellants it was contended that no offence had been committed under section 24 of the Public Health (London) Act, 1891, the chimney being the chimney of a private dwelling-house. The Lord Chief Justice considered that in truth a large trade establishment was carried on, and he thought the decision of the magistrate, inflicting fines of £5 and £5 5s. costs in one case and 10s. in each of two other cases, was right. He was therefore of opinion that the appeal should be dismissed. The learned judges concurred, and the appeal was dismissed, with costs.

Re C. G. Crowden.—An adjourned first meeting of creditors was recently held under the failure of Charles George Crowden, builder and contractor, of Westbourne Bridge Wharf, Paddington. A proposal providing for the payment of a composition of 10s. in the £ to the creditors, claims for £48,261 being withdrawn, was not accepted by the meeting, and a resolution for bankruptcy was accordingly passed. Mr. F. W, Davis, chartered accountant, was nominated as trustee to wind up the estate, with the assistance of a committee of inspection. The debtor returned his liabilities at £48,981, of which £4,952 was expected to rank, and estimated assets £13,969.

Fireproof Staircases: L.C.C.'s "Impossible" Requirements.—In the King's Bench Division of the High Court of Justice last Wednesday the case of the *Consolidated Properties Co.* v. *Chilvers* was heard against a conviction on the prosecution of the London County Council for non-compliance with an order of the Council to provide a fireproof staircase communicating with all the floors of the appellants' premises in Queen Victoria Street, so as to provide means for the safety of workpeople. The County Council notice required a new staircase to be erected from the ground to the top storey, communicating with each floor in a particular way. But the difficulty experienced by the appellants, who were anxious to comply with the order, was that the ground-floor and basement of the premises were let to tenants who were not using them as a factory, and who declined to allow the appellants to interfere with those floors. It was therefore impossible to comply with the order. The Metropolitan magistrate who heard the case at the Mansion House refused to hear evidence on the point, and convicted the appellants, saying that the question whether the appellants could or could not comply with the order should have gone to arbitration. The appellants accordingly submitted the question to two experts, who recommended that a single outside staircase be brought down to the ground floor, and then the two inside staircases be utilised and made fireproof; that all doors should be made to swing both ways; and that all gangways and passages be made clear. Mr. Justice Bingham said that in his opinion the appellants had been convicted for not complying with a notice with which it was impossible to comply. Therefore the conviction ought to be set aside; but as the appellants ought to have asked for arbitration before the matter went before the magistrate at all they ought not to have costs. Mr. Justice Ridley concurred. The appeal was accordingly allowed and the conviction quashed, but without costs.

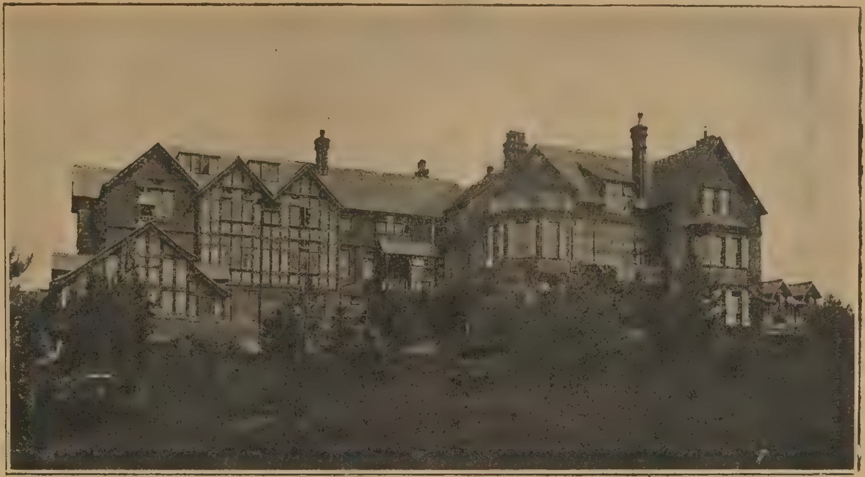
Ancient Lights: Important Appeal Case.—The case of *Warren* v. *Brown* came before the Court of Appeal last Wednesday. The appeal was from an order of Mr. Justice Wright dismissing the action which was brought to restrain an alleged interference with ancient lights. The question raised upon the appeal was whether the right acquired by statutory prescription to ancient lights was a right to the continuance of substantially the whole quantity of light which had come to the windows during the twenty years, or whether it was limited to a sufficient quantity for all ordinary purposes of inhabitancy or business. The plaintiffs' premises, which were situated at Leicester, were formerly used as a boot and shoe manufactory, but during a period of less than twenty years for the manufacture of hosiery, for which it was said delicate modern machinery was employed requiring exceptional light. On the north side of the street facing the plaintiffs' south window the defendant had raised a building from 20ft. 6in. to about 26ft., but had set it back 2ft., increasing the width between the two buildings from 17ft. to 19ft. It was held in the court below that the light had been materially diminished, but that abundant

CHAPEL AT ST. EDMUND'S SCHOOL.

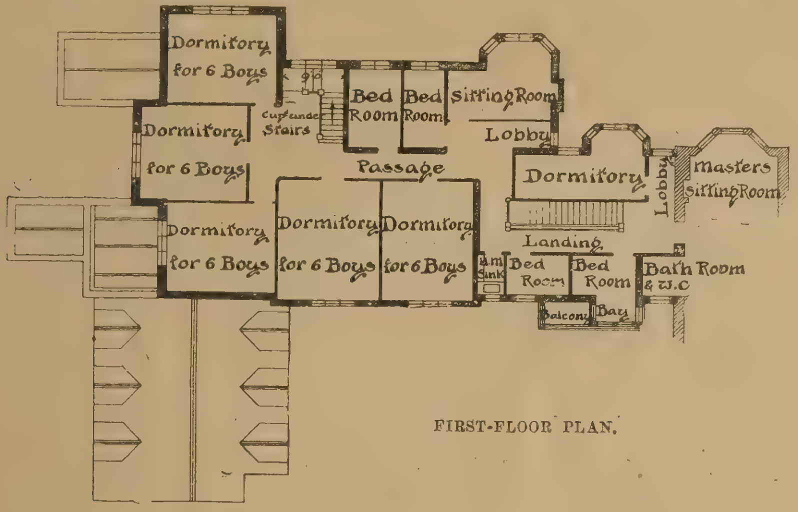
light remained for all purposes of inhabitancy or business. Judgment was given upon that finding for the defendant, with costs, but the learned judge assessed damages, in case he should be wrong in his view of the law, at £100 for the tenant and £200 for the reversionaries. The Court of Appeal held that if ancient lights were interfered with substantially and real damage resulted, the persons injured were entitled to relief. They accordingly allowed the appeal, and ordered judgment to be entered for the plaintiffs for the amount assessed, with costs. (A leaderette on this case appears on p. 239.)

MR. PAUL WATERHOUSE ON ARCHITECTURE AMONG THE MODERN ARTS.

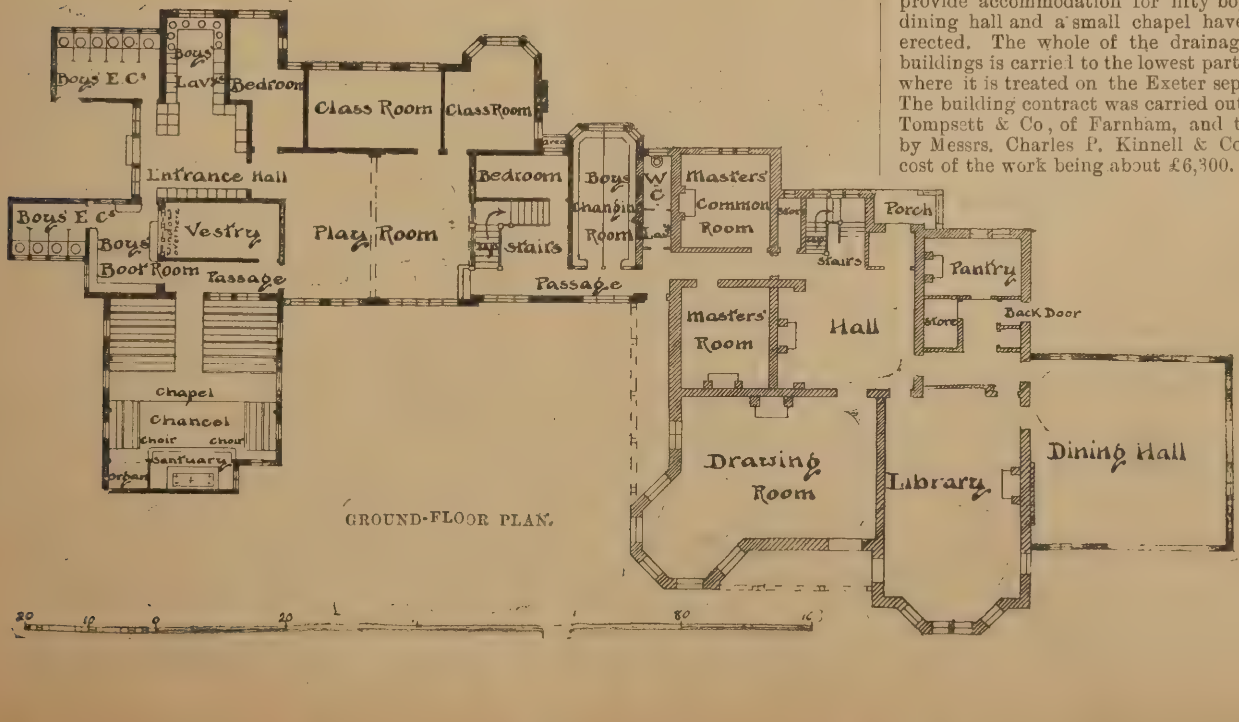
A MEETING of the Manchester Society of Architects was held on Thursday last, Mr. Alfred Darbyshire presiding. There was an exhibition of students' drawings, and the following prize-winners were announced: Design for a small plunge bath, Mr. Gerald Salomons; for the sketches in connection with the summer visits, 1st, Mr. Frank Osler; 2nd, Mr. Gerald Salomons; for measured drawings, 1st, Mr. Claude Paterson; 2nd, Mr. Gerald Salomons. Mr. Paul Waterhouse afterwards read a paper on "Architecture among the Modern Arts." He said he took it to be an axiom that the greatest periods of historic art had been those in which there was no consciousness of art; that, in fact, consciousness in art was a danger to its existence. Our age was above all an age of expression, and in architecture especially the powers which made the critic were, he thought, allied to those which made the producer. In fact, the very mental exercises that enabled us in these days to define and detect that essence of art which was unnameable to our forefathers were not necessarily destructive of creative skill, but might be turned, at least so far as architecture was concerned, into the instrument of a riper, fuller and more intellectual creation. After speaking of the simplicity which underlay Greek art, the beauty of some of the best specimens of Roman architecture, and the last, buildings of the Italian Renaissance, which he said, breathed the very essence of art, the speaker emphasised the fact that art as we understood the word was never talked about by their builders. In the great Gothic days the mason was a skilled craftsman who was imbued with a simple pride in his work, which was to him an expression of pious faith and Christian belief; but the mason would have been quite unable to talk about his work. Until the present age, art was cherished and beloved, but never talked of. To-day an unconscious selection was exercised, but all noble work had its traditions in recognized styles, and was more or less the result of an academic choice. No architect to-day could consider himself equipped for his work without a sound knowledge of the elements in which he worked. So far from being choked, as some argued, by a deeper insight, the architect must necessarily be a student. He attained the highest possible only when he could criticise his own work in the light of knowledge. Architecture was, so to speak, the application of taste to construction; therefore only the man of wide knowledge could be trusted to vary or modify the old rules, since his power to judge depended upon his knowledge of the work of his predecessors. Architecture was creative, and arose from the divine in a man. As its name implied, it was the queen of crafts; the architect was not an imitator, but a creator.



ST. EDMUND'S SCHOOL, HINDHEAD, SURREY.

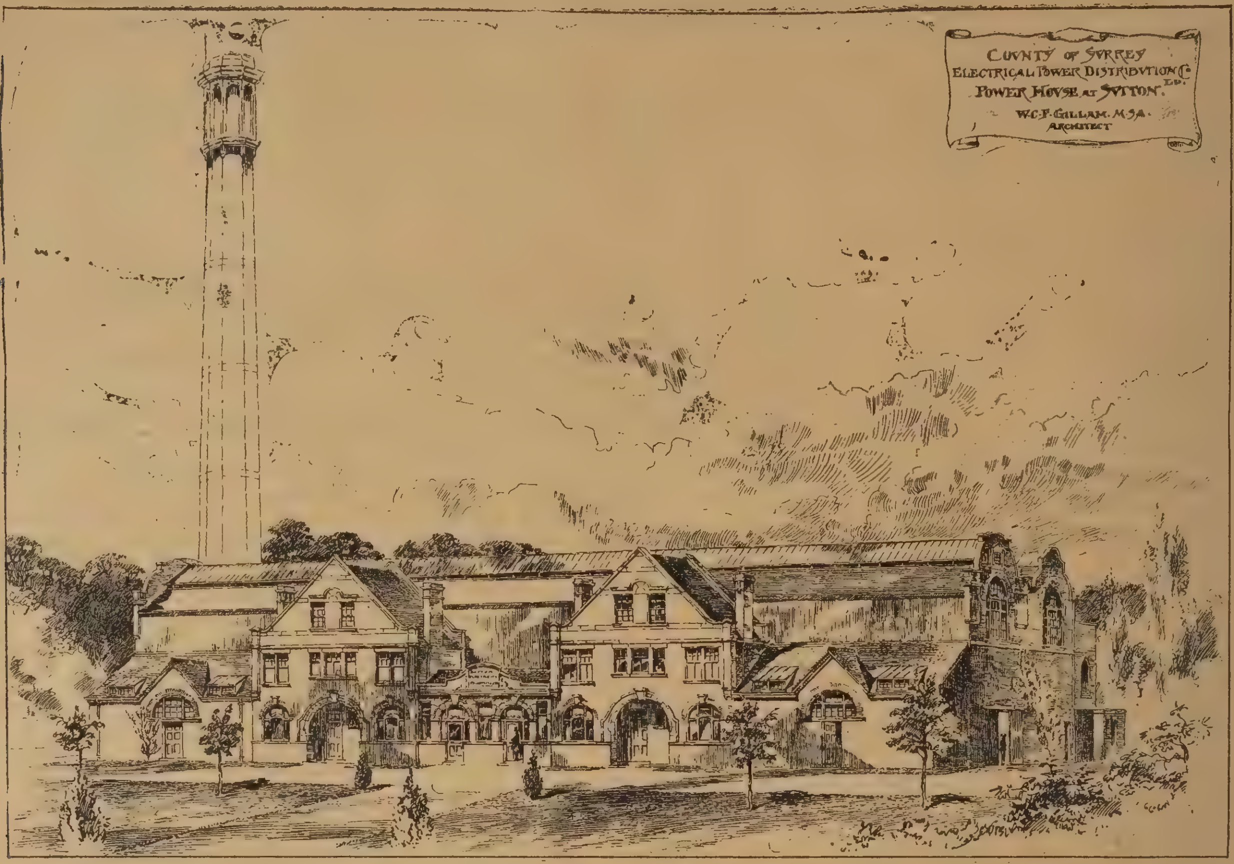


FIRST-FLOOR PLAN.



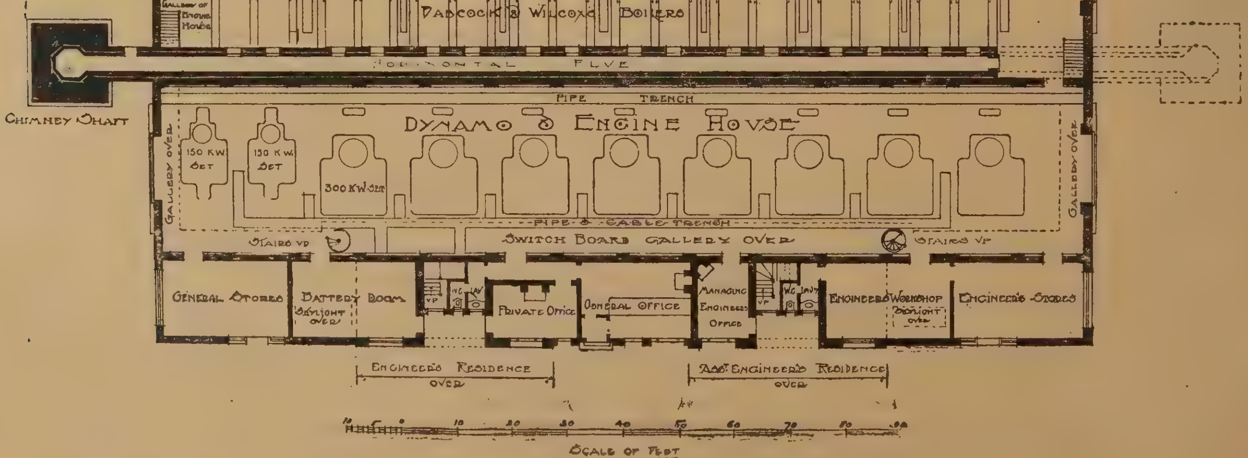
GROUND-FLOOR PLAN.

St. Edmund's School, Hindhead, Surrey.—These buildings, which have been erected from designs by Messrs Newman & Newman, of London Bridge, S.E., stand upon a beautiful site about 150ft. above sea-level, and command an unobstructed view of the surrounding country. The existing building, known as "Blen Cathra," has been altered and adapted to suite the requirements of a high-class school, and new buildings have been erected and connected with the existing ones to provide accommodation for fifty boys; a large dining hall and a small chapel have also been erected. The whole of the drainage from the buildings is carried to the lowest part of the site, where it is treated on the Exeter septic system. The building contract was carried out by Messrs. Tompsett & Co, of Farnham, and the heating by Messrs. Charles P. Kinnell & Co., the total cost of the work being about £6,300.


COUNTY OF SURREY
ELECTRICAL POWER DISTRIBUTION Co. Ld.
POWER HOUSE AT SUTTON.
W. C. F. GILLAM. M.S.A.
ARCHITECT

SUTTON ELECTRICITY STATION.

THESE works (the first portion of which is in course of erection) are being built for the County of Surrey Electrical Power Distribution Company, Ltd., and are situated on a site adjoining the south side of Sutton Station (L. B. and S. C. Railway). Electricity will be generated to supply the towns of Sutton, Carshalton and Wallington. The buildings are faced externally with red brick, and the roofs are slated. The engine-house is also faced internally with red brick, with a 6ft. 6in. dado of glazed bricks, whence start the piers supporting the track of an overhead crane. A continuous skylight of patent glazing and windows in the gable ends afford light. The roof trusses are of steel. The floor will be laid in marble mosaic. An iron cantilever gallery is placed on three sides of the engine-house at a height of 12ft. from the floor line, being a continuation of the switchboard gallery, the flooring of which is constructed of patent insulated glass. The chimney shaft is 135ft. high from the ground-floor line, and is octagonal on plan above the square pedestal. The footings rest upon a solid cement-concrete foundation 5ft. thick and 26ft. square. The natural foundation being rock chalk at a depth of 10ft. below the floor level, all walls and the engine foundations are carried down to it. The architect is W. C. F. Gillam, M.S.A., of Brighton.



Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Extensions to Local Sewers.

LIVERPOOL.—LOCAL writes: "A client of mine is anxious to build an expensive house upon an acre of land, fronting a main road in an urban district. The local board's sewer comes within 100yds. of the proposed new house, but the surveyor refuses to continue the sewer up to my client's plot of land. Can the local board be compelled to do so? If not, how is the drainage to be got rid of, as a cesspool is out of the question?"

You cannot compel the board to lay down a sewer in your road. You should ask the local surveyor for advice or get the adjoining owners to bear the expense with you. If you cannot compromise it is optional for you to either lay down the 100yds. of drain at your own expense, or adopt some other method. Cesspools are insanitary. We should think the council would act reasonably if approached properly. Refer to Mr. Max Clarke's paper reported in this issue.

Architects' Assistants' Materials and Instruments.

LANCASHIRE.—P. S. W. writes: "What materials and instruments are architects' assistants generally supposed to use on behalf of their employers?"

Drawing materials, drawing boards and T-squares are provided by the employer, but the assistant must provide his own instruments.

Improving a Water-Supply.

SHREWSBURY.—D. & D-L. write: "In a building we have erected the water is pumped into tanks in the roof by means of a small gas-engine, but this is found to be not powerful enough. The water is pumped from an underground tank fed from a public main having a head of water of about 10ft. above the ground level. It seems to us that the hot-water supply (which is the most important) might be greatly improved by connecting the main to the cold supply from cisterns to cylinder, with a small box on the main containing a flap or other suitable valve to prevent the water pumped into the tank from falling to the level of the head of water in the main. The idea is to get the water-supply directly from the main in conjunction with that from the tanks in the roof, thereby increasing the hot-water supply. Is this practicable?"

If the effective head of water in the main pipes is only 10ft., it is impracticable to connect direct to the hot-water supply, which has more than 10ft. head, even if the water company would allow it. Making the connection at a lower level to let the water run in is against the laws of hydrostatics. The only reasonable method is to increase the size of the gas-engine and roof-tanks. HENRY ADAMS.

Books for S.K. Examinations.

LONDON.—STUDENT writes: "What books would you recommend to study for the South Kensington examination in architecture?"

"A History of Architecture," by Banister Fletcher and B. F. Fletcher (B. T. Batsford, price 21s. nett); "A History of Gothic Art in England," by Edward S. Prior (George Bell & Sons, £1 11s. 6d. nett.); "Rational Building," a translation of the article on Construction in Viollet-le-Duc's Dictionnaire (Macmillan & Co., 12s. 6d. nett.); and "The Column and the Arch," by W. P. P. Longfellow (Sampson Low, Marston & Co., 10s. 6d.).

L.G.B. Model By laws.

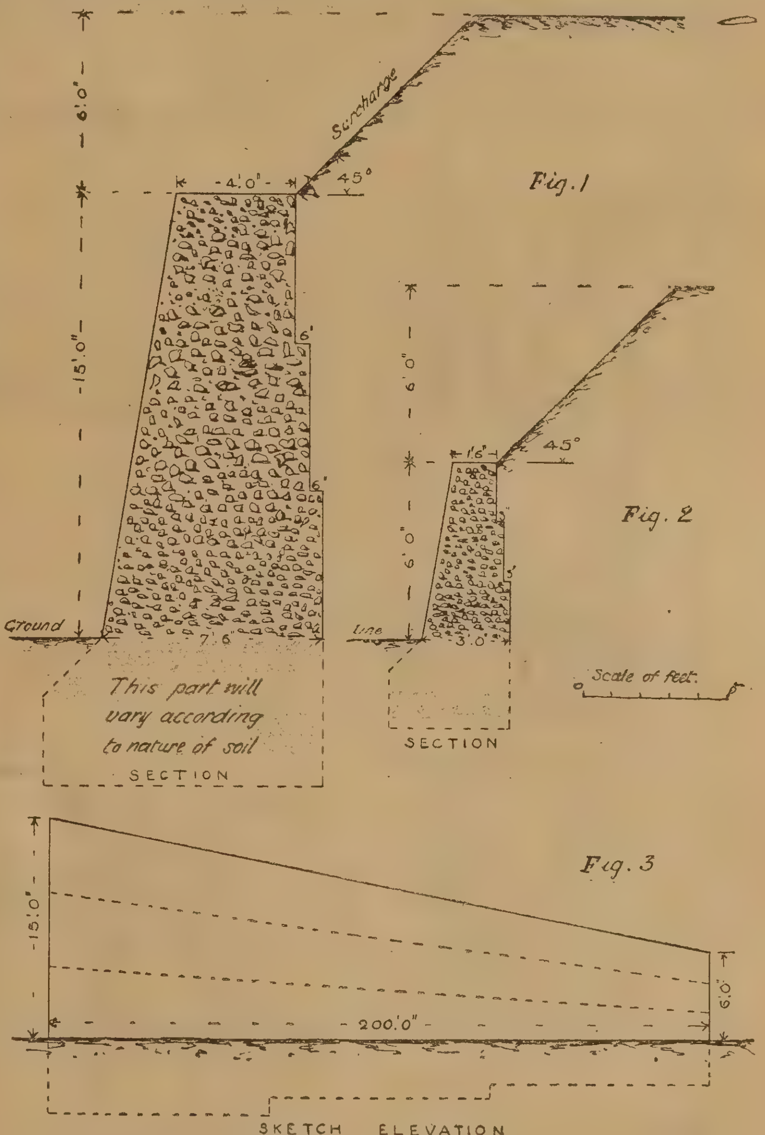
UPPER WARLINGHAM.—A REGULAR READER writes: "Where can the Model By-laws of the Local Government Board be obtained?"

From Messrs. Eyre & Spottiswoode, East Harding Street, E.C., and 32, Abingdon Street, Westminster, S.W.; Oliver and Boyd, Edinburgh; or E. Ponsonby, 116, Grafton Street, Dublin.

Concrete Retaining Wall.

BRISTOL.—EXON. writes: "A concrete retaining wall about 200ft. long has to be built. It would be 15ft. high at one end and 6ft. at the other end. The earth to be retained is of a moist vegetable character, and would be surcharged at an angle of 45 degs. Kindly give sections and method of construction. Please also say how the cost would compare with rough bricks in cement (Bristol district)."

The nature of the subsoil is not mentioned, nor the height of surcharge, and this will considerably affect the design, but the accompanying sections may perhaps suit the case if the concrete be carried down to a firm stratum as shown by dotted lines. Square weep-holes, 3in. by 3in., should be cored in the wall at the rate of 1 to every 4 sq. yds. of face area, or at greater intervals according to the amount of water percolating through the soil supported. The sketches show the sections at the two extremities of the wall, and a sketch elevation. The construction would be similar to ordinary concrete work, the mixture being say 1 Portland cement, 1 sand, 5 or 6 broken stone or ballast. The cement to be thoroughly air-slaked and all of one make and quality. The cost would probably be from two-thirds to one-half that of rough brickwork. The description does not say whether the top or the bottom of the wall is to be level; the latter has been assumed, but the dimensions will answer for either case. HENRY ADAMS.



CONCRETE RETAINING WALL.

Damage to Roof by Storm.

SURVEYOR writes: "Suppose a portion of a lead roof was torn up by the wind during a storm, would the contractor be required to make good the damage at his own cost, after the building was taken off his hands and the work passed by the Inspector of Works, if a clause was inserted in the schedule 'that the contractor must uphold the work for the period of one year after completion.' Does that include all risk of storms?"

Yes; the contractor would be liable to repair the damage at his own expense.

Designing Ironwork.

PORTSMOUTH.—C. F. S. L. writes: "Which is the best work on the practical designing of constructional iron and steel work, also of domes, cupolas, &c.? Where could I find how to obtain the 'resistance figure' and centre of gravity of any section, regular or irregular, both graphically and mathematically?"

"The Practical Designing of Structural Ironwork," by Prof. Henry Adams (7s.). A paper on domes by Sir Edmund Beckett (then Mr. Denison) will be found in the "Memoirs of the Royal Institute of British Architects," of February, 1871, and two shorter ones by Mr. E. W. Tarn in the "Civil Engineer's Journal" of March, 1868. See also Sir E. Beckett's "Book on Building," Lock's "Elementary Statics" (Macmillan & Co., 3s. 6d.), Hoskins' "Graphic Statics" (Macmillan & Co., 10s.), and Rankine's "Manual of Applied Mechanics" (Griffin & Co., Ltd., 12s. 6d.). These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Staircase Construction.

FILEY.—M. F. S. writes: "What is the best book on staircase construction?"

"A Treatise on Stairbuilding and Handrailing" by William and Alexander Mowat (George Bell & Sons, price 28s. nett).

R. I. B. A.

Mr. ANNING BELL ON MOSAIC.

A MEETING of the Royal Institute of British Architects was held on Monday evening last, Mr. William Emerson, president, in the chair. Mr. Alexander Graham, hon. secretary, announced the death of Mr. Frederick William Porter, district surveyor of Holborn and East Strand, elected a Fellow of the Institute in 1855. Mr. Robert Anning Bell then read a paper on "The Practice of Pictorial Mosaic." The following is a summary:—Mosaic had many advantages peculiar to itself, and also had very definite limitations. It was obvious to anyone who had studied the work of the past that the realistic representation of natural effects, although it had been sometimes remarkably near success, was not the way to get the greatest beauty possible out of the material. The material proclaimed itself at the outset as being unsuitable for realistic effects for two reasons. The first and strongest was the uniformity of its surface, which rendered it impossible to get that variety in the texture of the material which was the special reason why oil paint was so triumphantly superior to any other material in the rendering of the look of Nature; the second, the fact that it had to be applied in separate pieces, with an interval, however small, between them. The tints could not shade off into each other with quite the subtlety of paint, and the interstices formed a lacework of ground colour and shadow which was the same all over the surface, and added to the monotony of the texture. The material, therefore, commanded a certain flatness as the effect to be aimed at, and, as a corollary to this, a certain archaism or stiffness in the design. This very flatness of effect imposed some restraint on the style of the design. It was not truly archaic, but was the fullest expression which the limits of the material permitted, and gave an artist plenty of elbow-room for his invention if he had any feeling for the method. For pictorial mosaic the subjects chosen must be such as aré suitable to austere treatment. The play of facial expression or momentary gesture was out of court. The characters introduced could not be likenesses, or the occasion of their introduction a mere incident; the characters should be types, the incidents symbolic.

Discussing the practical questions of working and placing the mosaic, the author said that it should be some way from the eye, and a good deal higher up. Like many other good things, when you want it you want a lot of it; it is best of all when entirely covering a large space and unbroken by architectural mouldings. This applies more particularly to gold mosaic, which, when covering walls and domes, running round the arches, flashing into a glistening flake of light as it turns the corner, and covering every inch of space above the capitals of the columns, is much more satisfactory in effect than when used in juxtaposition with stout arch mouldings and pilasters. Small panels of mosaic, the author said, he did not like at all, even where they are merely filled with conventional foliage, though that is better than the clumsy look of small figures close beside the smooth and exact form of the mouldings which frame them.

In interior work, gold mosaic—a treatment, that is, in which gold is largely employed—seems to be infinitely superior in effect to a treatment in colours only. For external work the author considered the use of gold a mistake. First, from the practical side, owing to the construction of the tesseræ, it was likely to be damaged by frost, as the film of glass which covered the gold-leaf was very easily flaked off should any water get into the interstices, as it was sure to do; and secondly, from the æsthetic side, there was no mystery of shadow to bring out its peculiar beauties; it glittered so strongly in sunshine as to destroy the effect of the design of which it formed part, and it was inclined to look rather garish even in ordinary daylight.

Treating of colour, the author advised a light scheme of colour as preferable to a deep one. The cooler colours are pleasanter than the warm ones when used in any quantity. Much orange is peculiarly unpleasant, and even reds should be sparingly employed, and rather as accents to strengthen other colours than in masses for their own sakes. Blues and greens tell well at a distance; they have a charming quality, will keep their colour very fairly, though one needs to use a much stronger blue than might be expected if it is to be at all rich in effect. It may be taken as a general rule that differences of any light tints carry much further and tell much more strongly at a distance than similar differences in a lower key. In whites a very slight difference will have a very marked effect, and it will tell less close to than some way off, whereas quite the opposite is true of strong colours, particularly of red. Difference of quality in the glass has also a marked effect on its carrying power.

As regards tesseræ, very great differences of size are unadvisable in figure-work. A few large pieces among a lage number of small pieces is unsatisfactory. If, however, large pieces are mainly used, a few small pieces here and there will rather enhance the effect. As an interesting example of this, Mr. Beresford Pite's mosaic outside Pergami's Restaurant was cited. The effect is quite unlike what we are used to in mosaic, but the author would like to see more work done in this method. It has many advantages in a place like London. Dirt cannot easily settle on it, and when it does is easily washed off. It is permanent; and as the pieces are so large, less labour is required than with ordinary mosaic. For outside work the author found that a scale larger than was generally seen in old work might be used with good effect. Should varying sizes of tesseræ be used generally over the work, any place where they are kept of uniform size will infallibly attract the attention by its regularity; this would be seen in a pilaster forming part of the background of the panel at Horniman's Museum.

Careful study should be given to the size of the interstices. In background work they can be quite large if the colour is not wanted to be very pure, the dull tint of the putty toning down or saddening brighter colouring. In such parts as faces, hands or other details to which particular attention should be attracted, they may be quite close together, so making a comparatively solid mass of colour and giving emphasis to the part. In fact, it would be difficult to work a face without keeping the tesseræ close, as the tone of the interspaces would destroy the quiet modelling, which is all that is necessary or advisable.

Remembering the limitations of the material, anything like truth of relative values or strength in the general effect of light and shade should not be attempted. Simplicity in modelling is to be desired. Variety of tone is obtainable by the relative strength of the colours used in different parts of the design. Realism of texture in draperies or other accessories should be avoided; trees, buildings, clouds, textiles, &c., should be felt to be rather symbols of those things than actual representations of them.

The author then treated of various matters and difficulties connected with the actual work of putting the mosaic upon the wall. His preference was for the method of doing the work *in situ*; a good result cannot possibly be obtained by other means. The modern Italian way, which the author described, is open to the obvious objection that you cannot see the progress of the work, and it is impossible to make alterations as you go on, as the surface is too flat.

In translating the water colour or pastel tints of the cartoons into coloured glass, a good deal of variety is possible, so that it is necessary to be always in touch with the workers to discuss with them which tint and quality of glass shall be used, and sometimes to vary from the cartoon when the work already finished may suggest it. The setting of the mosaic is an essentially artistic craft; it is absurd of the designer-in-chief to say simply: "Here is my cartoon; take it and copy it exactly." It is impossible to copy it anything like exactly, and consequently complete co-operation between designer and craftsman or craftswoman—for it is one of the things that women do admirably—is absolutely necessary.

Though the most splendid, as it is the most permanent form of wall or ceiling adornment, mosaic is extremely arbitrary, and any attempt to stretch its limits is terribly punished. It will not easily put up with rivalry, and will not endure other methods of decoration in immediate juxtaposition. In interior work it quarrells with staired glass, and it destoys gilding, as may be seen in many a Roman church where the choir-arch and columns are gilt around an apse of mosaic. Outside, the mosaic must be made the dominant in the scheme of which it forms part. No colour can stand near it but in humble subordination, and its surface texture requires considerable art and discretion in the choice of neighbouring materials. Nobly used, it nobly repays; ignobly need, it does nothing but disgust.

Mr. George J. Frampton, A.R.A., in proposing a vote of thanks to Mr. Bell, said mosaic should be light in tone and flat, without strong black colours or tones, or it would look like a hole in the wall. Realistic treatment should not be used in decoration, and realism could not be used in a building; what was wanted in decoration was the mind of man, set forth in conventionalities.

Mr. Walter Crane seconded the vote, and Messrs. C. Harrison Townsend, T. R. Spence, George Bridge, W. Brindley, William Woodward, Edward W. Hudson, Thomas Blashill, Colonel Lenox Prendergast and Mr. William Emerson also spoke. Mr. Bridge said architects often assumed a depth of about 3in. was necessary for placing the mosaic, but, inclusive of cement (or putty) and tesseræ, it would not be more than 1in. thick. The putty was put on about ½in. thick and the tesseræ pushed in, squeezing it up between, and about ¼in. was finally left behind them. The chief basis of the putty he had used was lime and boiled oil, but the great thing was to see that the lime was old, say two or three years. The vote of thanks having been accorded, Mr. Bell replied, and the meeting then terminated.

CAMBERWELL'S MUNICIPAL DEPOT.

A NEW depot for carts and horses has been erected for the Borough Council of Camberwell in Grove Vale, by the side of East Dulwich Station. It is approached by a roadway 185ft. long, and is distant from the northern extremity of the borough 1¾ miles, and three miles from the southern boundary, which is at the Crystal Palace. It covers 1¾ acres of ground, of which the freehold was purchased in 1898 for £1,500, and encloses a small plot 29 poles in extent used for the storage of materials for road-making, &c. The total cost of the new buildings and machinery will be just under £30,000. The buildings, designed by Mr. Oxtoby, the borough engineer, have been erected by Mr. Holloway, of Deptford, and are throughout fireproof. They are in five blocks. The first of these contains a committee-room, a harness-makers' shop, store-rooms and offices, with a steam-roller house and two cottages for the horse tender and the storekeeper. In the next block is the greater part of the machinery. Here are workshops for wheelwrights, farriers, and smiths, and on the floor above rooms for painters and carpenters. In future the borough will make all its own wheels, and perhaps its carts. Then comes a large three-storeyed block in which the newest machinery cleans, cuts and mixes the food for the horses, dividing it up by weigh and putting each ration into a separate bag. In an hour and a half the food for 120 horses can be prepared. Close by, over the yard, is a large platform, to be used to store timber, &c., while carts will be kept underneath. A hydraulic lift, with a lifting capacity of two tons, will raise carts, &c., to the higher level to be painted and mended. At the very back, but communicating with the exit by a wide roadway running under the various blocks, are the stables, in which there are stalls for eighty-eight horses, eight of the loose boxes being arranged for animals that may be diseased, and completely isolated in case of infection. Close by is a veterinary's surgery. Forty-four animals occupy the first floor, reached by an incline.

THE ARCHITECTURAL ASSOCIATION.

SANITATION OF A COUNTRY HOUSE.

By MAX CLARKE, A.R.I.B.A.

A MEETING of the Architectural Association was held on Friday evening last, the chair being taken by Mr. G. B. Carvill, vice-president. After the minutes of the last meeting had been read and confirmed, the following gentlemen were elected members of the Association: E. S. Barr, J. C. Bucknill, F. Bisset, W. J. Deldridge, J. H. Goodchild, C. L. Hampton, G. O. Howship, A. S. Jones, E. J. Kallenborn, E. G. Millar, D. W. Pollock, E. Pitt, H. Sandford, W. J. M. Thomasson, A. H. Whyte and E. H. Walker. Mr. R. H. Weymouth was then nominated for the vacant seat on the Committee created by the retirement of Mr. Arthur T. Bolton to take up his position as headmaster of the Day School. The chairman announced the following donations to the new Premises Fund:—

	£	s.	d.
J. Macvicar Anderson, Esq.	250	0	0
The late Arthur Cates, Esq.	250	0	0
Henry L. Florence, Esq.	250	0	0
Arnold Mitchell, Esq.	200	0	0
Aston Webb, Esq., A.R.A.	200	0	0
E. A. Gruning, Esq.	100	0	0
Alfred Waterhouse, Esq., R.A.	100	0	0
Paul Waterhouse, Esq.			
A. Bramwell Thomas, Esq.	52	10	0
William Emerson, Esq.	50	0	0
T. M. Rickman, Esq.	50	0	0
W. Howard Seth-Smith, Esq.	50	0	0
The late William Young, Esq.	50	0	0
Reginald Blomfield, Esq.	25	0	0
G. H. Fellowes Prynne	25	0	0
A. E. Street, Esq.	21	0	0
Walter Emden, Esq.	5	5	0
W. L. Traut Brown	5	5	0
Total	£1,6 4	0	0

Mr. Max Clarke, A.R.I.B.A., then read a paper on "The Sanitation of a Country House." After referring to the definition of "hygiene" and "sanitation," and citing two specific cases illustrating the responsibilities of architects in regard to sanitation, the lecturer spoke of the sanitary requirements of a house. He said:—

The lie of the ground and the drainage of the subsoil (if such is required) require most careful consideration, always bearing in mind that it is better to lay land drains so that they will convey water away from the house than towards it. Land drains or agricultural pipes are liable to get blocked up at times, and this should be borne in mind when laying them.

The foundations should receive careful consideration even in the country, taking care in a clay district to carry them well down beyond the level which may be affected by droughts. Let me remind you that Portland cement requires more examination and attention than it usually receives from architects. I find it very difficult to get it sufficiently air-slaked—or, in other words, it is as a rule used when it is too fresh; it is more likely to blow or expand when used fresh, accounting for the number of fractured stoneware-pipe collars which are to be met with.

Damp-Courses over Area of Buildings.

Covering the area of buildings with Portland-cement concrete, as required by many authorities, is for the purpose of keeping down ground damp, which, where there is no concrete or other damp-proof course, is liable to be drawn up in the building when the latter is heated, the damp or noxious gas sometimes coming from great distances where the earth is light or porous. In this way sewer gas may be brought into a building from defective sewers existing at a considerable distance. In order to prevent this, care should be taken that the cement is sound and slow-setting, and that the concrete is not porous, the aggregate not being too large, such for instance as brickbats, which one often sees in concrete. The surface should be well beaten down and smoothed over with a shovel so as to form an impervious face, even if the concrete is only to act as a damp-proof course and not as a floor.

Damp-Courses.

Damp courses in walls should receive great attention. The very old-fashioned clause to be found in specifications, "Two courses of stout old slates bedded in cement," should, I suggest, be abolished, as it is most difficult to get stout slates, either old or new. Asphalt often suffers from being laid upon the walls and then used as a gangway by the men on the works, or is otherwise damaged by moving materials upon the walls before the brickwork is continued up over the damp-course. Whatever the material may be, it should be carefully protected until the superincumbent walls are built. In connection with damp-courses and floors, I doubt if sufficient attention is paid to cases where there are wood floors with a space under one side of a wall, and tiles or mosaic with concrete under at the other side. Then some precaution is required to prevent the damp getting from the earth and concrete on one side of the wall to the flooring and timbers on the other side. Numerous methods can be adopted, but they are usually conspicuous by their absence.

Vertical Damp-Courses.

Vertical damp-courses or dry areas are most important to rooms underground. I do not think there can be any doubt that where a wide area cannot be obtained, covering the external face of the walls with a double thickness of asphalt is the very best means of keeping out damp, the asphalt forming a horizontal damp-course at the bottom and extending vertically above the level of the surrounding earth. My experience of hot compositions poured into a cavity in the wall is, that such care is necessary to prevent mortar-droppings getting down, and to ensure the hot material getting down and adhering to that already in, I shall not risk it.

Ventilation under floors should be attended to, sleeper walls being built open to allow of currents of air through the open spaces. One forgets at times that putting in an air-brick to the space under one room, and carrying up the brickwork close under the floor all round without any openings other than the one, is not "ventilation"; it is only leaving a hole. All holes made in walls should have a fall outwards to prevent wet being driven in.

Bedding wall- or pole-plates in main walls at the ground level is a mistake. They should always be carried on corbels, piers or independent walls. In connection with this, I think hoop-iron, well tarred and sanded, is to be preferred to wood wall-plates.

Walls.

With regard to walls, what shall I say? That you should avoid, if possible, using 9in. walls. It is not sanitary work, in my opinion, to build a house costing, say, £2,000, with all the outer walls of 9in. brick; and particularly when the bricks are porous, as so many are nowadays, put together with poor mortar, and not even damped before laying; if the last is not done the dry brick absorbs all the moisture out of the mortar so rapidly that the material is little better than dust or dry mud. Hollow walls require attention to see that the cavity extends below the level of the internal damp-course; also that mortar is not allowed to drop down the cavity and rest on the wall, thus forming a means for the damp to pass from the exterior to the interior lining of the wall. The lead covering of lintels or arches over openings in hollow walls require attention to ensure the ends of the lead being welted and turned so as to direct the moisture to the outer wall.

I have had some experience in building with granite, and I find it is a mistake to allow through or bond stones to extend to the inside face of the wall, as damp patches are usually found where the ends of these stones come. This is, of course, where neither brick lining nor "strapping" (the Scotch term for battening and plaster) are used.

Roofs.

Some points in roofs require attention, one of the most important, to my mind, being in cases where eaves-gutters rest on the tops of walls or on oversailing courses. It is a practical impossibility to make a cast-iron eaves-gutter perfectly watertight; therefore short lengths of lead should be fixed on the top of the walls at each joint in the gutter to take the water which escapes from the joints away beyond the face of the wall, not allowing it to percolate into the brick and stone and so form a very unsanitary spot, as well as an eyesore on the inside. These pieces of lead should be welted at two edges, and of the other two edges the back should be turned up and the front edge turned slightly down where beyond the outer face of the wall.

Down Pipes and Soakers.

Down pipes are as a rule too large and too numerous in most buildings, where gulleys have to be fixed at the bottom of each stack, involving unnecessary drains and extra work clearing out, &c. The pipes should always be fixed so that they are clear of the walls in case of leakage.

I would suggest that "soakers," which are more usual in the North than in the South, are better in every way than either secret gutters or flashing, the cover flashing being less liable to damage than flashing laid on roof slates. Soakers also make a good finish to hips where the taste of the architect does not permit of hip tiles, slate, or lead coverings; the slates can be cut to a close joint down the angle. Slates of a greater width than the ordinary size should be used in these positions, so that no very narrow strips or small angle-pieces are used, as they usually have only one nail or peg and are very liable to get broken and fall off.

I think two courses of slating battens, the lower one vertical and the upper horizontal, is a good method of obtaining an air-space in roof construction, and so rendering the interior less liable to be affected by changes of temperature. Felt should be clearly specified and examined as to quality; the cheapest, which is often seen on work, is not a desirable article.

Silicate cotton or slag wool is a most admirable non-conductor as well as being a sanitary material to be used in almost all cases where hair-felt is so often used, the latter being a happy hunting-ground for all sorts of vermin, whereas the slag wool is to them most objectionable.

I need hardly refer to the fact that the common floor with wood joists, floor boards and ceiling plastered is not a "sanitary" floor, but it will be some time yet before we can get a solid floor of any sort used in country houses even of the better class. With regard to partitions, I think the stud partition, of "quartering" plastered both sides, should be consigned to the past; porous and pumice bricks, breeze-concrete, perforated and solid plaster slabs and solid plaster on expanded metal, are all so much superior that their use should be universal even in country houses. As to the prevention of "dry rot," I would advise you to avoid any heating system which combines heating and a supply of hot water for domestic purposes, unless the former be of the most limited description.

Windows.

High bottom beads or rails to double-hung sashes as a simple inlet for air are not made use of as often as they should; they also form a very excellent stop to prevent wet coming in at these points when heavy gales blow directly on windows. A splayed notch on the outside of the bottom bead is an additional safeguard against water, but do not cut the notch upside down, as illustrated in a well-known work on specifications—evidently a slip, but still liable to be copied by the beginner.

I think we may now turn to the matters which are more usually known as sanitary. Presuming all things are in order, we shall now consider the fittings and drains.

Water-Closets.

Taking water-closets, I should advise in all cases a wash-down or pedestal basin, and in saying this I know I lay myself open to criticism, but I have been through all the points of noise and flush and non-cleaning and comfort and habit, and all the rest of it, and am still of the same opinion. As to the particular type I shall not say much. I think it should not be what is called "large area" water-surface; I do not think the clearing of these is at all satisfactory, even with flushing cisterns of larger capacity than we are allowed to use in London as a rule.

I also think the basin you select should have the most simple joint to the soil-pipe that can be obtained, consistent with perfect water-seal or air-tightness, depending upon the position of the joint. The back, of course, should be straight, and the flushing rim, if it is of that variety, should allow a good body of water to fall all round. Seats should always be of hardwood in two thicknesses, preventing warping and cracking

The water-closet should be fixed so that the flushing cistern can be placed immediately over the inlet arm; the old-fashioned position back to a window is the worst for a water-closet worked with a W.W.P. or flushing cistern. The seat should either have rubber bosses fixed on the underside or iron bearers projecting from the wall, leaving the floor clear for sweeping; the hinges should be brass pivots and plates fixed to the edges of the seats at the side—not butt hinges, which are very usual. Every water-closet basin should be white; printed basins hide dirt.

One point in connection with the W.W.P. which does not receive the attention it deserves is the rate at which it fills. I put in specifications that it is to fill in a minute and a half, which means that with a low head of water a ¾in. ball valve must be used; and as this costs a little more than a ⅜in. ball valve, it is not always used when it should be.

As far as my experience goes a perfect flushing cistern has yet to be invented, so I shall not offer you any advice upon the sort to use, except that the fewer the working parts the better. The shell if of cast-iron should always be galvanised; wood shells lined with lead are best in some situations, both on account of quality in the water and because they are not so liable to damage from freezing. I think a chain, or for the better qualities a brass rod, *not* in a slide, the best form of pull. A stop-cock on the water-supply to each flushing cistern is an advantage when repairs are needed. The position of the arm for connecting the anti-syphon pipe is of some importance, and the method of connecting the pipe to the arm when the latter is of any stoneware type is a difficulty sometimes not satisfactorily dealt with; therefore, as the best way out of the difficulty, I am inclined towards a lead trap to which the anti-syphon pipe can be wiped.

If a valve closet must be fixed, use a good one. A lead tray should always be fixed under cheap valve closets in case of leakage, with a weeping-pipe to the outer air having a copper flap at the end to prevent wind blowing up the pipe; and the same applies to the overflows from all cisterns and flushing-tanks. Care should be taken to make the wood fittings in connection with these water-closets easily movable and clear of plaster-work, &c.

Baths.

As to baths, whether porcelain, cast-iron or copper be used must always be a matter of individual taste; the first-named is always difficult to heat if a hot bath is required. Copper is the best in this respect, but a good one is always expensive, and requires stout cradling to prevent it being put out of shape.

The bath fittings should, in my opinion, be of ample size, so that the bath can be filled rapidly, and I favour valves or taps which are quite distinct, the hot supply from the cold, and the nose projecting well over the edge of the bath if not actually inside (which is a modern improvement), very useful in case the valve leaks at the stuffing box or union. Lead safes are useful where the baths are enclosed, but the best type of baths do not require enclosures, and with these lead safes are unsightly. A tile or mosaic floor is preferable, or perhaps a sunk marble slab if funds will permit.

The waste-pipe should, in my opinion, discharge into an open head outside, so that the traps may not be syphoned out. I think this a better method than having long continuous wastes fitted with anti-syphon pipes.

Lavatories and Sinks.

The number of lavatories and sinks from which we can select is so large that all tastes are catered for. Those having complicated fittings should always have lead safes under, in case of leakage. Enclosures are to be avoided, as they become receptacles for dirt and objectionable things in general. Every fitting of this nature should have a proper overflow. I have had considerable trouble with sinks for hot-water washing-up in cases where glazed ware was unsuitable, and have tried wood lined with lead, zinc and tinned copper, but they all proved practically useless in a very short time in cases where there was much washing-up to be done with hot water, 2in. teak put together with red lead, galvanised bolts and brass screws being the only form of sink suitable for this class of work; in this case I have had the waste plugs made hollow and of sufficient height to form an overflow. Care should be taken to have a proper grating in the waste washer, which can be removed but not *too* easily taken out, otherwise it is never in its place and pipes get blocked up. Except in large houses I consider that a water-closet should be used for emptying the slop-pails into, but when a slop-sink is required it should resemble a water-closet, not have a grating or anything of that nature to the outlet; the latter are only suitable for fixing under hot or cold draw-off taps, which should be provided in the housemaid's closet. If a real slop-sink is provided it must be fitted with a ventilated soil-pipe and anti-syphon pipe, exactly as a water-closet would. All sinks should have high backs or some other means of preventing the wall or enclosure from getting wet.

Traps,

usually of drawn lead, should be fixed under all fittings, with brass cleaning screw, the latter having a square or oblong projection for unscrewing—not a couple of small holes, or an indentation requiring a special tool to unscrew it. Connections between fittings and lead-pipes should always be made with "unions and fly-nuts." I shall only direct your attention to one other point in connection with fittings—the word "self-cleansing," now in such common use. It would be well if all architects, and, indeed, their clients also, would understand that this term does not mean that the particular fitting will keep itself clean, but that there are no corners or angles or the like where dirt can accumulate.

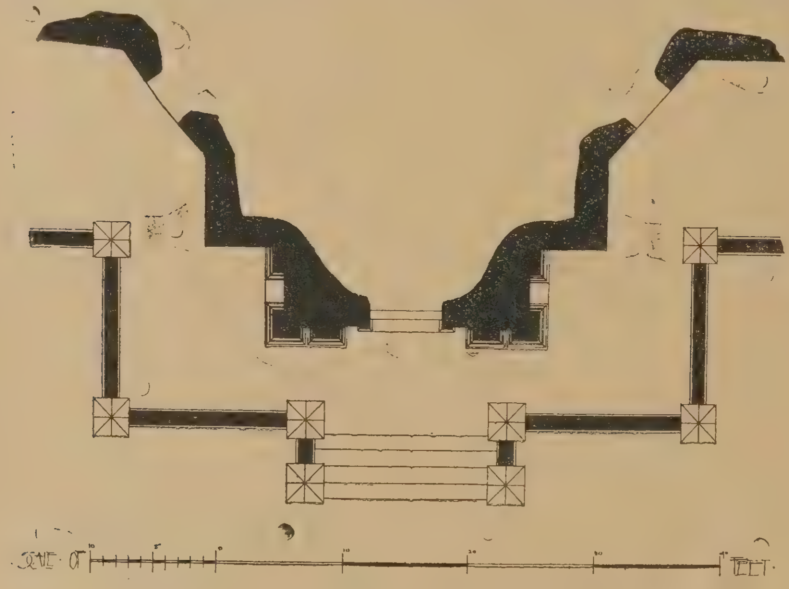
Water-Pipes.

Pipes for water service should be considered with regard to the nature of the water, particularly in some localities where both the water and the earth may cause deterioration of lead. I show you a piece of lead-pipe taken from a house near Bedford some time ago, the exterior eaten away by some action of the earth in which it was laid; some hundreds of yards had to be renewed in this case. I laid some lead-pipes in the neighbourhood in trenches which were filled with sand and gravel, with which the pipes were surrounded to prevent damage from the above cause. Lead lined with tin, or iron lined with glass, are very good, but are expensive, and the former require special joints.

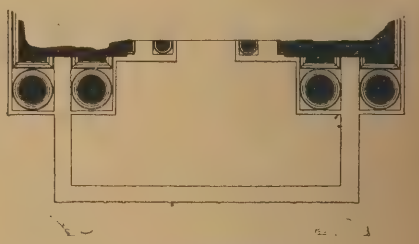
Cisterns.

The storage of water is, of course, a debated point. Personally I am for storage, as I consider it can be carried out with very little fear of contamination. In a country house a supply of water for drinking and cooking purposes can be stored in a glazed stoneware tank (if a slate or galvanised iron one is not considered good enough). The general supply can be stored in a galvanised wrought-iron cistern, or cast-iron, or steel plate. If the size is large the wrought-iron should never be less than ⅛in. thick; many are so thin as to be useless in a very short time. I have found it an advantage when a galvanised cistern is used to have it thoroughly cleaned out when all the connections are made, and then to paint the insides twice with Portland cement mixed with water to about the consistency of paint; this preserves the galvanising and covers many of the little projections left in the process.

I need hardly remind you that close-fitting covers to the cisterns are essential; that the cisterns should if possible not be placed where the water is liable to freeze in cold weather. Near a chimney is a good position, other matters being equal. Safes under are always advisable in case of accidental overflow.



PLAN OF ENTRANCE.



PLAN OF BALCONY.

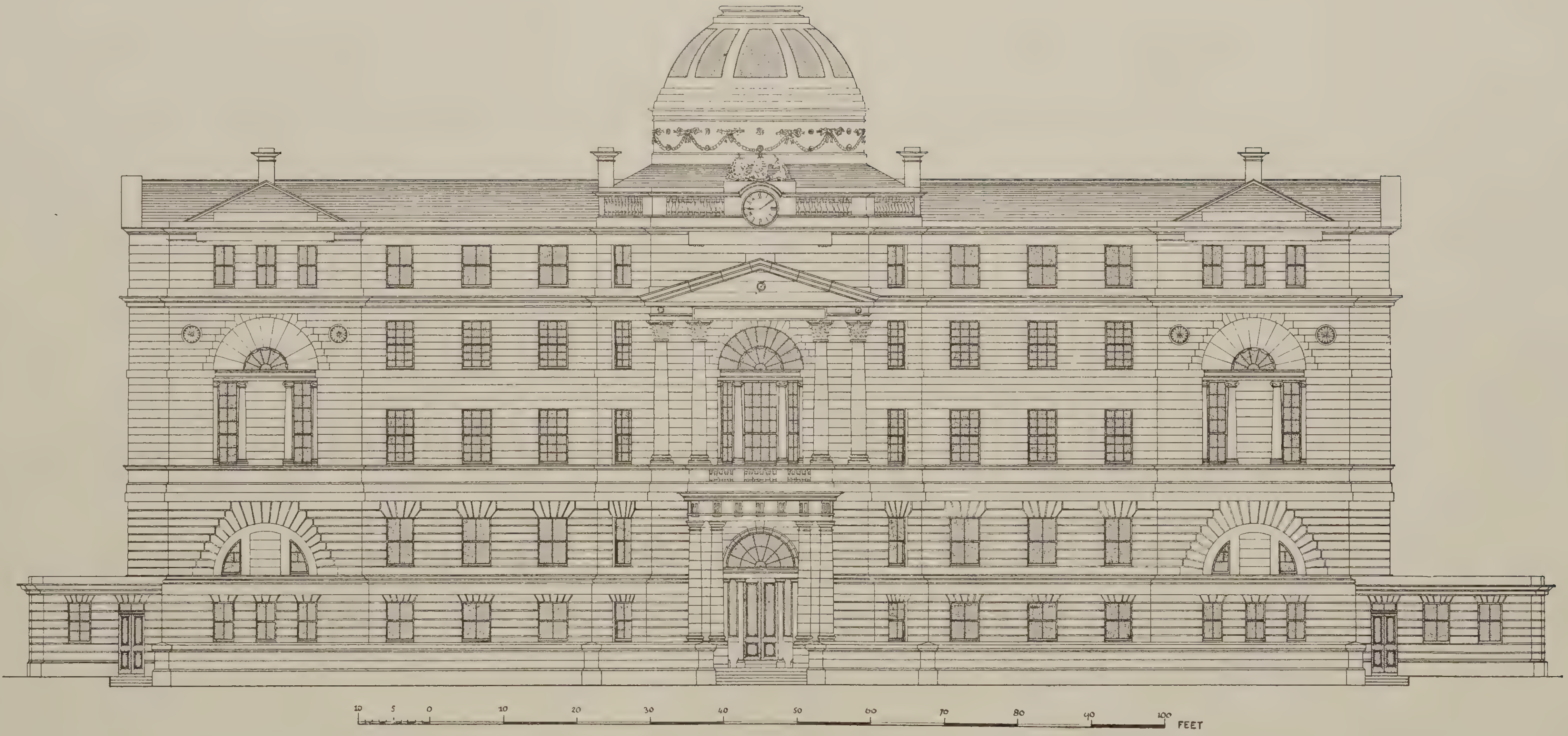
THE ROYAL INFIRMARY, GLASGOW. MEASURED AND DRAWN BY DAVID B. HUTTON.

The position of outlets deserves attention. They should always be in the side of the cisterns, so that dirt cannot get down the pipes; and if a supply is taken off for hot water it should always be taken out of the cistern below the general cold-water supply, otherwise in times of scarcity there is danger of leaving the hot-water system without water. One further point with regard to cisterns. There are some on the market which are intended for use as a reserve only, the supply under ordinary circumstances coming direct from the service-pipe and not passing through the cistern. I am not in favour of this arrangement, as the water might be in the reserve for so long a period that its use might be undesirable.

Soil-Pipes.

I think we may turn to the soil-pipes and drains, dealing with the former first. Naturally lead is the most suitable material, except in cases where large quantities of hot water alternating with cold have to be dealt with; under these circumstances cast-iron is more desirable, as the lead is buckled and at times cracked by the alternate heating and cooling. The connection of the foot of the soil-pipe to the drain is often not carried out as it should be; if the soil-pipe be of 3½in. diameter (and there is no necessity for it to be larger) the brass tail-pieces usually sold have such a narrow

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, November 20th, 1901.



THE ROYAL INFIRMARY, GLASGOW (ROBERT ADAM, Architect). Measured and Drawn by DAVID B. HUTTON.

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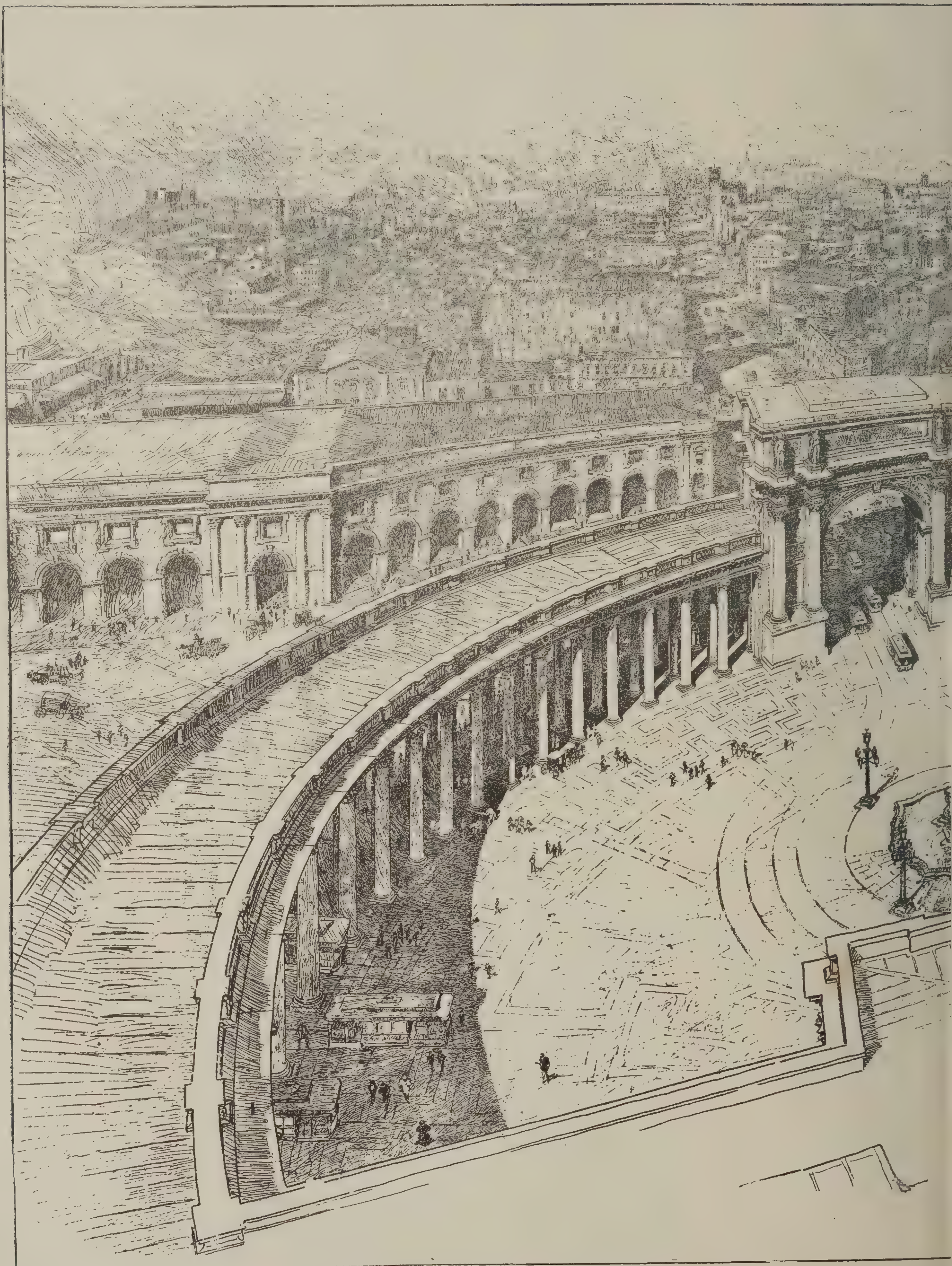
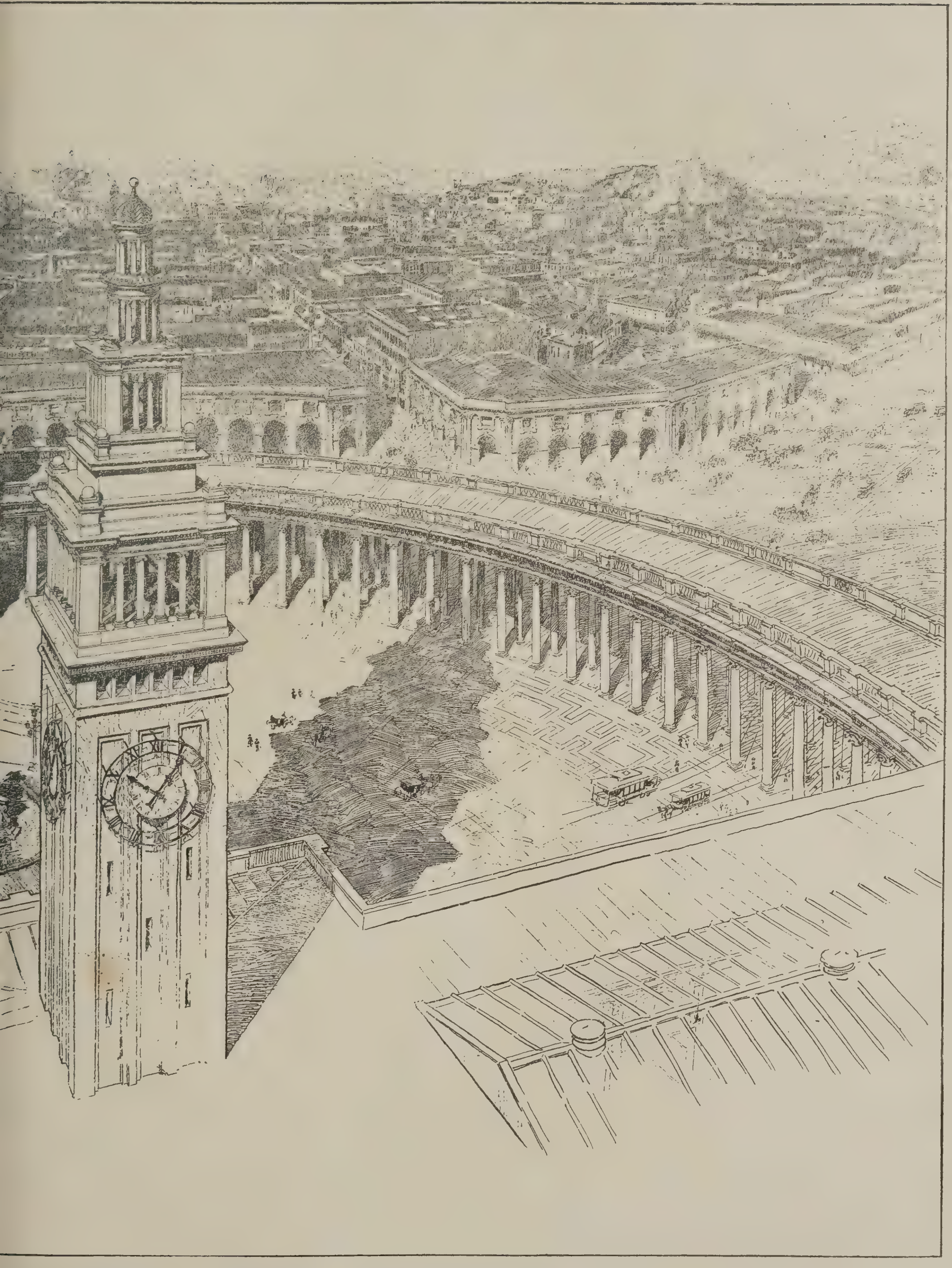


SUGGESTED PERISTYLE AND ARCH FOR THE FOOT O



ARKET STREET, SAN FRANCISCO. Willis Polk, Architect.

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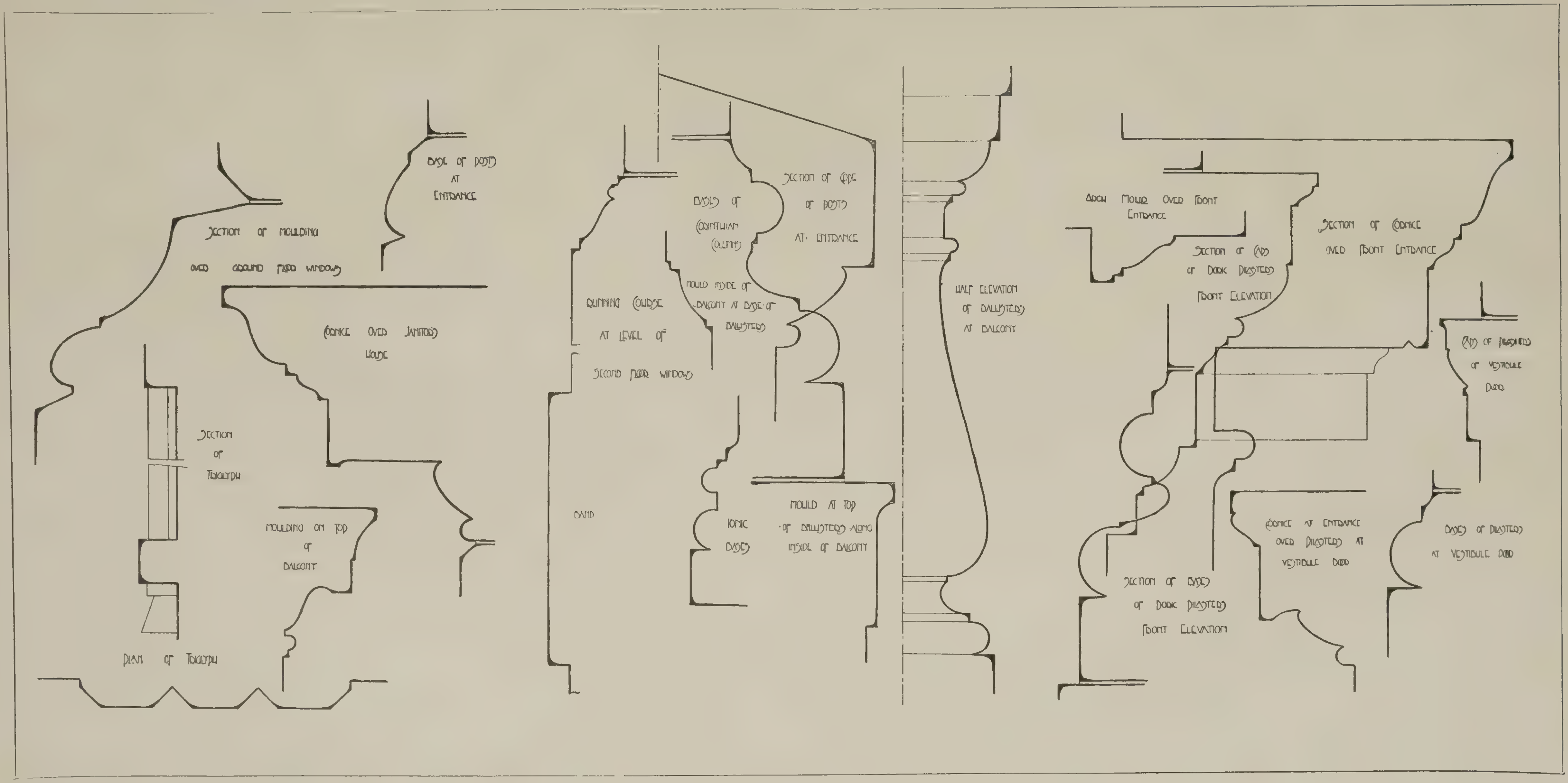
Section of Moulding over Ground Floor Windows
Base of Posts at Entrance
Cornice over Janitor's Lodge
Section of Triglyph
Moulding on Top of Balcony
Plan of Triglyph
Running Course at Level of Second Floor Windows
Band
Bases of Corinthian Columns
Section of Cope of Posts at Entrance
Mould inside of Balcony at Base of Balusters
Ionic Bases
Mould at Top of Balusters along Inside of Balcony
Half Elevation of Balusters at Balcony
Arch Mould over Front Entrance
Section of Cap of Door Pilasters Front Elevation
Section of Cornice over Front Entrance
Cap of Pilasters of Vestibule Door
Cornice at Entrance over Pilasters at Vestibule Door
Bases of Pilasters at Vestibule Door
Section of Bases of Door Pilasters Front Elevation

DETAILS, ROYAL INFIRMARY, GLASGOW.

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flange that it will not bear on the collar of the pipe, but slips right down; a wide flange bearing all round on the stonework socket should be specified and insisted upon; the tail-piece should be lined with the lead-pipe the whole length, the latter dressed over the flange all round and the joint wiped round the top edge; the whole length of the tail-piece should show above the ground level, and the joint to the drain be made with cement well flaunched and trowelled hard. A sufficient number of tacks should be put to lead soil-pipes, not less than every 5ft., in pairs on both sides. Bends should of course be avoided where possible. The soil-pipes should be carried up to a sufficient height to ensure the gases coming from them being taken away clear of windows and ventilators, but not up the side of chimneys finishing close to the chimney-pots, in which case there is a great probability that as the air from the drain comes up the ventilating-pipe it will go down the smoke-flue.

Branches into soil-pipes should he arranged so as to avoid joints being in the thickness of walls, and the connections of water-closets to the branch pieces should be carefully attended to.

Drains.

Certain points about drains should always have careful attention; for instance, where there are separate soil and rainwater drains the former should always be laid below the latter. If the rainwater be stored for use, the joints of the pipes conveying it should be most carefully made, as it is possible for water to get *into* the pipes from the surrounding earth as well as to get out, and the quality of that getting in may be very objectionable. One of the chief difficulties in laying drain-pipes is to get a true alignment at the joints. The cement exuding when the pipes are pushed up together is another difficulty, careful wiping out of the pipes at each joint being the only remedy for this most frequent defect. To obviate these difficulties some use gasket or hemp bound round the end of the spigot, to make the end of the pipe fit close and concentric; but I think the placing of a ring of composition on the spigots and sockets and a cement joint outside is the best method of avoiding difficulties of this nature and of taking a great responsibility off the man who actually lays the pipes.

The concrete on which the drains are laid is a matter on which much difference of opinion exists. I suggest that a bed 6in. or 8in. thick be laid with indentations at regular intervals for the collars of the pipes, allowing room enough to make the joint. The whole length of the pipe bearing on the concrete renders the lengths much less easily knocked out of position by accident. When each length is completed a benching at the side up to about the middle of the pipe is sufficient. Except to resist external damage, there is no object to be gained in surrounding pipes entirely with the ordinary concrete, which is of too porous a nature to keep in any sewer gas or air which may escape from defective pipes or joints. Of course if a pipe surrounded with concrete, say 18in. or 20in. square, is to be looked upon as a beam, then it is superior to a pipe with benching up to its middle only; but I think we should always try and get a sufficiently good foundation for our drains to enable us to abandon the beam theory.

Manholes.

If we turn to the construction of manholes of inspection chambers, a few remarks are necessary. If built of bricks, I do not consider footings necessary to the walls; in ordinary earth a slab of concrete extending to the external face of the wall is sufficient. I prefer rendering the interior with Portland cement to the white-glazed brick; the joints in the latter take away any benefit gained by the glazed surface of the brick. Some say that hot water damages the rendering, but as hot water does not often rise above the benching I have not found the damage to occur; the benching should be steeper than is usual, and of a convex section, so that the solids washed upon the inclined surface may slide into the central channel.

Manhole covers should always be galvanized; it is quite worth the extra cost. Turning to what is usually called the "air inlet," I think that unless it can be placed in an unfrequented position it should always carried at least 8ft. high, without any mica flap or valve of any sort—these are a delusion: they get out of order so easily, and their use as at present in towns will not continue very long.

It is an accepted fact that there is an up-current in most ventilated soil-pipes under ordinary circumstances, but where a water-closet on the soil-pipe is used it reverses the current for the time and drives the air out at the first available outlet, which is usually the so-called "inlet." For this reason, particularly in towns, the inlet should be carried up above all windows and the like, but in the country a pipe of the same diameter as the drain, taken up say 8ft., with a bend and wire-guard at the top to prevent leaves and so on getting in, is quite sufficient—perhaps more than sufficient some will say, and advocate a grating, say 18in. sq., close to the ground level.

I need hardly remind you that overflows from rainwater tanks should not, under any circumstances, be connected to soil drains, nor do I think surface-water drains should, even with traps fixed on the outlet, unless some lengths of open channel intervenes between the trap on the surface-water drain and the connection to the soil drain.

Sewage-Disposal.

In many districts the disposal of the sewage of a country house is a great difficulty where there are no sewers in the neighbourhood and the pollution of streams is very properly objected to. In such cases it is perhaps desirable to consider the advisability of having a separate system of drains to take the waste from baths, lavatories and fittings which do not take solid filth with a tank. The sewage, or excremental filth portion, can be dealt with by some of the forms of bacterial treatment known by the various names of bacterial filters, septic tanks, &c. From what I have read on the subject, it seems to me that the treatment should be a form in which the sewage is passed first through a closed tank, and then through filters exposed to the light. I would remark that I heard of the arrangement now known as the bacterial tank from a member of the Architectural Association a good many years ago, as Moura's automatic scavenger, a description of which can be seen in the Proceedings of the Institute of Civil Engineers, vol. 68, p. 350, 1881-2; vol. 72, p. 359, 1882-3; vol. 78, p. 502, 1884. From these notes I had a scavenger constructed in the latter part of 1893 at a private house I was then building, in the hope that it would render the sewage less offensive. This it has done most effectually; and although I cannot claim for it that the effluent is by any means clear, it is not offensive.

Earth-Closets.

I do not suppose any paper on the sanitation of a country house would be complete without some remarks on the dry system. A properly situated and arranged earth-closet is a most sanitary adjunct to a country house, no matter what class it may be intended for. Everything good in this world requires attention, and because the earth-closet requires perhaps a little more attention than people care to bestow upon it, it has got into bad repute. I speak now of outdoor—and shall we say isolated—earth-closets. If each country house were provided with an earth-closet constructed on the lines advocated by Dr. Poore in his books "Rural Hygiene" and "The Dwelling-House," I imagine some of the difficulties of sanitation would be got over, and some of the danger from the want of it would never arise. I refer, of course, to the "dry catch" system, the principle of which is that the floor on which the excreta falls slopes towards the outside, allowing the urine to run into a receptacle filled with mould, and so the excreta is left dry, in which state objectionable gases are not generated.

I have tried to bring before you some points which are usually admitted as essential to the sanitation of a country, or indeed, any house, but which I find require a great amount of supervision to ensure their being done properly; and as the very essence of sanitation is thoroughness in every small detail I commend the paper to your most careful consideration with the final remark that one of our objects should be to try and obtain "the most perfect action of body and mind during as long a period as is consistent with the laws of life; in other words, to render growth more perfect, decay less rapid, life more vigorous, death more remote."

The Discussion.

Mr. Thomas Blashill said he had listened to Mr. Clarke's paper with much interest. With regard to putting in drains, he thought that workmen were getting better, this being due to the fact that architects and builders knew more definitely what they wanted. As to floors, coke-breeze concrete should be put down and the boards nailed directly on to it. There would then be no risk of "dry-rot" or of ground air finding its way above; but the boards should be treated with some preservative solution, and, moreover, it should be noted that thin boards were less likely to be affected than thick ones. He had seen dry-rot in upper floors which had been pugged and the boards laid too soon. If the evil were discovered in time the fungus growth could be scraped off and the work given a good thick coat of the preservative solution mixed with whitewash. That would prove a cure. The usual defect in cast-iron closet ventilating-pipes was the formation of rust, which fell to the bottom and caused a stoppage. He expressed himself very strongly in favour of overhanging eaves, which prevented wet getting into the walls. With regard to sewage-disposal in country districts, he pointed out that the local authority would not allow it to be discharged into the ditches, while if it were put over grazing land which was not perfectly porous the result was most disastrous to cows. There was only one method of satisfactorily disposing of cottage sewage—the old-fashioned method of putting it on the garden; but he pointed out that the excreta should never be buried; it should just be covered with earth so that the bacteria could resolve it. Earth-closets were admirable, but ordinary earth – not "dry" earth or ashes – should be used.

Mr. P. Gordon Smith said he had come to the conclusion that stoneware drains were not to be relied upon because the Portland cement so often split the joints. He intended to use heavy cast-iron pipes treated with Dr. Angus Smith's solution; these he considered would be the drains of the future for all purposes. He thought a great deal more rainwater might be caught; but if this was not done properly it would be prejudicial to health. Gulleys were placed under rainwater pipes whether they were wanted or not, and were often improperly used. Copper baths were excellent in their way, but involved an enormous amount of labour in keeping them clean, so that their use was almost prohibited. Spray baths were to be recommended on account of the comparatively little water they used. With regard to cisterns, these were made more useful when in duplicate, so that if repairs were necessary the water needed to be shut off one only, thus avoiding inconvenience. Nothing had been said about cesspools. In his opinion they should never be allowed anywhere.

Mr. Edwin O. Sachs, Mr. W. E. Hewitt, Mr. Francis Hooper, Mr. E. Greenop, and the chairman also took part in the discussion. Mr. Sachs spoke of the dilatoriness of country builders, and expressed the wish that it were possible to inflict punishment for scamped work. Mr. Hooper drew attention to the necessity, in laying drains, to see that these did not fail just at the footings of the walls because the space excavated had not been concreted. Mr. Greenop referred to the fact that long lead waste-pipes on houses tended to twist under the sun's rays, and should therefore be replaced by galvanized iron pipes. He mentioned a curious instance in which £40 had been charged by the water company for extra water which they computed had been used by a consumer's flushing tank.

Mr. Max Clarke, replying to various questions, stated that it was perfectly useless to bury excreta 3ft. deep in the earth; it should be as near the surface as possible, because the bacteria required air. As to the tightness of drains, this could be done just as effectively as with hydraulic mains having a pressure of 400lbs. or 500lbs. to the sq. in.; pipes with flanged joints and asbestos packings were all that was needed. In reply to Mr. Hewitt's question as to whether he had seen tanks made by digging a hole and rendering the earth itself with concrete as described on p. 229 of last week's issue of the Builders' Journal, Mr. Clarke said this could be satisfactorily done if the gravel would stand up In conclusion, he drew attention to some New York drainage plans exhibited in the room showing every pipe and trap, as these were the kind which would be used in this country in the future.

The chairman announced that owing to ill-health Mr. Francis Bond would be unable to read his paper on "Capitals" on November 29th. Mr. Arnold Mitchell would therefore read it for him. The meeting then terminated.

ORGAN CHAMBERS AND CASES.

At a meeting of the Sheffield Society of Architects and Surveyors held on Thursday last, in the Society's new rooms in Leopold Street, Mr. Charles F. Brindley (of the firm of Brindley & Foster) gave a lecture on "Organ Chambers and Organ Cases."

He said the placing of an organ in either a concert room, place of worship, or a private house, so as to combine to the fullest possible extent musical, artistic and utilitarian principles, presents many difficulties. The organ might well be described as the most complex of complicated machines, the building of it necessitating an intimate knowledge of mechanics and science, while musical taste and culture must be present in a marked degree. He intended, however, to deal only with placing and encasing instruments, which vitally concerned the work of architects.

Dealing first with the placing of organs in concert halls, the best position for the organ was at the far end of the orchestra, and as an instance of good arrangement Mr. Brindley gave the case of the instrument built by his firm in the Town Hall at Pietermaritzburg, South Africa. Special attention should be given to allowing ample space, so that the organ may be built on one level, in order that it may not be affected by changes of temperature and so thrown out of tune by the consequent expanding of metal pipes, which occurs when instruments are constructed at different heights. In providing for machinery for blowing, care must be taken that (a) the room be dry; (b) within reasonable distance of the organ proper; (c) the temperature be the same as that of the hall.

Dealing next with the placing of organs in places of worship, the lecturer stated that lack of space allowed and disregard to all proportion were the greatest evils. Mr. Brindley then gave the opinions of experts with regard to position. The placing of the organ on a screen dividing the nave from the choir is undoubtedly the best, but is unfortunately seldom adopted and favoured by modern architects. Putting an organ in the west gallery is highly recommended by many experts. An organ chamber is not a good place for an organ. If this latter method be a necessity, the lecturer pointed out that it devolved upon the architect to design such chamber so as to mitigate the evil as much as possible by providing plenty of space, making it of sufficient height, and having ample opening into the church for the ingress of sound.

With regard to decoration, Mr. Brindley stated that the silvering adopted by his firm was well received by architects. The great thing was not to decorate pipes so as to spoil their appearance as metal pipes. The lecturer considered that inasmuch as front pipes were never made of gold, gilding might be considered somewhat out of place. Spotted metal was subject to rapid tarnishing.

A first-class built organ had pipes of full size; each pipe had ample speaking room and was of good calibre. In short, a properly-built organ may be from fifty to sixty per cent. heavier in weight than that of an organ of the cheap class. Consequently, a first-class builder required more room for a given specification than the inferior builder would know what to do with.

A Memorial Tablet at Rochester Cathedral has been unveiled to the late Mr. John Hopkins, the late organist and choir-master. It is of alabaster marble, with a centre of black marble and is the work of Mr. James E. Smith, of York Street, Westminster, carried out under the direction of Mr. S. T. Aveling, of Rochester.

Masters and Men.

The Unemployed in Berlin are now stated to number 50,000.

The Strike of Slaters at Hull and Bridlington has come to an end, in the twelfth week of the struggle. In February last the operative slaters and tilers of Yorkshire approached their employers and submitted a code of working rules for the county. Subsequently, joint conferences were held, and in July last an agreement was arrived at, and a new code of rules established and signed by the representatives of both parties. These rules came into force on August 1st, and on August 17th the Hull men took exception to them and came out on strike. The operatives' amalgamation, true to their agreement with the employers, declined to support their Hull members and refused them strike pay or travelling money. They also advertised for and drafted unionist workmen into the city to fill the places of the strikers. The Hull men failed to recognise the importance of this step or the power of their amalgamation, and they allowed themselves to be influenced into a false position by a local federation of operatives, numbering in the aggregate about 3,000 trades unionists. This federation did its utmost to support the Hull slaters and tilers both by "moral and financial aid." In consequence of a public manifesto issued by this local federation, the Yorkshire master-slaters at once entered into active co-operation with the Operative Slaters' Amalgamation, with a view to gaining the mastery of the unwarranted position taken up by the Hull men and their local federation. The Yorkshire employers drafted their senior apprentices into Hull, as also did other members of the National Association of Slate Merchants and Slaters, until a superabundance of labour obtained. At the height of the struggle four Leeds masters journeyed to Hull and slated a large building. Finding themselves beaten, the men made many overtures for a "conditional" surrender. They eventually attended before their district executive council, signed the rules, apologised for their conduct prior to and during the dispute, agreed terms for repayment of the outpocket expenses occasioned by the dispute, and gave an undertaking to abide by the ruling of the district committee in the future. Consequently the Hull employers have opened their yards and taken on such of the men as they had vacancies for.

The Birmingham Master-Builders' Association held its annual meeting last week, Councillor F. G. Whittall presiding. In the report for the year the Committee regretted that the falling off of trade, referred to twelve months ago, had become more marked, and much work that would probably not now be executed had been held back owing to the high prices of material and labour. The Committee felt strongly that the present high rate of wages was no longer justified by the state of trade, and they had received from individual members many complaints as to the great inconvenience resulting from the present arrangement of several trades commencing and leaving off work at different hours. Consequently, they had served notices on all trades for a general reduction of wages and for uniform hours of work. The Committee felt they would be voicing the opinion of every member of the Association by expressing to the Chancellor of the Birmingham University their regret that Birmingham architects had been excluded from a competition for the University buildings. The balance-sheet showed that the receipts for the year were £181, which with the balance from last year made a total of £368. The various disbursements amounted to £154, leaving a sum of £214 to the credit of the Association. Mr. Albert S. Smith was elected president for the ensuing year and Mr. John Barnsley vice-president. Mr. G. Twigg was reappointed treasurer, Mr. E. J. Bigwood secretary, and Messrs. T. Johnson and J. S. Surman auditors. The committee were also elected. In order to financially strengthen the position of the Association, it was decided that from the commencement of next year the annual subscription should be 1s. for each £100 of wages paid during the previous year. In the evening the annual dinner was held at the Grand Hotel. The Lord Mayor (Alderman J. H. Lloyd) presided, and among those present were Mr. Albert S. Smith (president of the Association), Major J. Barnsley (vice-president), Councillor F. G. Whittall, Messrs. A. Chambers (Leicester, president of the Midland Federation), W. H. Bidlake (president of the Architectural Association), A. Rowse, Ewen Harper, C. E. Bateman, Alfred Harper and Arnold Harris. Mr. C. E. Bateman, in proposing "Success to the Birmingham Master-Builders' Association," expressed the hope that some member of the Association would secure the contract for the new University buildings. The president replied, and referred to the proposal to reduce the operatives' wages. The Association, he said, was not formed for the purpose of cutting down the men's wages, and they regretted that it was necessary to interfere with them. No one grudged the operative a good wage, but what they did resent very much was that restriction of output, that constant lessening of the amount of work which the unions encouraged. Other notices had been served upon the operatives having reference to certain unreasonable restrictions in trade rules, which they were glad to have an opportunity of discussing, and they sincerely hoped all the matters would be amicably settled.

New Patents.

These patents are open to opposition until December 23rd.

1900.—**Fanlight Openers.**—19,097. E. Wait, 23, Plewlands Terrace, Morningside, Edinburgh. The fanlight is connected with a horizontal bar by knuckle-jointed arms. At one end of the bar is a pinion operated by a rack, which rack is revolved by a cord wheel fixed at the bottom of it, so that the fanlight opens or closes according to which way the cord is pulled.

Door Closers.—20,385. H. J. Huggins, 51, Coldharbour Lane, Brixton, S.W. A cylinder and spiral spring are combined with a hollow piston-rod provided at its outer end with a controlled air-exhaust. The closing action can thus be regulated to a nicety—so preventing slamming.

Jointing Lead Pipes.—21,139. R. A. Lowe, Lower Camden, and H. Line, both of Chislehurst, Kent. The end of each pipe is passed through a ferrule and bent over so as to form a flange. The pipes are then drawn together by a screw-nut, with or without packing. The object is to avoid soldering.

T-Squares.—23,179. A. Pattison, Friars Wood, Newcastle-under-Lyme, Staffs. Small milled rollers are mounted in or on the head of the T-square, to facilitate its use on the board.

The following specifications were published on Saturday last, and are open to opposition until December 30th. The name in italics is that of the communicator of the invention. A summary of the more important of them will be given next week.

1900.—19,280, Jandus Arc Lamp & Electric Co., Ltd., Gorham & Jones, electric arc lamps. 19,318, Godfray, distributing steam and water for heating and other purposes. 19,575, Childs, cradles and platforms of endless chain or rope hoists. 20,323, Nuttall & Wilson, baths. 20,459, Howson, waste-valves. 20,588, Coe, incandescent gas lighting. 21,219, Stevens, vices. 21,226, Brown, drying bricks, tiles, &c. 21,879, Digby, lamps for theatre stages. 22,067, Willshear, refuse-destroyers. 22,579, Schroeter, high-pressure steam-heating pipes. 22,891, Buchberger, apparatus for drawing in perspective from geometrical and other sketches. 22,921, Illidge, casement stays. 23,004, Smith & Walker, rainwater pipe wall-socket. 23,305, Keddell, domestic firegrates. 23,605, Portable Gas Fountain Syndicate, Ltd. (*Thorert*), incandescent gas burners. 23,701, Rosenberg, self-igniting incandescent gas-lights.

1901.—12,069, Lassam, glazing bar for skylights. 13,373, Murray, float valves. 16,588, Herdman, non-conducting coverings for steam pipes and other surfaces, packings for walls, &c. 16,695, Holmes, chains. 17,479, Vollert, detachable ornamental head for nails and screws. 17,995, Hunt, conveyors. 18,809, Mitchell, appliance for illustrating by sectional views the construction of pieces of mechanism.

BUILDING CONSTRUCTION.

(*Continued from p. 237, No. 353.*)

Beams (*continued*).

37. I HAVE assumed that there is a neutral line, and that it bisects the cross-section horizontally. The material being assumed to be homogeneous and the loading and reactions of supports being taken to be forces at right angles to the centre line of the beam symmetrically applied (so that they do not produce any torque or twist to the beam), there is no difficulty in agreeing to this assumption. Where the cross-section is not a rectangle placed with two sides horizontal, the position of the neutral line is not so obvious. The neutral line, in all cases where the forces applied to a horizontal beam are vertical, passes through the centre of gravity of a cross-section. The condition that a line passes through the centre of gravity of a plane figure is that a thin stiff plate cut to the figure, when placed so that this line lies along a fine knife-edge, will balance. This means that if the area on each side of the line is divided into very small equal parts, and if each small part is considered as a weight or force, and its amount is multiplied by its distance from the line, the sum of the products on one side of the line shall be equal to the sum of the products on the other side of the line. (The student should remember that a line through the centre of gravity of a plane figure does not necessarily divide it into two equal areas. For example, take an isosceles triangle having its base 3in. and its height 3in. Its centre of gravity is at O (Fig. 43), 1in. from the base, and a horizontal line through O divides the figure so that there is a triangle above and a trapezium below. The area of the triangle is $\frac{2 \times 2}{2} = 2$; the area of the trapezium is $\frac{2+3}{2} = \frac{5}{2}$.)

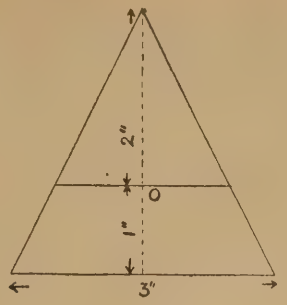


FIG. 43

The centre of gravity of a plane figure may be found experimentally by cutting the shape in zinc, making this fairly flat and then balancing it on a knife-edge: the line along which it balances passes through the centre of gravity; find a second line in the same way; the intersection of these lines is the centre of gravity of the figure. It follows from Hooke's law that the force of the stress per unit of area is proportional to the distance of the element from the neutral line. Suppose the stress per unit of area at unit distance is k, then at any distance y the stress per unit area is ky; if Δ be the area of each element, the stress on each element is $k\Delta y$, where $k\Delta$ is a constant. If the quantities $k\Delta y$ are positive in sign above the neutral line, they are negative below the neutral line; the condition that the neutral line passes through the centre of gravity is that $\Sigma\Delta y = 0$; but the pulling stresses are on one side of the line and the pushing stresses on the other side, and these two sets of stresses are equal. $\therefore \Sigma . k\Delta y = 0$, and this condition is fulfilled if $\Sigma . \Delta y = 0$. (Σ is the symbol for the "sum of"; and $\Sigma\Delta y$ means the sum of all the quantities found by multiplying each little area Δ by y, its distance from the neutral line or axis.) The forces applied to the beam have no resolved part at right angles to their line of action.

38. It is otherwise, however, if the external applied forces are not at right angles to the centre line of the beam; such forces give a pull or thrust endwise to the beam. If p is the stress per unit of area at the outside fibres at the top of the beam shown at Fig. 44, a direct end thrust of Ap, where A is the area of the cross-section, will bring the neutral line down to D, as shown, and there is now no stress in the bottom fibres. On the other hand, a pull of Ap would double the stress on the bottom fibres, and relieve the top fibres from all stress. Greater and less thrusts and pulls will move the neutral axis outside the limits of the cross-section on to some intermediate positions which are not central.

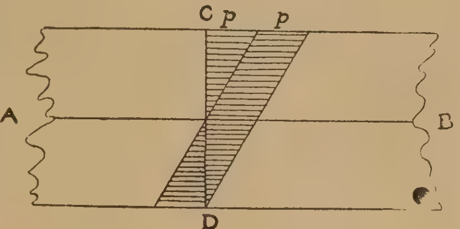


FIG. 44

If p is the stress per unit of area at which the material will yield, the beam will break, because, though only the outer fibres are stressed to this amount if they yield a greater stress comes upon the next layer, and so on in succession: the beam breaks down instantaneously.

39. With most materials their power to resist crushing is not the same as their power to resist tearing. We have seen above that the neutral axis of a cross-section in a horizontal beam subjected to vertical forces passes through the *centre of gravity* of the cross section. These conditions were taken account of in designing cast-iron beams forty to fifty years ago, and they are still of importance in construction. Fig. 45 represents a cross-section of a cast-iron beam: the area above A B, being in compression, is smaller than the area below A B, because the material will bear a much greater stress per sq. in. in compression than in tension. If p is the stress per sq. in. at which the material will crush, and p' that at which it will tear, it may be decided that the design will not allow greater stresses than $\frac{p}{5}$ and $\frac{p'}{5}$; then $\frac{a}{5} p' = \frac{b}{5} p$. The *factor of safety* is said to be 5, because the beam might carry five times the working load and just be on the point of breaking.

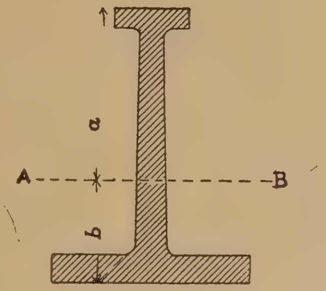


FIG 45

40. Take a light piece of wood of uniform rectangular cross-section, and make one end fast at A E (Fig. 46); have a spring balance with adjusting screw S and stirrup D B. Hang a weight at W, and adjust the balance to show a reading which will equal W + w $(l - x)$, where w is the weight of the piece of wood per unit of length. The piece to the right of the stirrup is in equilibrium under two couples, namely, that of which one force is the weight shown by the spring balance, and the effective couple resulting from the pulls and thrusts of the cross-section at D B: these two couples are each equal to the bending moment at D B. The bending moment is the same at every part of the length x, and consequently the curve in x is circular. By moving the stirrup and balance to various positions, we find that as the bending moment is varied the curve alters. If we can measure the curvature in x, it is that due to the bending moment at the point B, when the piece is allowed to bend freely without the stirrup. Let B be the bending moment at D B, then $B = \frac{2p}{a} I$ (1), where p is the stress per unit of area in the outer fibres E D and a the depth of the piece. Let k be elongation of top fibres, $k = \frac{px}{E}$ (2). Now E D has become $x + k$, and the neutral line has remained x. Radii of circles are as their circumferences $\therefore \frac{x+k}{x} = \frac{r + \frac{a}{2}}{r}$, from which $r = \frac{ax}{2k}$ (3). From (2) and (3) we have $r = \frac{aE}{2p}$ (4); and from (4) and (1) we have $r = \frac{EI}{B}$. We may now substitute for B, $\left(W + w\left(\frac{l-x}{2}\right)\right)(l - x)$, in which w is the weight of a unit length of the piece.

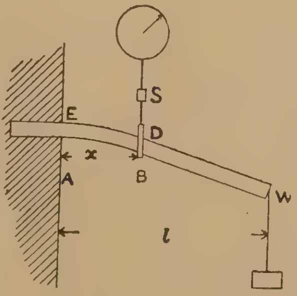


FIG. 46

It is easy to see that the deflection—that is, the fall of W—is great when r is short; that is: deflection $D \propto \frac{B}{IE}$, say $D = c \frac{B}{ba^3E}$ for beams of rectangular cross-section. From this equation it is seen that D varies inversely with the breadth of the beam (b), and inversely as the cube of the depth (a^3).

This is a most important practical result, and the student has not been asked to follow any but the most elementary algebra. Knowing that the deflection of a beam of uniform cross-section is inversely proportional to the moment of inertia (I) of the beam, a practical man could easily, after experimenting with a model, design a beam to carry a given load with a specified deflection.

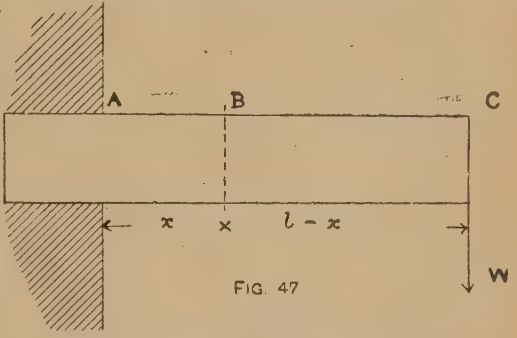


FIG. 47

Curvature is inversely as the radius of curvature; that is, if r is the *radius* of curvature, $\frac{1}{r}$ is the *curvature*.

41. From the equation $r = \frac{EI}{B}$ the formulæ for deflection of beams are easily deduced, but the operation involves higher mathematics. I take the following from Prof. Perry's "Applied Mechanics," pp. 405 409. For very flat curves curvature $\left(\frac{1}{r}\right) = \frac{d^2y}{dx^2}$. Strictly: $r = \frac{\left(1 + \left(\frac{dy}{dx}\right)^2\right)^{\frac{3}{2}}}{\frac{d^2y}{dx^2}}$.

Expand the numerator by the Binomial Theorem $\left(1 + \left(\frac{dy}{dx}\right)^2\right)^{\frac{3}{2}} = 1 + \frac{3}{2}\left(\frac{dy}{dx}\right)^2 + \frac{\frac{3}{2}\cdot\frac{1}{2}}{1\cdot 2}\left(\frac{dy}{dx}\right)^4 +$ &c. $\frac{dy}{dx}$ is the tangent of the angle which the tangent at any point on the curve makes with a horizontal line. The deflection in practical beams is so small that this angle is at any point very small, so small that $\left(\frac{dy}{dx}\right)^2 \left(\frac{dy}{dx}\right)^4$, and all higher powers may be neglected.

$$\frac{d^2y}{dx^2} = \frac{W}{EI}(l - x).$$

$$\frac{EI}{W}\frac{d^2y}{dx^2} = l - x. \text{ Integrate.}$$

$$\frac{EI}{W}\frac{dy}{dx} = lx - \tfrac{1}{2}x^2 + c, \text{ c but } c = 0.$$

Integrate again.

$$\frac{EI}{W}y = \tfrac{1}{2}lx^2 - \tfrac{1}{6}x^3 + c.$$

When $y = 0$, $x = 0$, and consequently $c = 0$,

$$y = \frac{W}{6EI}(3lx^2 - x^3).$$

This is the equation to the curve, A being the origin, A C the axis of x, x measured positive to the right, and y positive downwards.

To find the *Deflection* D or the drop of C, make $l = x$

$$D = y = \frac{Wl^3}{3EI}. \quad . \quad . \quad (1.)$$

When a beam is supported at both ends and loaded in the middle, imagine it turned upside-down to balance on the point C, the deflection at each end will be

$$D = \frac{\frac{W}{2} \cdot \frac{l^3}{8}}{3EI} = \frac{Wl^3}{48\,EI}. \quad . \quad . \quad (2.)$$

Beam fixed at one end and loaded uniformly.

$$B = \tfrac{1}{2}w(l^2 - 2lx + x^2)$$

$$\therefore \frac{2EI}{w}\frac{d^2y}{dx^2} = l^2 - 2lx + x^2.$$

$$\frac{2EI}{w}\frac{dy}{dx} = l^2x - lx^2 + \tfrac{1}{3}x^3 + c_1, c_1 = 0.$$

$$\frac{2EI}{w}y = \tfrac{1}{2}l^2x^2 - \tfrac{1}{3}lx^3 + \tfrac{1}{12}x^4 + c_2, c_2 = 0.$$

$$y = \frac{w}{24EI}(6l^2x^2 - 4lx^3 + x^4).$$

When $x = l$,

$$y = D = \frac{w}{24EI}(6 - 4 + 1)l^4 = \frac{w}{8EI}l^4;$$

r if we take $W = lw$,

$$D = \tfrac{1}{8}\frac{Wl^3}{EI}. \quad . \quad . \quad (3.)$$

Beam supported at both ends and loaded uniformly. Moment at C $= \frac{w}{2}\left(\frac{l^2}{4} - x^2\right)$.

$$\frac{2EI}{w}\frac{d^2y}{dx^2} = \frac{l^2}{4} - x^2,$$

$$\frac{2EI}{w}\frac{dy}{dx} = \frac{l^2}{4}x - \tfrac{1}{3}x^3,$$

$$\frac{2EI}{w}y = \frac{l^2}{8}x^2 - \tfrac{1}{12}x^4.$$

Let $x = \frac{l}{2}$, then $\frac{2EI}{w} = \frac{5l^4}{192}$,

$$D = \frac{5Wl^3}{384EI}. \quad . \quad . \quad (4.)$$

The above applies to beams of uniform cross-section. We see from the equation $\frac{1}{r} = \frac{B}{EI}$ that in beams in which $\frac{B}{I}$ is a constant quantity the curve of the beam is a circular arc.

The number E for any material may be found experimentally; referring the deflection observed to any of these values, perhaps the best to use is (2).

42. I have shown, section 36, how to calculate the *moment of inertia* of a *rectangle* about an axis through its centre and parallel to a pair of sides.

The moment of inertia of a thin plate about an axis at right angles to it is equal to the sum of the moments of inertia about two axes on the plate at right angles to one another and intersecting at the point where the first axis meets the plate (Fig. 51).

Take a small element p. Its moment of inertia about O X is py^2, and about O Y px^2, but $x^2 + y^2 = r^2$, and pr^2 is its moment of inertia about an axis through O at right angles to the plane of Y O X. The circle, Fig. 52, is divided into concentric rings, each of the very small breadth δ. Suppose a ring to have its mean circumference at the distance δ from O, the centre of the circle, its area is $2\pi\delta^2$, its moment of inertia about O is $2\pi\delta^4$. The next ring has for area $4\pi\delta^2$, and its moment $4 \cdot 2^2\pi\delta^4$. The area of the next ring is $6\pi\delta^2$, and its moment is $6 \cdot 3^2\pi\delta^4$. The sum of these moments

$$\Sigma = 2\pi\delta^4(1 + 2^3 + 3^3 + 4^3 + \&c. + n^3)$$

$$= 2\pi\delta^4\left(\frac{n(n+1)}{2}\right)^2.$$

Now, by taking n large enough, δ may be made smaller than any assigned quantity, however small, and the above sum becomes $\frac{1}{2}\pi R^4$. Since in this case the moments of inertia about two diameters at right angles are equal, I about one diameter $= \frac{1}{4}\pi R^4$.

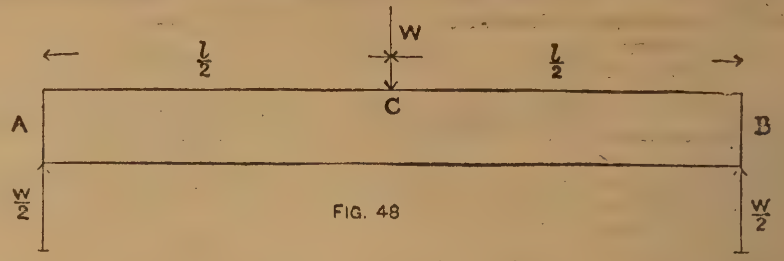


FIG. 48

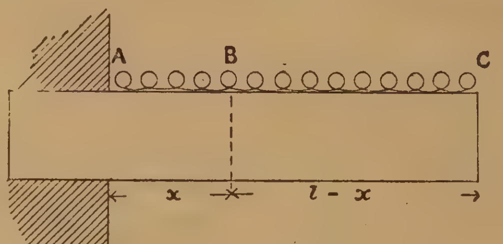


FIG. 49

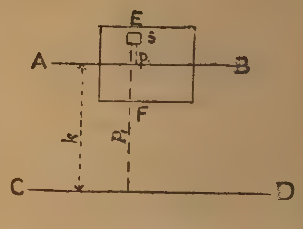


FIG. 53

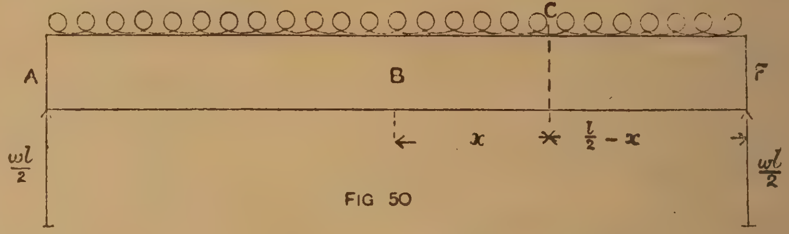


FIG 50

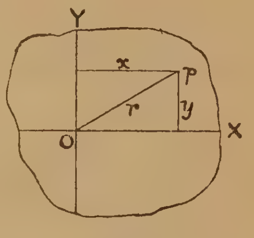


FIG. 51

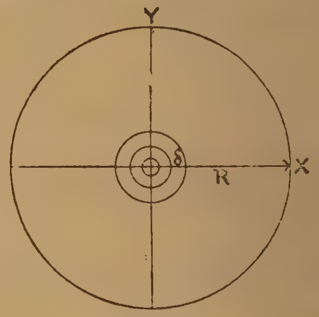


FIG. 52

The moment of inertia (J_2) of an area about any axis parallel to an axis through its centre of gravity is equal to the moment of inertia about the axis through the centre of gravity (J_1), together with the product of the area and the square of the distance between the two axes $J_2 = J_1 + \Delta k^2$.

Referring to Fig. 53, consider the element of area s in E F. Its moment of inertia about A B is sp^2, its moment about C D is sr_1^2,

$$\text{now } r_1^2 = k^2 + p^2 + 2pk.$$

$$\therefore sr_1^2 = sk^2 + sp^2 + 2spk,$$

$$\text{and } \Sigma sp_1^2 = \Sigma.sk^2 + \Sigma sp^2 + \Sigma.2spk,$$

$$\text{but} = sp = 0 \therefore \Sigma 2spk = 0;$$

$$\text{and } J_2 = K^2 \text{ area EF} + J_1.$$

43. Compare the rough practical calculation of the strength of a rolled joist with the more careful exact calculation (Fig. 54). At 4 tons per sq. in. area of flange 3 sq. in. × 4 tons × 1 ft. B M = 12: the joist will bear a maximum bending moment of 12ft. tons.

By the more exact method B M $= \frac{2p}{d}$I, B M $= \frac{2p}{d}\,\frac{bd^3 - b_1d_1^3}{12}$. Take these dimensions in feet:

$$BM = 2 \times 4 \times 144 \times \left[\frac{\frac{1}{2} - \frac{11}{24} \times \left(\frac{11}{12}\right)^3}{12}\right]$$

$$= 4 \times 12 \times \left[1 - \left(\frac{11}{12}\right)^4\right]$$

$$= 4 \times 12 \times \frac{6095}{20736} = \frac{6095}{432} = 14\text{ft. tons.}$$

Where the web is deep and thick compared to the breadth and thickness of the flanges, it is advisable to calculate exactly.

The moment of inertia for a rectangle about a line through its centre parallel to its breadth we found to be $I = \frac{bd}{12}$, where b = breadth and d = depth of the rectangle. The moment of inertia of a cross-section (Fig. 55) is the difference of the moments of the outer and inner rectangles. If this figure is cut vertically, and the two parts placed as in Fig. 54, it will form a cross-section of a I rolled joist $I = \frac{bd^3 - b_1d_1^3}{12}$.

I use this value above.

(*To be continued.*)

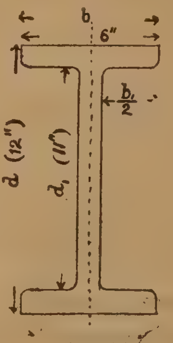


FIG. 54

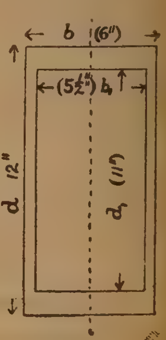


FIG 55

Correspondence.

The Trend of Modern Architecture.

To the Editor of The Builders' Journal.

Sir,—Though somewhat late in the discussion, I should like to make a few remarks relative to the proposed cathedral for Liverpool, more especially in regard to the paper by Professor Simpson published in your issue for October 16th.

Do we really admit that no Gothic architect ever equalled Brunelleschi? Do we adopt Michael Angelo's view of the master's work at Florence and reject altogether the late Mr. Ferguson's? Surely Giotto, Tenanti, De Montereau, and others named by the Professor, had as much ability, and their work was of equal beauty and originality. Passing in mental review the most important Renaissance cathedrals, is there one that surpasses in beauty those of the Middle Ages, whether in French or English Gothic—or say "Pointed" if we have none such, properly so-called?

We may admit the originality of St. Peter's at Rome—*i.e.*, its gigantic scale—while we recognise that it imparts *per se* no beauty, and is altogether a mistake, inasmuch as all proportion is lost. Quite apart from its being exotic, we had undoubtedly grown to admire St. Paul's; but I scarcely think there is any intense desire to repeat its cheerless gloomy solidity. The egotistical school of designers has lately worked its will, but we bow not down to them yet, over the mosaics or the glass. Though we may picture in fancy the splendour of Mr. Bentley's fine exotic in Tothill Fields, with all its novelty on English soil, we would surely not desire a repetition of it at Liverpool.

In civil and domestic work there is a spirit of restlessness abroad which may indicate a real desire for progress; but, on the other hand, may breathe the spirit of the ancient Athenians which evoked the Pauline rebuke. Restless and bizarre phases have come and gone, *e.g.*, the chamfered style of the old Strand Music Hall, and a queer front in Oxford Street, both of which will soon be a mere memory. It was simplicity *in excelsis* compared with some recent work in restaurants and public-houses, in which there is hardly a quiet point of surface whereon the eye can rest. In the chaster designs of some of our leading men a late Perpendicular type is adopted which to the most enthusiastic Goth is comparatively unsatisfying and poor; and where a flowing line for tracery is adopted it is worse, for it is after such a decadent type as Saint-Eustache, Paris, rather than the strong geometrical lines of Exeter or Wells Cathedrals.

Then the present trick adopted for gaining pseudo-picturesqueness by tacking a Renaissance morning-chapel on to a Perpendicular chancel is to be deprecated, though some of the younger men seem to think it shows individuality. Originality may surely become a fetish if pushed to extremes. Roslin chapel is original, but, compared with Merton College or even Henry VII.'s Chapel, is scarcely a type to be repeated in the present age.

One is obliged to go outside of England to find an example of very bizarre work, so chaste is our National Gothic, even its latest phase of redundant panelling. Originality is evidenced in French design such as the Petit Palais and Grand Palais of the Paris Exhibition of 1900, but is it possible that an English architect would long ponder these buildings? As further evidence of the search for novelty, is it not the case that to Spain the architect looked for inspiration for the most important buildings of the Glasgow Exhibition this year? *

Without being so blunt as to speak of "dying nations" we may fairly consider whether their architecture is not moribund, when some of us are found speaking of our noble national style as being dead.

Our lovely city of Oxford and other towns are being defaced by poor heavy examples of Queen Anne and Georgian work, by no means original and entirely out of harmony with the old buildings, while it is far from indicating the spirit or aim of the present age, if it be individuality.

In rural architecture the low Dutch type of house, covered with rough-cast, heavily buttressed at the angles, long low draughty windows, squat doors and a green water-butt guarding the side entrance, is too much the vogue; and if you can only get a yew-hedge to cut into a large egg with a small fowl on the top of it, you have the *ne plus ultra* of a book of bungalows designs so much in demand by students.

Why it should be dubbed "clever forgery" to take inspiration for a cathedral from the Angel Choir at Lincoln, and "clever originality" to take Staples Inn or the stables at Hampton Court for a gentleman's country-house, I have never been able to see. Amateurs are showing the same tendency, as witness an extraordinary *olla podrida* in Oakley Street, Chelsea, where a house front has been some years under process of applied features whose effect is a terrible shock to the beholder.

When the original genius appears who is to transfigure "dead" architecture—for if Gothic be dead, Classic is not less so—we will welcome him with open arms.—Yours truly,

E. W. HUDSON, A.R.I.B.A.

Building Construction.

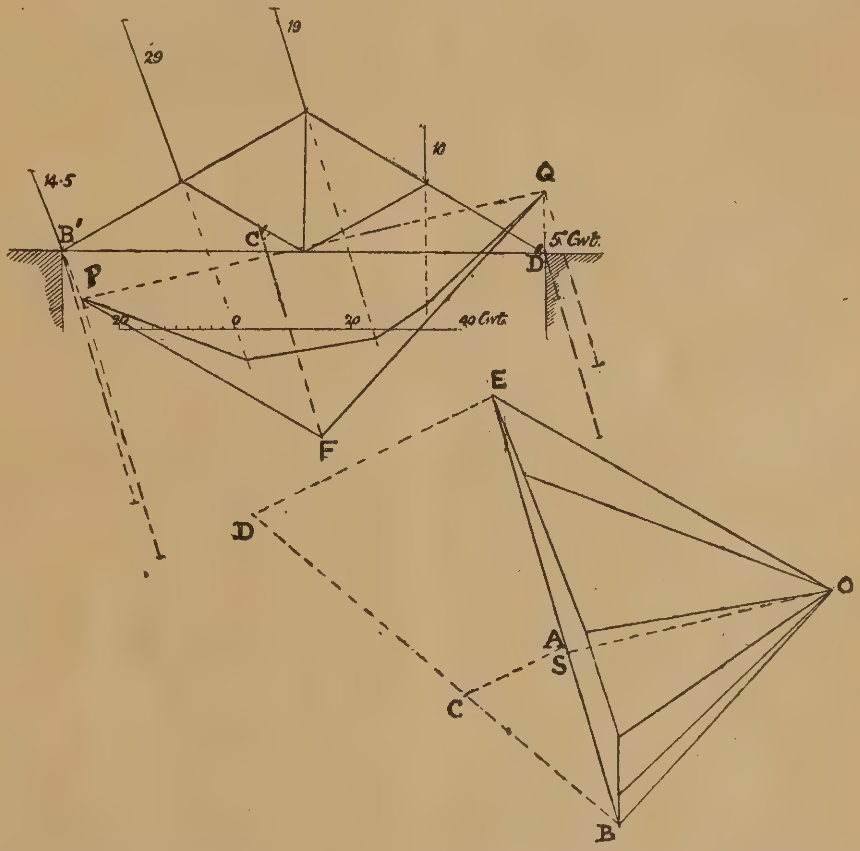
To the Editor of The Builders' Journal.

Sir,—In the article on "Building Construction" in your issue for October 30th the author says on p. 203, column 2, five lines from the bottom: "The point O has been chosen . . . . to show in a marked manner that the point A cannot be found by drawing a line through O parallel to the line joining P and Q . . . . In the case where the loads are *all* vertical the point is found by drawing a line from O parallel to P Q."

Now, in the example he refers to earlier in the chapter (namely, question 45, South Kensington, subject III.), which is shown worked out on p. 405 of your issue of June 26th last, in which the loads are *not* all vertical, the apices of the funicular polygon *are* shown joined by a dotted line; and the point A (dividing point between the reactions) has apparently been found by the method he states in the above-mentioned article to be wrong—otherwise why was a dotted line shown in that position at all? It seems that one or other must be wrong.

Also, are these examples intended to have a possible practical application, or are they merely theoretical exercises? If they are intended to be practical, why are some of the loads on a roof truss assumed to act at an inclination other than 90 degs. to the roof-surface or vertical loads? It seems that a roof can only be exposed to two forces, namely, a dead load (such as framing, roof-covering and snow) and wind-pressure, the dead load acting vertically and the wind-pressure usually horizontally, though generally resolved normal to the roof-surface (by multiplying by the cosine of the angle of inclination). Thus the forces acting on a roof must be either vertical or normal to the roof-surface, and in practice no other conditions can arise. I should therefore be glad to know why in this article are loads assumed which act at various angles, such being an impossibility in practice, as the wind never blows at an angle but a few degrees removed from the vertical, and yet some of these examples assume a similar angle.—Yours truly,

PERPLEXED.



In reply to the queries of "Perplexed":—

(1) When the loads are transferred to the string, the string may be supposed to be attached at P and Q to the ends of a strut P Q. The dotted line O S represents the stress in this strut, and the lines B S, S E, represent parallel reactions at Q and P respectively, which would support the strut and string with their applied loads. Now, suppose P and Q to be rigidly fixed to the truss. We have to apply at B' and D' parallel forces which will do the same duty as the forces at P and Q. The line C' F is the resultant (not in magnitude in the figure) in position of the forces at P and Q; it is also that of the forces to replace these, to be applied at B' and D', and the point C' is where it intersects the line B' D'.

$\therefore \frac{\text{Force at } B'}{\text{Force at } D'} = \frac{D'\,C'}{C'\,B'}$; the line B E is cut at A in this proportion: $B\,C = B'\,C'$, $B\,C = B'\,C'$, and C A is drawn parallel to D E. If the point O is chosen so that S O will be nearly parallel to B' D' the point S will very nearly coincide with the point A. The point A is not *found by the dotted line*. The difficulty of "Perplexed" shows that it was necessary to give the warning to which he refers.

(2) These examples are intended to be fairly practical. The loads about which "Perplexed" asks are the resultants obtained by compounding the vertical loads with the wind loads at the several points. They are, consequently, neither vertical nor at right angles to the line of rafter.

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* In our own Exhibition buildings nothing has ever come up to that of 1851 in expressing its purpose and providing for requirements. The very features in Captain Foukes' subsequent building that met with the objections of architects of that day are now adopted. It is this uncertainty of estimate of what is true architecture that causes our criticisms to be unheeded and makes the public indifferent.

Keystones.

The Nave of St. John's Church, Gainsborough, Lincolnshire, is to be lengthened by three bays, at an estimated cost of over £2,000.

A New Village Institute at Frensham has been opened. It is built of red bricks with a tiled roof. Mr. G. B. Carter, of London, is the architect, and Mr. Andrew Chuter, of Frensham, the builder.

A Bronze Mural Tablet has been placed in the hall of the Bridgend Institute to the memory of the late Mr. Andrew Coates, of Pitcullen. It has a green marble framing. It was carried out under the direction of Mr. David Smart, architect.

Llanrothal Church has been restored under the direction of Mr. Clark, of Hereford. Part at least of the existing building is Norman, the very small window in the north wall deeply splayed inside being obviously in that style. The windows in the south wall of the nave, the east window and the chancel arch are Early English in character, and the small high west window may probably belong to the Decorated period. A large four-light late fourteenth-century window has been inserted in the south wall of the chancel.

Wolverhampton Art Gallery and the Exhibition.—The tender of Messrs. George Cave & Son, builders, Wolverhampton, amounting to £320, for the execution of work in the shape of repairs to the roof of the Art Gallery, has been accepted by the Town Council. The International Exhibition Committee having found it impossible to erect a satisfactory building in which to house the art collection, the present scheme has originated. The Art Gallery is to be decorated, towards the cost of which the Exhibition Committee has granted £1,500, in addition to £500 for the roof repairs. Thus money will not have to be spent on a temporary building, but on a permanent object for the benefit of the town.

The Parish Church of Kidderminster is being restored, and the oak roofs which have been erected in the north and south aisles were dedicated recently. Since the year 1847 it is estimated that over £30,000 has been expended in the work of restoration. The oldest part of the present church is the chancel; but that cannot be ascribed to any period earlier than the reign of Edward I. (1272); while the beautiful tower, which originally stood by itself, is not earlier than the time of Edward III. (1327). The nave, connecting the two, was built later still. The work which has now been carried out will cost over £800. The ceilings are constructed of solid oak, moulded and panelled. The whole of the work has been carried out by Messrs. Collins & Godfrey, of Tewkesbury, from drawings and specifications and under the superintendence of Messrs. J. A. Chatwin & Son, of Birmingham.

An Architect's Exciting Experience.—At Bow Street Police Court last week a man named William Edge, aged twenty-five, and described as a student, was charged with threatening Mr. James Neale, architect, of Bloomsbury Square, with a revolver. It appeared that Edge visited Mr. Neale's office last Thursday, and when informed that a certain flat which he desired was not to let, said: "You are now in my power. We are alone. There is no one else in the other offices." He then produced a revolver and pointed it at Mr. Neale's head, saying, "If you move one step towards the door I'll fire and kill you." Mr. Neale, taking a seat, said: "Don't be a fool, man." Edge then produced and made Mr. Neale sign a certain letter of apology for an alleged insult. Having placed the letter in an envelope and addressed it, Mr. Neale handed it to Edge, and in doing so touched the button of a private telephone at his side. Edge noticed the action, and exclaimed: "Ah! you rang that bell. I now fire." He did not do so, however, but continued: "You needn't ring. We are all alone." At that moment a clerk named Henderson came in, and Edge then put the revolver in his pocket. Mr. Neale immediately got hold of him by the throat, and after a struggle Henderson got the revolver from him and threw it away. Edge was perfectly sober. No bail was allowed.

New Institute at Chopwell has been erected by the Consett Iron Co., Ltd., for their workmen.

St James's School, Lower Darwen, is being extended from plans by Mr. Fred J. Parkinson, architect and surveyor, of Blackburn. Messrs. Lloyd & Sons, of Darwen, are the contractors.

Mr. A. J. B. Ward, of Messrs. B. Ward & Co., Ltd., of 38 and 39, Parliament Street, Westminster, S.W., the well-known makers of various pavings, fireproof floors, staircases, &c, died on November 7th and was buried at Newcastle on November 12th.

Partnership Dissolved.—The partnership lately existing between Messrs. Robert Clamp and J. B. Drower, architects, of Woking, Surrey, and Fleet, Hants, has been dissolved. The practice at Woking will in future be continued by Mr. I. B. Drower, and that at Fleet by Mr. R. Clamp, separately.

Liverpool Cathedral.—In reply to Mr. T. Myddelton Shallcross, Sir William B. Forwood says that "the site has been definitely fixed at St. James's Mount, and no alteration will be made. The foundations have been proved, the levels are now being taken, and in due course a plan will be at the disposal of architects."

A New Chancel Screen at St. Nicholas Church, Bristol, has been erected. The screen has a base of Bath stone, ornamented with six panels, each of which has a shield. Immediately opposite the centre aisle of the nave there are double gates of wrought-iron. The top part of the screen is composed of wrought-iron, worked with arcading, capped by a figured border. The decoration is being carried out by Messrs. Joseph Bell & Son, of 12, College Green, under the direction of the architect, Mr. W. V. Gough, Bridge Street, Bristol.

The Birmingham Homœopathic Hospital is being extended. Messrs. Crouch & Butler, of Newhall Street, Birmingham, have made designs in keeping with the existing premises. Addition will be made to the ward accommodation, and the hospital, when the new wing is completed, will be able to provide beds for forty-two patients. But the extension applies principally to what is technically termed the "administrative block," and here better provision is being made for the staff. The extensions will cost about £5,000.

A War Memorial at Bristol is to be erected in College Green. Mr. Fred W. Marks, architect, of London, has prepared the design, which is an obelisk consisting of a bold shaft of Swedish red polished granite, with finely axed decorative fluting and ornamental design on the lower part of its sides. The base on which the shaft will rest is to be of polished green granite, and this in turn will stand on grey granite steps, finely axed. Its site is to be surrounded by twelve grey granite posts, connected by heavy bronze chains. The obelisk will be 41ft. in height from ground level to the top, and will occupy an area of 13ft. sq. It will cost £4,000.

Architecture at the Yorkshire College, Leeds.—When the Council of the Yorkshire College have inaugurated two or three important schemes which they have in hand, they will probably turn their attention to the subject of architecture. The college curriculum at present includes a course for architectural students, but what Principal Bodington has in view are full courses dealing with architecture in its historical, artistic and utilitarian aspects. It is suggested that the architects of Yorkshire, following the example of the lawyers, should start a movement to raise the funds necessary for giving their profession a recognized status at the college.

The New Offices for the Guardians of the Hartlepools, erected at the cost of £6,972, including site and furnishings, were formally opened last week. The building is plain, occupying a site 60ft. wide and 130ft. long, situated in Hart Road and Tees Street, West Hartlepool. It is faced with red Accrington pressed bricks with stone dressings. On the ground floor is a committee-room with suite of clerks' offices and strong room adjoining, two offices for relieving officers, waiting-room, vaccination officer's room, sample room, &c. Upstairs is the board-room, cloak-rooms, surveyor's office, caretaker's apartments, &c. The building is lighted throughout by electricity. Mr. J. J. Wilson, of West Hartlepool, is the architect, and Messrs. Gradon & Son, of Durham, are the builders.

The Temple Church.—The stonework of the Temple Church, both on the exterior and in the porch, has been found to be in a serious state of decay lately, and it is understood that steps will shortly be taken to repair it. The stonework of this church, which is over 700 years old, was last restored in 1842.

Mr. Joseph Grimshire, who a month ago was exploring Sicily with characteristic energy, was buried in Abney Park Cemetery on Saturday last. Although a successful manufacturer in London for half a century, he studied and travelled amidst the ancient cities of Western and Central Europe, formed a large collection of books, pictures, photographs and prints dealing with old buildings, and gave many illustrated lectures to antiquarian and ecclesiological societies. He rarely met an architectural student without offering him encouragement in some practical form.

The Song of the Carvers in the Exeter studios of Messrs. Harry Hems & Sons so impressed the Rev. Robert S. Routh, the Hampshire poet, whilst recently visiting them, that he could find no rest till he has set in verse his "Thoughts on the Woodcarver's Song." Writing to the local newspaper he says: "The poet you keep on the premises would no doubt have done it much better, but it is a relief to me to pour out my soul." And so we are told that the carver's song is "as the sea-beat on the strand . . . . rising like the billow's roar." We are wondering what the carvers think!

The British Fire-Prevention Committee.—Mr. Edwin O. Sachs, chairman of this Committee, will read a paper on "Fireproof Construction" before the Royal School of Military Engineering at Chatham to-morrow, the date being selected as near as possible to the anniversary of the great Cripplegate Fire of 1897, which, it will be remembered, took place on the afternoon of November 19th. Mr. Ellis Marsland will read a paper on the Committee's work before the Insurance and Actuarial Society of Glasgow on December 9th. Mr. Marsland is the master of the Tylers' and Bricklayers' Company for the current year.

The Executive Committee of the National Trust protests against the erection of a barbed wire fence in proximity to Stonehenge. It has also resolved to make a public appeal for £150 in order to complete the purchase of the picturesque fourteenth-century cottage at Tintagel, known as the "Old Post-Office." The structure has been offered to the Trust for £200, of which sum £50 has already been subscribed. It is reported that the Old Jacobean Cloth Hall at Newbury is to be preserved, and that a local committee has been formed for the purpose of purchasing and repairing the building and converting it into a museum and art gallery.

Overhanging Lamps and Signs.—Certain by-laws are proposed to be made by the London County Council for "the regulation of lamps, signs or other structures overhanging the public way, not being within the City." They will be administered by the borough councils, to whom they have meanwhile been submitted for consideration. A special committee of manufacturers and traders in the principal businesses in London was formed under the auspices of the Chamber of Commerce to examine the proposed by-laws, and they report that they object to the provisions involving the special "sanction" of the local authority in matters of everyday necessity and established custom, except so far as may be necessary for the public safety.

The T-Square Club opened its second season on Wednesday last with a smoking concert in the Crown Room at the Holborn Restaurant. Mr. E. W. Mountford presided. The programme was an excellent one, the feature of the evening being Mr. W. H. Squire's 'cello solos. The vocalists Mr. Bantock Pierpoint and Mr. Whitworth Mitton were well received, and clever musical sketches were given by Mr. Charles Frood. Mr. Wilson James and Mr. Edward Barwick furnished humorous items, and sleight-of-hand tricks and ventriloquism by Mr. John Warren caused much amusement. Mr. Alfred Smythson was the pianist. The address of the secretary of the club, Mr. T. Wilson Aldwinckle, is now St. Andrew's, Mitcham Park, Mitcham Surrey.

An Exhibition of Pictures at the Doulton Institute is on view during this week. They are by past students of the Lambeth School of Art, which for many years had close relation with the art work of Messrs. Doulton's establishment. In addition to the pictures, there is also shown a collection of vases and other objects worked, in their hours of recreation, by men engaged at the Doulton potteries.

The Bristol Society of Architects held a meeting last week, Mr. Frank Wills, president, in the chair Mr. John Fisher, head-master of the Kensington School of Art, Clifton, read a paper on "The Life and Work of Alfred Stevens," dealing with the early struggles and training of the great sculptor, painter and designer, whose life work culminated in the magnificent monument in St. Paul's Cathedral (unfortunately still incomplete) to the great Lord Wellington.

The Chancel of All Saints' Church, Hundon, has been restored. The repairs were effectually carried out under the direction of Mr. Fawcett, of Cambridge, by Mr. W. Bareham, of Clare, the woodwork being undertaken by Mr. Cowle, of Clare. An entirely new roof has been constructed, and four new traceried windows with cathedral glass have been erected. The new gable of flintwork is surmounted by a new cross, this and the windows being of Ancaster stone. The walls of the chancel have been scraped, cleaned and coloured a dark red, and will be completed with stencil decoration. The interior of the roof has a framework of English oak, and is filled in with plaster panels.

Restoration at Exeter.—The Custos and College of Vicars of Exeter Cathedral started a fund for the restoration of the College Hall in South Street. The hall was built by Bishop Brantyngham in 1388 as a refectory or dining hall for the vicars choral of the cathedral, then twenty-four in number, now twelve. The same benefactor also completed the buildings in Calendar Hay, near by where the vicars resided in chambers until about the beginning of the last century. The hall has undergone necessary repairs from time to time, the last about sixty years since, but there have been no structural alterations. About £120 is required, towards which nearly one-half has been promised.

New Buildings at the Hereford County and City Asylum at Burghill were opened recently. Messrs. Giles, Gough & Trollope were the architects. The additions consist of a two-storey block for 100 females and a one-storey block for 50 males, for epileptics, matron's and medical officers' rooms, attendants' mess-rooms, large additions to the dining-hall and chapel, and an extension of the kitchen. In addition, the laundry block has been entirely remodelled and large additional accommodation provided. The main building contract has been carried out by Messrs. W. Bowers & Co., of Hereford. Mr. J. C. M. Vaughan, Fellow of the Institute of Decorators, of Hereford, has had the contract for the whole of the decorations and painting.

Engineering Notes.

The New Line of the City and South London Railway Company, from Moorgate Street to Islington, was opened for public traffic last Sunday morning.

The Surveyors' Institution held its first ordinary meeting of the session last week. Sir John Rolleston delivered his presidential address, which dealt chiefly with agricultural rating.

A New Stone Bridge at Dryslwyn over the Towy, which has cost the Carmarthenshire County Council nearly £12,000, was opened recently. The bridge has been erected near the railway station and immediately above are it the ruins of Dryslwyn Castle. Mr. Thomas Codrington, C.E., of Twickenham, ex-inspector of the Local Government Board, was the engineer. It was found necessary to go down nearly 60ft. in the bed of the river for the foundations of the north pier. The bridge, which is somewhat ornamental, is 17ft. wide and built of local limestone from Castellgarreg, Maesybont. It has three spans, the middle one being 57ft. and the two side arches 25½ft.

Surveying and Sanitary Notes.

The Board of Trade and Street Upheavals.—The Westminster City Council has revoked its resolution of October 24th in favour of the County Council, substituting the Board of Trade as the appeal authority in all disputes relative to the breaking up of roads.

Bacterial Sewage Purification at Skipton.—The Skipton Urban Council, having been pressed by the West Riding Rivers Board to improve the purification of the town's sewage, have been recommended by their surveyor (Mr. J. Mallinson) to adopt a scheme of treatment on the bacteriological principle, and further means of land filtration. The Council have decided to consult Mr. Mawby, borough engineer, of Leicester.

The Sanitary Assurance Association.—At the monthly meeting of the Council of the Sanitary Assurance Association, held at No. 5, Argyll Place, Regent Street, W., last week, Mr. Andrew Stirling in the chair, the death of General H. K. Burne, C.B., was reported; and on the motion of Sir Vincent H. Kennett Barrington, seconded by Mr. W. S. Halsey and supported by Dr. Willoughby and Mr. Mark H. Judge, a resolution was adopted acknowledging the services which General Burne rendered to the Association during the seventeen years he was a member of the Executive Council.

Builders' Notes.

Mr. Edward Noble, builder and contractor, of Spring Street, Rishton, died recently at the age of fifty-seven years. During the past few years Mr. Noble has been responsible for the greater number of the new houses erected in Rishton, and one of the streets is named after him, "Noble Street." He was one of the largest property owners in the township.

Building in Bradford.—The Building Committee of the Bradford Corporation during the twelve months ending August 31st last approved 445 plans out of 1,160 deposited. Included in the plans approved were 1,145 dwelling-houses, twenty-one houses and shops, twelve warehouses, four mills, sixteen workshops, two places of worship, twenty-five lock-up shops, fifty-four streets and ninety-two back roads. Plans were also approved for five board schools, two poor-law relief stations, two tall chimney shafts, and the electricity generating station. There was more activity in the building trade than in the previous year, but less than in either 1898 or 1899.

London County Council.—At last week's meeting the following recommendations of the Highways Committee were approved: "That the Council do apply in the next session of Parliament (1) for powers to make subways in streets for the reception of pipes, wires and other things where desirable, and for electrical traction and other purposes of locomotion; and (2) powers to construct a subway and to construct tramways therein for electrical traction from the Victoria Embankment, along Wellington Street, across the Strand, through the new street thence to Holborn, under Holborn and Southampton Row, and to take such tramways, by an inclined plane, to the tramways terminus in Theobald's Road, or to the tramways authorised to be constructed in Rosebery Avenue, as may be considered most expedient." It was also agreed to make an application in the next session of Parliament for power to construct an underground conduit system of electric traction for the County Council tramways at Camberwell Green via Denmark Hill, Champion Park, Grove Vale, and Lordship Lane to the Crystal Palace Road. The length of the new line will be 2½ miles, and the cost of construction £68,650. The street widenings required will cost £114,950. Subject to the Lee Conservancy Board contributing £5,000, it was decided to rebuild Bow Bridge at an estimated cost of £21,200. The tenders of Messrs. Dick, Kerr & Co., Ltd., for plant at £25,964 and £46,625, necessary in the electrification of the South London tramways, were accepted.

Building in Glasgow.—New work to the value of £50,000 was passed last week at Glasgow Dean of Guild Court.

The New Cottage Hospital, Cranleigh, is being warmed and ventilated by Shorland's patent Manchester stoves and grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A Builder's Bankruptcy: Liabilities nearly £128,000.—In the Court of Bankruptcy last week a first meeting of creditors of W. G. Hornsey was held. The debtor, who was described as of 205, Vicarage Lane, West Ham, builder, furnished a statement of affairs showing gross liabilities £127,874 11s. 5d., of which, however, £9,337 8s. 7d. only was returned as expected to rank, and assets, consisting of cash 5s. 9d. and an estimated surplus of £67,093 7s. 11d. from securities held by creditors. It appeared that the debtor began business as a builder in 1881, and in 1887 built the Premier Hotel, Piccadilly, and the Marlborough Hotel, St. James's, at a cost of £95,000, most of which was raised on mortgage. The debtor attributed his failure to inability to realise shares in a brewery at Kempton and in hotels. No offer of composition was now made to the creditors, and Mr. John Woodthorpe, chartered accountant, was nominated as trustee to wind up the estate, with the assistance of a committee of inspection.

COMING EVENTS.

Wednesday, November 20.

Ruskin Society of Birmingham.—Mr. Howard S. Pearson on "The Pathetic Fallacy," 7 45 p.m.

Northern Architectural Association.—Students' Evening.

Dante Society. Lecture by Dr. Hodgkin, 3 p.m.

Society of Arts.—Opening Address by the Chairman of the Council, Sir William Henry Preece, K.C.B., F.R.S., 8 p.m.

Thursday, November 21.

Royal Academy.—Demonstration in Anatomy: The Trunk and Upper Extremity. By Prof. Arthur Thomson, M.A., 4 p.m.

Royal School of Military Engineering, Chatham.—Mr. Edwin O. Sachs, on "Fireproof Construction."

Friday, November 22.

Architectural Association: Discussion Section.—Mr. G. H. Smith, on "The Architectural History of Canterbury Cathedral." 7.30 p.m.

Glasgow Technical College Architectural Craftsmen's Society.—Mr. George Herbertson on "Foreign Competition in the Building Trades," 8 p.m.

Birmingham Architectural Association.—Mr. J. A. Gotch, F.R.I.B.A., on "Architecture of the Eighteenth Century in England."

Saturday, November 23.

British Institute of Certified Carpenters. Visit to Vauxhall Bridge Works at 3 p.m., by permission of the resident engineer, Mr. E. P. Wells.

Monday, November 25.

Surveyor's Institution.—Mr. A. Dudley Clarke, on "The Final Report of the Local Taxation Commission," 8 p.m.

Royal Geographical Society.—Major Molesworth Sykes, on "Four Years' Travel and Survey in Persia," 8.30 p.m.

Royal Academy.—Demonstration in Anatomy: The Upper Extremity. By Prof. Arthur Thomson, M.A., 4 p.m.

Tuesday, November 26.

Royal Colonial Institute.—Mr. W. Gibbons Cox, on "The Water Supply of Australia," 4.30 p.m.

Institution of Civil Engineers.—Mr. William Naylor, A.M., I.C.E., on "The Treatment of Trades' Waste Bacterially," 8 p.m.

Wednesday, November 27.

Society of Arts.—Mr. J. Gordon Parker, on "Leather for Bookbinding," 8 p.m.

Northern Architectural Association.—Council Meeting at 6.45 p.m. Lecture by Mr. Henry S. Kerr at 7.30 p.m.

City of London College Science Society.—Mr. E. R. Calthrop, M.I.M.E., on "Narrow Gauge Light Railways of Heavy Traffic Capacity," 7.30 p.m.

Thursday, November 28.

Society of Architects.—Presidential Address by Mr. Silvanus Trevail, F.R.I.B.A., 8 p.m.

Royal Academy.—Demonstration in Anatomy: The Lower Extremity. By Prof. Arthur Thomson, M.A., 4 p.m.

Friday, November 29.

Architectural Association.—Mr. A. Mitchell will read Mr. Francis Bond's paper on "Capitals," 7.30 p.m.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Nov. 21	London, E.C.—Building Materials	London General Omnibus Co., Ltd.	Coach Factory, 235 Upper Street, Islington, N.
" 21	Rishworth, near Halifax—Rebuilding Paper Mills	—	R. Horsfall & Son, Architects, Commercial Street, Halifax.
" 21	Wallasey—Offices for Tramways Department	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 21	Redhill—Business Premises	Market Hall Co., Ltd.	Clayton & Black, 152 North Street, Brighton.
" 21	Lancaster—Steel or Iron Car Shed	Tramways Committee	T. C. Hughes, Town Clerk, Town Hall Lancaster.
" 22	Newbridge, near Ruabon—House, Out-Offices, &c.	—	W. H. Johns, Architect, Vroncyssyllte, Llangollen.
" 22	Ystalyfera and Pontardawe Wales—Schools	Llanguicke School Board	W. W. Williams, 63 Wind Street, Swansea.
" 22	London, E.C.—Slates, Blue Bricks, Cement, Stone, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
" 22	Warley, Halifax—Alterations and Additions to Hospital	—	M. Hall, 29 Northgate, Halifax.
" 23	Askam-in-Furness, Lancs—Two Houses	Mr. Nansen	Mr. Cowley, 10 Marsh Street, Askam-in-Furness
" 23	Great Bentley, Essex—Alterations, Repairs, &c., to Chapel.	Wesleyan Connexion	C. E. Butcher, 3 Queen Street, Colchester.
" 23	Shettleston, Glasgow—Waiting-room and Workman's House.	Lightburn Joint Hospital Committee	A. Cullen, Architect, Branden Chambers, Hamilton.
" 23	Swindon—Brick Gasholder Tank	Gas Company	J. J. Jervis Secretary, Gas Offices, Queen Street, Swindon.
" 23	Leeds—Free Library	Library Committee	W. Bakewell, 38 Park Square, Leeds.
" 23	Cwmaman—Eighteen Houses	Cottage Co., Ltd.	J. Ll. Smith & Davies, Architects, Aberdare.
" 23	Horsham—Five Houses, Shop and Stabling	—	W. Buck, Architect, Horsham.
" 23	Oswestry—Sanitary Convenience	Town Council	G. W. Lacy, Borough Surveyor, Guildhall, Oswestry.
" 25	Dublin—Alterations and Repairs to Public Baths	Corporation	City Architect, Municipal Buildings, Cork Hill, Dublin.
" 25	Horwich—Infectious Diseases Hospital	Hospital Committee	T. Partington, 117 Market Street, Westhoughton, Bolton.
" 25	Littlemore—Additions to Asylum	Committee of Visitors	County Surveyor, Oxford.
" 25	Middlesbrough—County Court	Commissioners of H.M. Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
" 25	Felling, Durham—Portland Cement, Bricks, &c.	Urban District Council	Surveyor, Council Offices, Felling.
" 25	Winnington, Northwich—Caretaker's House at Sewage Outfall Works.	Urban and Rural District Councils	H. Bancroft & Sons, 88 Mosley Street, Manchester.
" 26	Glasgow—Warehouses, &c.	Corporation	Thomson & Sandilands, 241 West George Street, Glasgow.
" 26	Portskewett, Wales—Additions and Alterations to School.	School Board	Habershon, Fawkner & Groves, Queen's Chambers, High Street, Newport.
" 26	Swansea—Infirmary, &c., at Workhouse	Guardians	Ll. Jenkins, Clerk, Union Offices, Alaxandra Road, Swansea.
" 26	West Ham, E.—Thirty-six Double-tenement Workmen's Houses.	Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 26	Kendal—Additions to Netherfield Works	—	R. Walker, Architect, Windermere.
" 27	Mountain Ash—Alterations &c., to Police Station	Glamorgan County Council	T. M. Franklen, Clerk, County Council Offices, Westgate St., Cardiff.
" 27	Burton-on-Trent—Fireclay Retorts, Bricks, &c.	Gas and Electric Light Committee	F. L. Ramsden, Manager, Gas and Electric Light Works, Burton-on-Trent.
" 27	Dublin, Firebricks, Glass, &c.	Great Southern and Western Rly. (Ireland)	Company's Storekeeper General Stores, Inchicore, Dublin.
" 27	London, S.E.—Tiling Kitchen at Workhouse	Lambeth Guardians	W. Thurnall, Clerk, Brook Street, Kennington Road, S.E.
" 28	Sheffied—Stabling, &c., at Hospital	City Hospitals Committee	C. F. Wilke, City Surveyor, Town Hall, Sheffield.
" 28	Rathmines—Workmen's Dwellings	Urban District Council	F. Beckett & Metcalf, 10 Leinster Street, Rathmines.
" 28	Askam-in-Furness—Sunday Schools	Rev. W. Carr	Rev. W. Carr, Slater Terrace, Dalton-in-Furness.
" 28	Consett—Fourteen Cottages	Consett Iron Co., Ltd.	C. E. Oliver, Company's Architect, General Offices, Consett.
" 29	Gloss Links, near Bamburgh—Coastguard Buildings	Admiralty	Director, Works Dept., Admiralty, Northumberland Avenue, W.C.
" 29	Warrington—Cement Bricks &c	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
" 30	Halifax—Infants' School	School Board	C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.
" 30	Egremont, Cumberland—Schools	School Board	J. S. Moffatt, 53 Church Street, Whitehaven.
" 30	Ripponden, near Halifax—Liberal Club and Hall	—	W. C. Williams, 29 Southgate, Halifax.
" 30	Illogan, Cornwall—Girls' School	School Board	S. Hill, Architect. Green Lane, Redruth.
" 30	Windermere—Residence	J. Mudd	R. Walker, Architect, Windermere.
" 30	Hornsey, N.—Pulling Down & Clearing Site of Priory	—	J. Farrer, 2 Colman Street, E C.
Dec. 2	Belfast—Assembly Buildings	General Assembly of Presbyterian Church	W. H. Stephens & Son, Donegall Square Buildings, Belfast.
" 2	Cardiff—Additions to Warehouses	J. Isaac & Sons	E. G. C. Down, 31 High Street, Cardiff.
" 2	Farnborough, Hants—Residence and Stabling	—	W. E. Trevena, Ridgemount, Southampton Rd., Farnborough, Hants
" 2	Aylsham, Norfolk—Converting Dormitories into Sick Wards.	Board of Guardians	J. B. Pearce, 15 Upper King Street, Norwich.
" 2	Dungeness, Kent—Lighthouse, Fog-Signal House. &c	Corporation of Trinity House	E. G. Verity, 7 Great Marlborough Street W.
" 2	Church Hill, Brownhills—Alterations, &c., to Schools	Norton-under-Cannock U.D. Sch. Bd.	T. H. Fleeming, 102 Darlington Street, Wolverhampton.
" 3	Skerton, Lancaster—Infant School and Additions	Lancaster School Board	Wright & Son, Surveyors, Lancaster.
" 3	Leytonstone—Extending Buildings at Electric Lighting Works.	Urban District Council	W. Dawson, Borough Engineer, Town Hall, Leyton.
" 3	Dublin—Bricks, Tiles, Cement, &c.	Midland Great Western Rly. Co. (Ireland)	R. L. Badham, Secretary, Broadstone Station, Dublin.
" 3	Filton—Station Buildings	Great Western Railway Company	Engineer, Bristol Station.
" 3	Bromley—Addition to Asylum Laundry	Managers	J. & S. F. Clarkson, 136 High Street, Poplar, E.
" 4	Southampton—Alterations, &c., to Ordnance Survey Offices.	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
" 5	Warwick—Infirmary (151 Inmates and Staff)	Union Guardians	F. P. Trepass, 8 Jury Street, Warwick.
No date	Heddonsmouth, North Devon Alterations &c., to Inn	—	T. H. Watson & Son, 9 Nottingham Place, London, W.
	ENGINEERING:		
Nov. 21	Easingwold, Yorks—Covered Concrete Reservoir (120,000 gallons).	Rural District Council	Fairbank & Sons, 13 Lendal, York.
" 21	Liscard, Cheshire—Electric Wiring	Wallasey Urban District Council	J. H. Crowther, Electrical Engineer, Great Float, near Birkenhead.
" 21	Stafford—Mechanical Engineering to Pumping Machry	Waterworks Committee	W. Blackshaw, Borough Engineer, Borough Hall, Stafford.
" 21	London, E.C.—Locomotive Goods Engines and Tenders	Great Indian Peninsular Rly. Co.	J. L. Berry, Secretary, 48 Copthall Avenue, E C.
" 22	London, E.C.—Gas, Water and Steam Pipes and Fittings, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
" 22	London, E.C.—Open Goods Bogie Wagons	Bengal Nagpur Rly. Co., Ltd.	Secretary, 132 Gresham House, Old Broad Street, E.C
" 23	Swindon—Gasholder Tank	Gas Company	J. J. Jervis, Secretary. Gas Offices, Queen Street, Swindon.
" 23	Dundee—Tramways	Town Council	W Mackison, Engineer, City Chambers, Dundee.
" 25	Brighton—Electricity Meters	—	F. J. Tillstone, Town Clerk, Town Hall, Brighton
" 25	Sheffield—Ash and Coal Conveying Plant	Tramways Committee	A. L C. Fell, Gen. Manager, Tramways Dept, Town Hall, Sheffield.
" 25	King's Lynn—Tug	Conservancy Board	J. Pollock, Sons & Co., 22 Billiter Street, E.C.
" 25	Dublin—Electrical Supplies, &c.	United Tramways Company	R S. Tresilian, 9 Upper Sackville Street, Dublin
" 25	Liverpool—Overhead Electric. Equipment of Tramways	South Lancs. Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
" 25	Kettering—Extension of Sewers, &c.	Urban District Council	T. R. Smith, Surveyor, Market Place, Kettering.
" 26	London, N.—Electric Lamp Columns, Arc Lamps, &c.	Islington Borough Council	Borough Electrical Engineer, 50 Eden Grove. Holloway.
" 26	Aberdeen—Overhead Linework for Electric Tramways	Tramways Committee	J. A. Bell, City Electrical Engineer. Cotton Street, Aberdeen.
" 27	Coventry—Plant for Extension of Electricity Works	Electric Lighting Committee	J. A. Jeckell, Corporation Electricity Works, Coventry.
" 27	Lancaster—Tramcars	Corporation	W. A. Tester, Borough Electrical Engineer, Lancaster.
" 27	Paull-on-Humber—500 Gallons of Fuel Oil	—	Assistant Adjutant-General (B), North-Eastern District, York.
" 28	East Barnet—Bridge	Urban District Council	H. York, Surveyor, Station Road, New Barnet.
" 28	Nelson, Lancs—Reservoir (160 million Gallons)	Corporation	J. Newton, Son & Bayley, 17 Cooper Street, Manchester.
" 28	St. Ninian's, Stirlingshire—Reservoir	—	Crouch & Hogg, 53 Bothwell Street, Glasgow.
" 28	London, E.C.—Two Bogie Wagons and nine Carriages	Nizam's Guaranteed State Rlys. Co., Ltd.	Secretary, 50 Old Broad Street, E.C.
" 28	Hull—Six Rotary Transformers	Electric Lighting Committee	T. G. Milner. Town Hall, Hull.
" 30	Clitheroe, Lancs—Sewage Settling Tanks, &c.	Corporation	A. R. Bleavard, Borough Surveyor, Church Street. Clitheroe.
Dec. 2	Tripcock Point, Plumstead, Kent—Steel Light-house	Corporation of Trinity House	C. A. Kent, Secretary, Trinity House, London, E.C.
No date.	Durban. South Africa—Pier	Concessionaire	R. St. George Moore, 17 Victoria Street, S.W.
1902.			
Jan. 1	Lower Egypt—Lock Gates for Ziftah Barrage Works	Inspector-General of Irrigation	Inspector-General of Irrigation, Lower Egypt.
Feb. 28	Sydney. N.S.W.—Bridge	Government of N.S.W.	Under-Secretary for Public Works. Sydney.
Mar. 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
	IRON AND STEEL:		
Nov. 21	London, E.C.—Ironmongery, Gas & Water Fittings, &c.	London General Omnibus Co., Ltd.	Company's Coach Factory, 235 Upper Street, Islington, N.
" 21	Lancaster—Steel or Iron-framed Car Shed	Tramways Committee	Borough Surveyor, Town Hall, Lancaster.
" 22	London, E.C.—Galvanized Iron, Cast-iron Pipes, Stoves, Bolts, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL—*continued.*		
Nov. 23	Plymouth—300 tons Tramway Rails, Fishplates, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
„ 23	Newcastle-upon-Tyne—Nails, Chains, Castings, Bolts, Nuts, &c.	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-upon-Tyne.
„ 25	Sheffield—400 Steel-tyred Tramcar Wheels	Tramways Committee	A. L. C. Fell, Gen. Manager, Tramway Dept., Town Hall, Sheffield.
„ 25	Felling, Durham—Cast Ironwork, Shovels, &c.	Urban District Council	Surveyor, Council Offices, Felling.
„ 25	Amsterdam—Gas Mains and Pipes	Municipality	Stadsdrukkerij, Amsterdam.
„ 25	Dublin—Iron, Steel Castings, &c.	United Tramways Co.	R. S. Tresilian, 9 Upper Sackville Street, Dublin.
„ 26	London, N.—Electric Lamp Columns, &c.	Islington Borough Council	Borough Electrical Engineer, 50 Eden Grove, Holloway, N.
„ 26	Cockermouth—90 yards of Iron Rails	Urban District Council	Surveyor to Council, Cockermouth.
„ 27	Lancaster—Tramway Materials	Corporation	W. A. Tester, Borough Electrical Engineer, Lancaster.
„ 27	Dublin—Castings, Tools Iron Tubes and Fittings, &c.	Great Southern & Western Ry. (Ireland)	Company's Storekeeper, General Stores, Inchicore, Dublin.
„ 28	Glasgow—Cast-iron and Steelwork, &c., to Warehouses	Corporation	Thomson & Sandilands, 241 West George Street, Glasgow.
„ 28	Sheffield—Ironfounder's Work at Hospital	Corporation	C. F. Wike, City Surveyor, Town Hall Sheffield.
„ 29	Warrington—Nails, Screws, Bolts, Fishplates, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 30	Carlisle—870 lineal yds. of Fencing, Gates, &c., at Cattle Market.	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
„ 30	Swansea—Iron Castings, Ironmongery, &c.	Harbour Trustees	Engineer, Harbour Office, Swansea.
	PAINTING AND PLUMBING:		
Nov. 21	London, E.C.—Oils, Glass, &c.	London General Omnibus Co., Ltd.	Company's Coach Factory, 235 Upper Street, Islington, N.
„ 22	London, E.C.—Colours, Brushes, Lead, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus, E.C.
„ 23	Leeds—Painting Free Library	Corporation	W. Bakewell, 33 Park Square, Leeds.
„ 23	Shettlestone—Plumber Work at Hospital	Lightburn Joint Hospital Committee	A. Cullen, Architect, Brandon Chambers, Hamilton.
„ 23	Great Bentley, Essex—Painting, &c., at Weslyn. Chapel	—	C. E. Butcher, 3 Queen Street, Colchester.
„ 23	Newcastle-upon-Tyne—Copper and Lead Goods, Varnishes, Paints, Oils, &c.	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-upon-Tyne.
„ 25	Jarrow—Painting and Colouring at Schools	School Board	H. M. Adam, Higher Grade School, Jarrow.
„ 25	Harrogate—Colouring, Painting, at Convalescent Home	—	B. Shaw, Secretary, Royal Bath Hospital, &c., Harrogate.
„ 25	Canterbury—Painting Buildings on Sewage Farm	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, High St., Canterbury.
„ 25	Canterbury—External Painting	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, High St., Canterbury.
„ 25	Dublin—Paints, Brushes, &c.	United Tramways Co.	R. S. Tresilian, 9 Upper Sackville Street Dublin
„ 27	Dublin—Brushes, Colours, &c.	Great Southern & Western Ry. (Ireland)	Company's Storekeeper, General Stores, Inchicore, Dublin.
„ 28	Rathmines—Plumbing to Workmen's Dwellings, &c.	Urban District Council	Beckett & Metcalf, 10 Leinster Street, Rathmines.
„ 28	Sheffield—Plumber, Painter and Glazier Work at Hospital.	City Hospitals Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 28	Glasgow—Plumber & Painter Work and Gas Fittings at Warehouses, &c.	Corporation	Thomson & Sandilands, 241 West George Street, Glasgow.
„ 29	Warrington—White Lead, Oils, Lead Piping & Sheet, Brushes, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 30	Swansea—Oils, &c.	Harbour Trustees	Engineer, Harbour Office, Swansea.
	ROADS AND CARTAGE:		
Nov. 21	Reading—Street Improvement Works	Sanitary Authority	J. Bowen, Borough Surveyor, Town Hall, Reading.
„ 22	Newmarket—Fifty Tons of Chip Granite	Urban District Council	S. J. Ennion, Clerk, Deva Chambers, Newmarket
„ 23	Cwmaman—Roads, &c	Cottage Co., Ltd.	J. Ll. Smith & Davies, Architects, Aberdare.
„ 24	Middlesbrough—Street Repairs, &c.	Streets Committee	Borough Engineer, Municipal Buildings, Middlesbrough.
„ 25	Dublin—Harness Materials	Dublin United Tramways Co.	Secretary, 9 Upper Sackville Street, Dublin.
„ 25	Surbiton—Street Works	Urban District Council	Surveyor, Council Offices, Ewell Road, Surbiton.
„ 25	Felling, Durham—Macadam, Brooms, Setts, Curb, &c.	Urban District Council	Surveyor, Council Offices, Felling.
„ 26	Isleworth—200 Tons Guernsey Granite Spalls	Brentford Union Guardians	W. Stephens, Clerk, Union Offices, Isleworth.
„ 26	Walthamstow—Street Works	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
„ 26	Kensal Green, N.W.—Roadmaking and Paving Works	Willesden District Council	O. C. Robson, Council's Engnr., Public Offices, Dyne Rd., Kilburn.
„ 27	London, S.W.—Making-up and Paving Road	Fulham Borough Council	C. Botterill, Borough Surveyor, Town Hall, Fulham, S.W.
„ 27	Barnet—Making-up Roads	Urban District Council	W. H. Mansbridge, 40 High Street, Barnet,
„ 28	Rathmines—Roads, Footpaths, &c.	Urban District Council	Beckett & Medcalf, 10 Leinster Street, Rathmines.
„ 29	Heswell, Cheshire—Road	Wirral Rural District Council	W. H. Churton, Clerk, Eastgate Buildings, Chester
No date	Loughborough—Extension and Widening of Streets	Corporation	A. W. Walker, Borough Surveyor, Town Hall, Loughborough.
	SANITARY;		
Nov. 22	London, E.C.—Drain Pipes, &c.	Great Eastern Railway	Secretary, Liverpool Street Terminus. E.C.
„ 23	Harrow-on-the-Hill—Sewerage Works	Urban District Council	J. P. Bennetts, Surveyor to Council, Harrow-on-the-Hill.
„ 23	Cwmaman—Sewers and Surface Water Drains	Cottage Co., Ltd.	J. Ll. Smith & Davies, Architects, Aberdare.
„ 25	Kettering—Sewers, &c.	Urban District Council	T. R. Smith Surveyor, Market Place, Kettering.
„ 25	Felling, Durham—Scavenging Broom, Pipes &c.	Urban District Council	Surveyor, Council Offices, Felling.
„ 25	Stapleford—Scavenging, Removal of Refuse, &c.	Rural District Council	F. W. Fox, Clerk, South Parade Chambers, Nottingham.
„ 25	Heworth, Durham, Brushes, Brooms, &c	School Board	G. Bolam, Clerk, Board Office, Felling.
„ 25	Leeds—Brooms for Scavenging	Markets Committee	Superintendent at Market, Leeds.
„ 27	Dublin—Sewer Pipes, &c.	Gt. Southern & Western Rly (Ireland)	Company's Storekeeper, General Stores, Inchicore, Dublin.
„ 27	Ardenshaw, Lancs Removal of Nightsoil, Refuse, &c.	Urban District Council	F. Hamer, Clerk, 2 Guide Lane, Ardenshaw.
„ 27	Glasgow—Intercepting Sewer	Corporation	City Engineer, 64 Cochrane Street Glasgow.
„ 28	Rathmines—Sewers, Sanitary, Plumbing, &c.	Urban District Council	Beckett & Medcalf, 10 Leinster Street, Rathmines.
„ 29	Warrington—Drain Pipes, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 30	Clitheroe, Lancs—Two Setting Tanks on Sewage Farm	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.
„ 30	Holmfirth, Yorks—Sewerage and Sewage Disposal Works.	Urban District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster, S.W.
„ 30	Williton, Somerset—Drainage System, &c., at Workhouse.	Guardians	T. H. Andrew, Surveyor, Williton.
	TIMBER:		
Nov. 23	Newcastle-upon-Tyne—Timber	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-upon-Tyne.
„ 29	Warrington—Creosoted Sleepers and Crossing Timbers, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 30	Swansea—Timber	Harbour Trustees	Engineer, Harbour Office, Swansea.
Dec. 3	Dublin—Timber	Midland Gt. Western Railway Co. (Ireland)	R. L. Badham, Secretary, Broadstone Station, Dublin.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov. 22	Barnsley—Guardians' Offices	£20.	C. J. Tyas, 17 Regent Street, Barnsley.
„ 23	Bexhill—Laying-out Ornamental Grounds	£20.	E. S. Douglas, Town Hall, Bexhill.
„ 23	Bexhill—Isolation Hospital	£25.	E. S. Douglas, Town Hall, Bexhill.
Dec. 17	Tywardreath—Board Schools	—	J. Cook, Clerk to School Board, Tywardreath, Par Station, Cornwall
„ 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902. Jan. 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	—	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 15	Kirkcaldy—Elementary School (400 pupils)	—	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No Date.	Ilkley—New Church and Schools	—	Rev. W. Jones, Hope House, Hebden Bridge.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRIGHTON.—For the erection of a bakery, dry goods store, and stabling (first portion), for the Brighton Equitable Co-operative Society, Ltd. Mr. W. C. F. Gillam, M.S.A., architect, Brighton :—

The General Builders, Ltd., London	£1,759 0 0
W. A. Field & Co.	1,687 0 0
H. J. Penfold	1,597 0 0
J. Barnes	1 578 0 0
Saunders Bros.	1,564 2 10
Patching & Son	1,563 14 7
Brown & Sons*	1,444 0 0

[Rest of Brighton.]

Steel Construction.

Aston & Son, London	£225 0 0
Potter & Co.	217 2 3
Every, Lewes*	201 18 6

* Provisionally accepted.

BARLBY (YORKS).—For the construction of new sewers and sewage disposal works for the drainage of Barlby, for the Riccall Rural District Council. Mr. E. J. Silcock, M.I.C.E., engineer, 10, Park Row, Leeds :—

J. Brunton, Hull	£4,760 15 4
Woodall & Woodall, Selby	4,187 10 0
Schofield, Sons, & Co., Ltd., Leeds	3,790 0 0
T. C. Starkey, Hull	3,680 3 6
T. Egan & Sons, Bradford	3,615 4 10
H. Arnold & Son,* Doncaster	3,170 0 0
B. Roberts, Beckett Road, Doncaster	2,838 10 11

* Accepted.

CHELTENHAM.—For the erection of proposed town hall :—

King & Sons, Gloucester	£36,489
Pollard, Bridgwater	34,871
Morris & Son, Ascot	34,213
Gibbs, King's Heath	33,200
W. Jones, Gloucester	33,110
Patrick, Jun., London	32,813
Bloxham, Banbury	32,809
Hughes, Birmingham	31,510
Brood, Malvern	31,432
Hodson, Nottingham	31,418
Parnell & Son, Rugby	31,220
Maple & Co., London	30,992
Estcourt, Gloucester	30,905
Wilcocks & Co., Wolverhampton	30,795
Warburton, Manchester	29,950
Bevan, Bristol	29,820
Collins & Godfrey, Tewkesbury	29,310
Bowers, Hereford	28,795
Williamson & Co., Nottingham	28,379

CROYDON.—For making up the following streets in the hamlet of Wallington—viz., Onslow Gardens and Springfield Road—for the Croydon Rural District Council. Mr. R. M. Chart, F.S.I., surveyor :—

Onslow Gardens.

T. Adams, Wood Green	£2,193
Practical Landscape Gardening Company, 25 Victoria Street, London	2,985
W. H. Wheeler, Blackfriars, London	2,567
Free & Son, Maidenhead	2,510
W. Langridge, Croydon	2,484
C. Iles,* Mitcham	2,471
Lawrence & Thacker	2,400

Springfield Road.

T. Adams	£498
Practical Landscape Gardening Company	450
Free & Sons	400
E. J. Burnand, Wallington	385
W. Langridge	371
W. H. Wheeler	352
C. Iles,*	318
Lawrence & Thacker	308

* Accepted.

DEVONPORT.—For alterations to and re-building part of the "King's Arms," George Street, for Mr. J. Martyn. Mr. Edgar M. Leest, architect, 14 St. Aubyn Street, Devonport :—

	Cement Front.	Glazed Terra Cotta Front.
T. Jenkin & Son	£1,433 0 0	£1,787 10 0
A. N. Coles	1,377 0 0	1,671 0 0
J. Quick	1,205 0 0	1,651 0 0
J. Coles	1,313 0 0	1,627 0 0
W. G. Goad	1,284 10 0	1,615 15 0
T. May (Plymouth)	1,288 0 0	1,615 0 0*
J. Full	1,277 13 1	1,593 18 0
F. Jillard	1,224 18 8	1,567 4 9

* Accepted.

DELAMERE (CHESHIRE).—For foundations and basements of main building and nurses' home at the Consumption Sanatorium, for Mr. W. J. Crossley, J.P. Mr. W. Cecil Hardisty, architect, Manchester. Quantities by Mr. Charles Jackson, Manchester :—

Freeman & Co.	£6,145
Normanton & Son	5,496
Hamilton & Son	5,247
W. Healey	5,010
P. Hodkinson	4,898
Parker Bros.	4,853
Wilson & Toft	4,720
Neill & Sons	£4,660
J. B. Bury	4,645
Brown & Son	4,248
Beckett & Co.	3,862
Bullivant & Sons	3,791
Gerrard & Sons*	3,620

* Accepted.

DUNFERMLINE.—For laying causeway in several streets within the burgh. Mr. Andrew W. Bell, C.E., burgh engineer :—

Whinstone.

United Granite Quarries, Ltd., Atlantic Chambers, 45 Hope Street, Glasgow	£5,219 17 9
W. Carracher, Appin Crescent, Dunfermline	4,161 10 0
J. & J. Neilson, Muirhead Church Gates, Glasgow	4,147 13 9
J. Leith, jun., 321 Clifton Road, Wood Side, Aberdeen	4,009 2 7
J. Swenny, Falkirk	3,993 17 8
J. Martin, Queen Anne Street, Dunfermline	3,979 3 8
J. Lester, Appin Crescent, Dunfermline	3,972 6 8
Young & Co., West Street, Mineral Street, Glasgow	3,550 10 3
W. R. Gall, Thistle Street, Stirling	3,531 4 3
W. Wilson & Co.,* 34 West George Street, Glasgow	3,434 10 8

Granite.

J. Lester	£6,671 5 5
United Granite Quarries, Ltd.	5,856 1 3
J. Martin	5,767 18 9
J. & J. Neilson	5,706 1 6
W. Carracher	5,420 10 0
Young & Co.	5,211 4 10
J. McAdam & Son, 47 & 49 Charlotte Street, Aberdeen	5,124 9 6
W. Wilson & Co.	4,918 12 1
J. Leith, jun.	4,897 13 6

* Accepted.

FULBOURN (near CAMBRIDGE).—For the erection of an additional wing on the female side to accommodate about 88 patients and their eight attendants, at the Cambridgeshire, &c., Asylum, Fulbourn, near Cambridge. Mr. A. P. MacAlister, architect, 20 St. Andrew's Street, Cambridge :—

C. Roper, Ipswich	£19,252 0 0
J. Jackson, Sutton	17,100 0 0
A. Guy, Leytonstone	16,996 10 6
J. Shillitoe & Son, Bury St. Edmunds	16,691 0 0
Coulson & Lofts, Cambridge	16,640 0 0
J. & J. Bloxham, Banbury, Oxon	16,569 0 0
W. Howard, Huntingdon	16,140 0 0
H. F. Martin, Northampton	15,951 0 0
Oak Building Co., Cambridge	15,495 16 0
F. C. Thurman, Walton Works, Ipswich	15,459 0 0
W. Bell & Sons, Castle Street, Cambridge	15,428 0 0
Kettering Co-operative Builders Co., Kettering	15,036 0 0
E. Willmott & Sons,* Cambridge	14,953 0 0
F. H. Coleman, Bedford	14,944 0 0
J. Cracknell, Peterborough	14,838 0 0
F. B, Thackray & Co., Huntingdon	14,795 0 0

* Provisionally accepted. [Architect's estimate, £14,560.]

GOSPORT.—For the following works, for the Urban District Council: 24 miles of sewers, varying from 3ft. to 6in. diameter; 157 manholes; 13 ejector chambers; septic tanks, valve chamber, buildings, and machinery; 3½ miles of cast-iron rising main, varying from 15in. to 5in. diameter; 7 miles of cast-iron air-mains, varying from 12in. to 2in. diameter. Mr. R. St. George-Moore, M.I.C.E., engineer, 17 Victoria Street, Westminster, S.W. Mr. H. Frost, resident engineer :—

Hughes & Lancaster, London	£98,966
Underwood Bros,, London	97,448
Wilkinson Bros., Finsbury Park	97,019
B. Cooke & Co., Westminster	96,850
J. Jackson, Walton-on-Thames	96,577
Patrick & Co., Gosport	94,778
Grisenthwaite & Watson, Carlisle	92,400
H. Weldon, Birmingham	89,052
J. & S. Binns, London	88,212
G. Osenton,* Westerham, Kent	86,280
Jones & Son, Neath	76,740

* Accepted.

LARNE (IRELAND).—For the erection and completion of mortuary chapels, caretaker's house, boundary walls, pillars, gates, and railings, and for drainage, forming walks and grave spaces, together with the works incidental thereto, in the laying-out of the new cemetery at Ballycraigy, for the Larne Urban District Council :—

H. Girvan, Station Road, Larne	£3,489 16
R. Colwell, Old Park Road, Belfast	3,400 0
Higgarty & Gault, Larne	3,231 11
W. McNeill,* Victoria Street, Larne	2,414 12

* Accepted.

LIMERICK.—For the supply of electric plant required for the Corporation electric-lighting scheme :—

Handley & Shanks	£19,265 13 5
Johnson & Phillips	19,153 19 10
W. Coates & Sons, Ltd.	17,597 17 8
Porte, Sykes, & Co.	17,540 19 6
British Schuckert Electrical Co., Ltd.	17,203 19 0
Crompton & Co., Ltd.	16,678 10 0
F. Suter & Co.	16,513 6 4
Allgemeine Electricitäts Gesellschaft	16,381 0 0
P. Dillon, Thomondgate	16,289 0 0

Note.—The tenders have been referred to Mr. Enright.

LONDON, S.E.—For alterations and additions to laundry premises in rear of 16 and 18 Queen's Road Peckham, for Mr. C. D. Cocks. Mr. A. E. Mullins, architect, 16 Church Street, Camberwell Green, S.E. :—

Burman & Sons	£1,205
Balaam Bros.	1,190
G. Parker	1,025

LONDON, S.E.—For the erection of a receiving house and cottages for children on the Newlands, Peckham Rye, S.E., for the Guardians of St. Giles, Camberwell. Mr. A. E. Mullins, architect, 16 Church Street, Camberwell Green, S.E. :—

Foster Bros.	£14,882 0 0
Holliday & Greenwood	13,765 0 0
G. Parker	13,480 0 0
W. Reason	13,463 0 0
Burman & Sons	13,200 0 0
Parnell & Co.	13,059 0 0
T. G. Sharpington	12,998 0 0
J. R. Tomkins	12,836 11 7
Gibb & Co.	12,709 0 0
Courtenay & Fairbain	12,599 0 0
C. Ansell	12,500 0 0
H. L. Holloway	12,442 0 0
W. Vogel Goad	12,385 0 0
Balaam Bros.	12,112 0 0

LONDON, N.—For alterations at the "Shaftesbury Arms," Hoxton, N. Messrs. C. Foulsham & Herbert Riches, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E., architects. Quantities supplied :—

F. & T. Thorn	£2,583
Todd & Newman	2,543
A. Rowe	2,488
Courtney & Fairbairn*	2,375
Sheffield Bros.†	2,245

* Accepted. † Withdrawn.

LONDON, S.W.—For the erection of a pair of semi detached houses at Streatham. Messrs. Bell, Withers & Meredith, architects, 3 Salters Hall Court, London :—

D. Waller	£2,457
Spencer-Santo, Ltd.	2,350
Gathercole Bros.	2,000
W. H. Larman,* Wimbledon	1,600

* Accepted.

LONDON.—Accepted for alterations and repairs at "The Old Commodore," Whitechapel, E. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E.C. :—

S. Osborn & Sons	£766

LONDON.—For alterations at "The Shaftesbury Arms," Hoxton, N. Messrs. C. Foulsham and Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E. Quantities supplied :—

F. & T. Thorne	£2,588
Todd & Newman	2,543
A. Rowe	2,488
Courtney & Fairbairn*	2,375
Sheffield Bros.†	2,245

* Accepted. † Withdrawn—error.

LONDON.—For alterations at "The Barley Mow," Limehouse, E. Messrs. C. Foulsham and Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C. and Bromley-by-Bow, E. :—

E. F. & T. J. Walker	£825
C. North	789
W. Harper	680
S. Scott*	677

* Accepted.

PRIMLEY (PAIGNTON).—For alterations and additions, for Mr. Henry Conway Belfield. Messrs. Bridgman & Bridgman, A.R.I.B.A., M.S.A., architects :—

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G. Webber	2,662 0
E. Westlake	2,651 0
C. & R. E. Drew	2,648 0
W. Lethbridge	2,639 0
H. Webber & Sons	2,615 0
Dart & Pollard*	2,202 0

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C. & R. E. Drew	188 10
Thomas & Sons	184 0

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C. Bootyman	209 0

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REIGATE.—For the construction of a new road, 40 feet wide and 350 yards in length, in the Castle Field, Reigate, commencing at the public footpath leading off Church Street and opening in Tunnel Road, for the Corporation. Mr. Fred. T. Clayton, borough surveyor :—

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W. Hickinbottom,* Redhill	2,365 5 0

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ST. ALBANS, HERTS.—For the erection of a cottage residence, Blenheim Road, St. Albans, Herts. Mr. S. Doddemeade Edmunds architect, St. Albans and London :—

E. Dunham	£809 0
Vail & Co.	648 0
W. Sparrow	589 10
W. Sharp	564 0
Goodchild & Sons	560 0

[All of St. Albans.]

UPTON PARK.—For the erection of two blocks of buildings on a site at Carter Road, Plaistow, E., comprising pupil teachers' laundry, and cookery centres, and caretaker's house, for the West Ham School Board. Mr. William Jacques, architect to the Board, 2 Fen Court, E.C. Quantities by Messrs. R. L. Curtis & Sons :—

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Nightingale, B. E.	24,901
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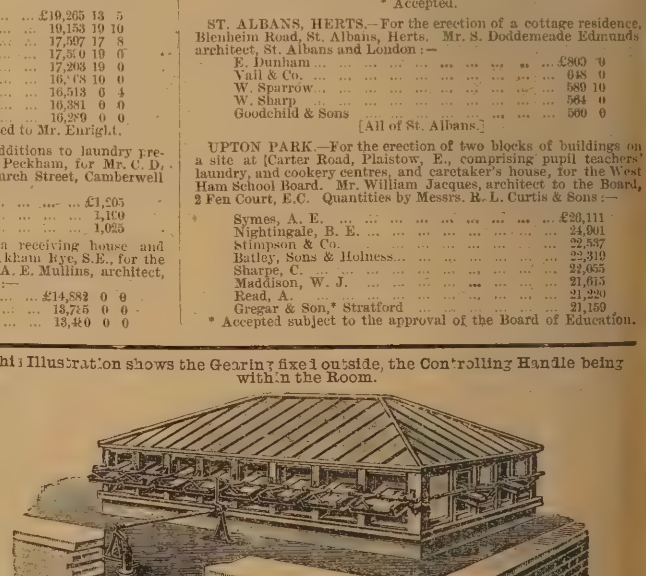

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Four sectional catalogues have just been issued by Messrs. Robert Boyle & Son, Ltd., of 64, Holborn Viaduct, E.C. Three of them deal with the system of natural ventilation as applied to churches, schools, hospitals and asylums, while the fourth is descriptive of the patent "air-pump" ventilators and other ventilating appliances. Apart from their being trade catalogues, they will be found of considerable utility to architects, as they contain much information on the subject of natural ventilation and are illustrated by a number of diagrams. In regard to the ventilation of churches, which is so important a matter, it is pointed out that the vitiated air should be extracted at the highest part of the building, where it ascends naturally, and the fresh air admitted at or below the breathing level, in an upward direction and at a low velocity, through brackets or tubes distributed around the walls. The system has been applied to numerous churches throughout the country—such as St. John's, Leonard's-on-Sea, and St. Mary's Redcliffe, Bristol (both under the direction of the late Sir Arthur Blomfield). With regard to hospitals, in view of the present outbreak of small-pox in London it is interesting to note that the hospital ship "Castalia" is ventilated on Boyle's system, which, after careful inquiry, was selected as the best and most suitable for the purpose. The system is so well-known and so widely adopted that there is no need now to dilate on its merits. It is sufficient, in noticing these new catalogues, to say that experience has proved the system of natural ventilation to be thoroughly effective.

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LIVERPOOL CATHEDRAL:
A Protest and Petition.

ARCHITECTS and other Artists have taken a decided exception to the scheme for obtaining Designs for the above Cathedral. The Editorial Committee of The Architectural Review has devoted a considerable portion of the November Issue to a Protest and Petition against the Conditions of the Competition.

The Protest takes the form of expressions of opinion from the following:

EDWIN A. ABBEY, R.A.,
SIR L. ALMA-TADEMA, R.A.,
JOHN BELCHER, A.R.A.,
REGINALD BLOMFIELD, M.A.,
WALTER CRANE,
SIR THOMAS DREW, R.H.A.,
HEN. HARTLEY, F.R.I.B.A.,
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Professor BERESFORD PITE, F.R.I.B.A.,
W. H. SETH-SMITH, F.R.I.B.A., Pres. A.A.,
HAMO THORNYCROFT, R.A.,
ASTON WEBB, A.R.A.,
G. F. BODLEY, A.R.A.,

AND MANY OTHERS.

The questions of SITE and STYLE were fully dealt with by Professor SIMPSON and Mr. E. S. PRIOR in the OCTOBER Issue of The Architectural Review.

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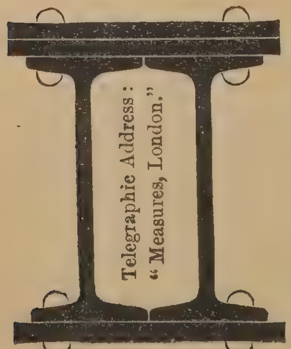
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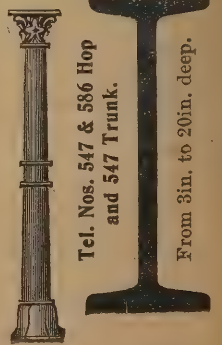
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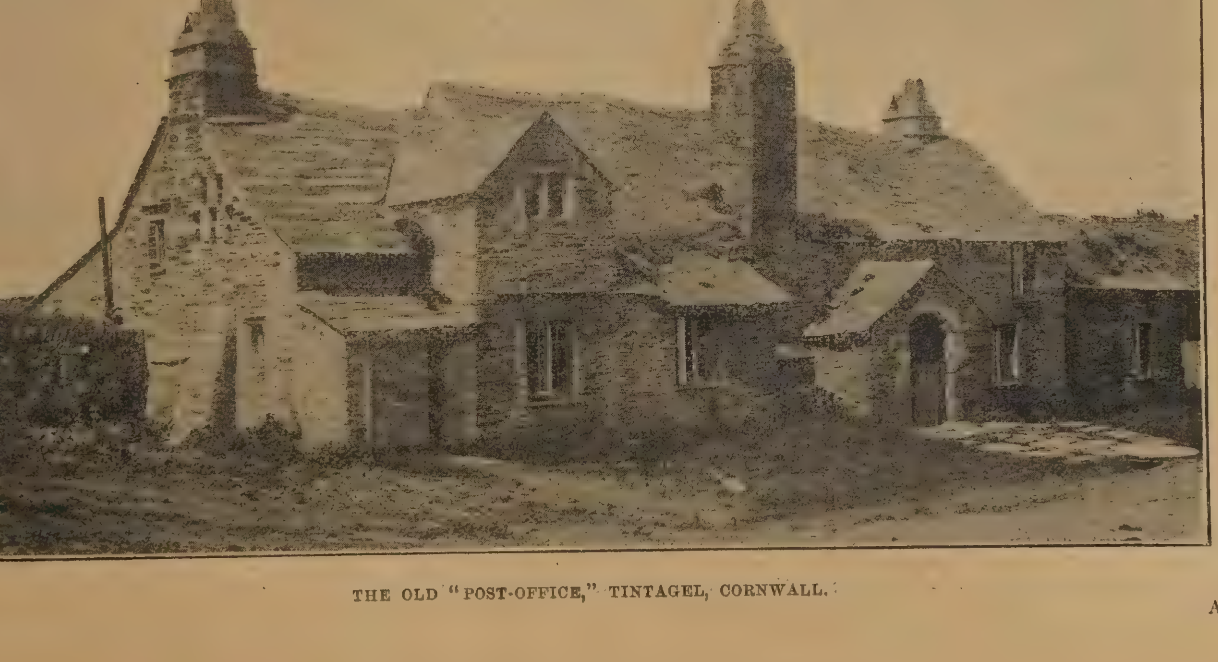
Bricklaying. THE facts about the modern bricklayer which have been so excellently set forth by the "Times," though familiar to the majority of architects and builders, are so collected and summarised that the inferences to be drawn from them must demand the attention of everyone connected with the building trade. The question—How many bricks should be laid in a day?—has been periodically raised for many years, but perhaps the most succinct answer to it is that given by "An Honest Bricklayer" in our issue for August 15th, 1900: "It all depends on who is watching him!" Mr. Thomas Blashill dealt with the matter in the paper on "The Present Condition of the Building Industry" which he read before the Surveyors' Institution last March, when he pointed out that the desire to have an easy time was common among time-workers of every class, but that a more serious matter than mere idleness was the deliberate loitering which masters complain of. The "Times," however, in addition to proving that the unwritten law of bricklayers is to lay not more than 400 bricks a day (which is less than half the number formerly laid), goes on to show that the plasterers, masons, and other building operatives, are similarly negligent; and for this general laxity trade-unionism is held mainly responsible. The facts which bear out this contention can be read in another column. However, master-builders have long had to face these difficulties, and it is the remedy rather than the statement of the case which now demands attention. At the present time, with a standard rate of wages, a good bricklayer is paid just the same as a bad bricklayer; and, moreover, the chances are that if the master-builder discharges the latter the trade-union will take up the cudgels and perhaps a strike will result. Now, it is evident to anyone who considers the matter logically, and with an unbiased mind, that it is for the benefit of all concerned that the relations between employer and employed should be more amicable than they are at present, for strikes spell nothing but disaster to one party or the other, or to both. We would suggest that, with this object in view, the masters' associations and the trade-unions, instead of equipping themselves like combatants ready to fight on the slightest provocation, should approach each other and consider the feasibility of forming joint boards in every district, so that when a bricklayer proposed himself as a member of the trade-union this board would test his qualifications—say, by requiring him to set out and rub an arch, and to bond difficult work. In this way only competent bricklayers would be admitted into the union, and the trouble caused by incompetent labourers usurping the place of the bricklayer, and receiving the same wages, would be avoided. Boards on the same principle have been constituted for the registration of plumbers in this country, and their usefulness is proved. The masters should not recognize incompetent men as trade-unionists, and should refuse to pay them union rates of wages. It is not to be expected that such an arrangement as we have suggested (which is simply that of the old craft guilds) would be a panacea for all the evils, but it would be a move in the right direction, and improvements might follow. It may be contended that, even under these conditions, the thoroughly competent and hard-working bricklayer would be no better off than the lazy bricklayer who was only moderately competent; but this argument can be refuted on the ground that, while the former would be certain in his employment, the latter's incompetency would assure his discharge at the earliest opportunity. Matters can only be made worse if masters and men insist on maintaining an attitude of belligerents, and it is much to be regretted they should not generally see that it is to their mutual welfare to be on better terms, even though some masters be brutes and some workmen ignorant blockheads.

Tintagel Post-Office. IN the village of Trevena, better known as Tintagel, in Cornwall, stands a curious little cottage whose deep-set porches and irregularly-sloping roof of heavy slabs of slate have long been the delight of artists. Locally known as the "Old Post-Office" (having at one time served that purpose), its plan is that of a fourteenth-century house—small indeed, but sufficiently commodious—its low construction and massive walls protecting the inmates from the fury of the Atlantic gales. Entering through one of the heavy doors which shelter behind the porches the visitor finds himself in a passage communicating with a large sitting-room open to the roof, having a huge stone fireplace and cosy window seats in snug recesses. A low-roofed kitchen and caretaker's room adjoin the sitting-room, over which hangs a gallery, probably once used to sleep in. Three bedrooms, curiously placed, complete the accommodation, and over all stretch the great roof timbers, black with the smoke of ages. In 1895 the building was put up for sale by auction, and it was feared that it might be bought with the object of clearing the ground and rebuilding. It was then that Miss Johns purchased it with a view to its preservation, and a number of artists by the sale of their works made a handsome contribution towards the cost of putting it into repair, which work of repair was entrusted to the Society for the Protection of Ancient Buildings. The National Trust has now the opportunity of becoming the owner of this interesting specimen of fourteenth-century architecture, the terms being that they pay £200 down and grant Miss Johns a lease of the building for her life-time at a nominal rent. They appeal for help to raise the necessary £200, of which about £150 is still required. Donations should be sent to the secretary of the National Trust, 1, Great College Street, S.W., by whose courtesy we are enabled to publish the accompanying illustration



THE OLD "POST-OFFICE," TINTAGEL, CORNWALL.

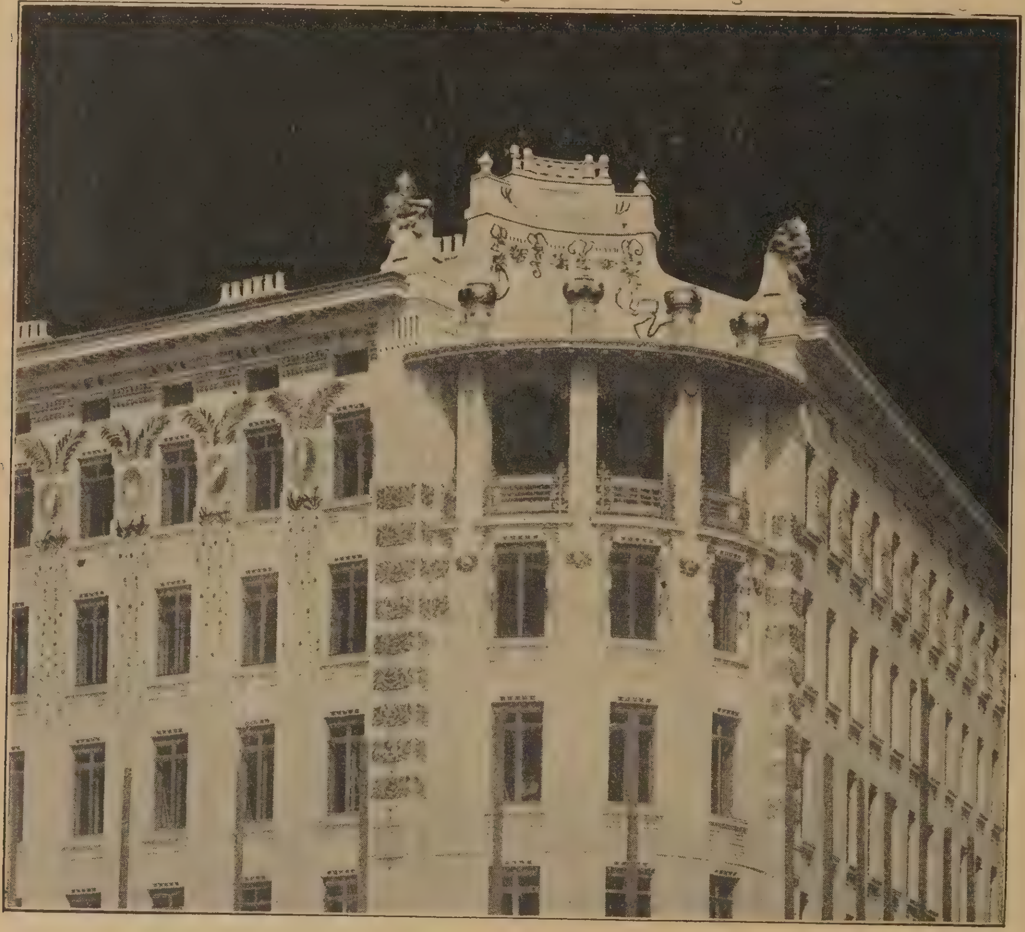
MEN WHO BUILD.

No. 67.—OTTO WAGNER and T. M. OLBRICH (of Vienna).

By ALFRED W. FRED.

IN the second half of the last century forces gathered from a thousand sources, pure and impure, out of which arose the revival of art in Vienna. After a colourless and spiritless epoch (broken only in the domain of painting during the short though powerful ascendancy of Hans Makart) had lasted almost a century since the time of the Congress, such an expansive force developed in the veins of both artists and public that, upon the rising of a young artistic feeling and the revolution of the creative faculty, the transformation of the public followed with a speed and power till then unknown. Culture and art in the individual had been discouraged for so long that when at last the cry for the new art became evident in Vienna it was soon found that the first prophet was also the best. Of course, even here there had been pioneers of this new modern art. What happens in the history of every development may be observed here: that decades before the time when the great turn in the direction and art of conception occurs, Nature inspires whole-hearted artists, who at the period in which they live—about a generation in advance of their time, despised by their comrades—give expression to all the desires which became a fighting programme for their successors, and later still a dogma. Vienna can show in the world of art such men ahead of their time. In the front rank of all stands Otto Wagner, the greatest modern European architect I know of. In painting, perhaps, Th. v. Hormann should be named, for a time a "plein-air" painter when the school of Barbizon was but little appreciated by the Germans; but certainly the South Tyrolean, G. Segantini, should be mentioned—famous to-day, though ten years ago an independent and ingenious art-pioneer of the "pointillists." These men were the lights of the new art in Austria. No doubt they had colleagues, only they are not all known, for many were unable to see the fulfilment. Death took some, and others were not robust enough of talent to ripen without the encouragement of their contemporaries. The succeeding generation, as already stated, united all the latent revolutionary vigour, all the earnestness, all the love of novelty, which also contains potent sources of art development; and at last, in the year 1896, the age of the new art opened in Vienna. The separation of a group of painters from the community of art, and their constitution into a fresh society, gave the name of "Secession" to the new movement. The word became a power. Society took it up, coarsening and depreciating its spirit. Certain elements of the new art were considered its soul; and all the confusion that indicates a hot "culture" struggle set in. These five last years of the nineteenth century were the most important of the age in the development of Austrian art; architecture, as well as painting, began to get intimate with life. It is impossible to imagine such an inartistic civilization as to essentials as that of Austria from the year 1870 to the year 1895. Many latent desires existed which found no fulfilment; narrow, separate and exclusive circles exercised an old-fashioned interest in the collecting of antiquities; painting was academical, dark, lifeless—more science than art; and in architecture, which in all ages is the clearest indicator of the level of civilization, there was seen the artistic incohesiveness of the time in the tendency to adopt all historical styles.

As the first Electrical Exhibition illustrated the civilization of the century, and the Paris Exhibition of 1899 produced the Eiffel Tower as a monumental example of architecture in ironwork, so the new Burg Theatre was completed as the last of a whole series of Hellenising structures, such as the Parliament House and the University. Taste changed from one historical style to the other. The need for a living style remained unappreciated so long that no one realized that nothing new could result from copying the past and that "style" could only be the continued artistic force of its time.



CORNER OF APARTMENT HOUSE, VIENNA. OTTO WAGNER, ARCHITECT.

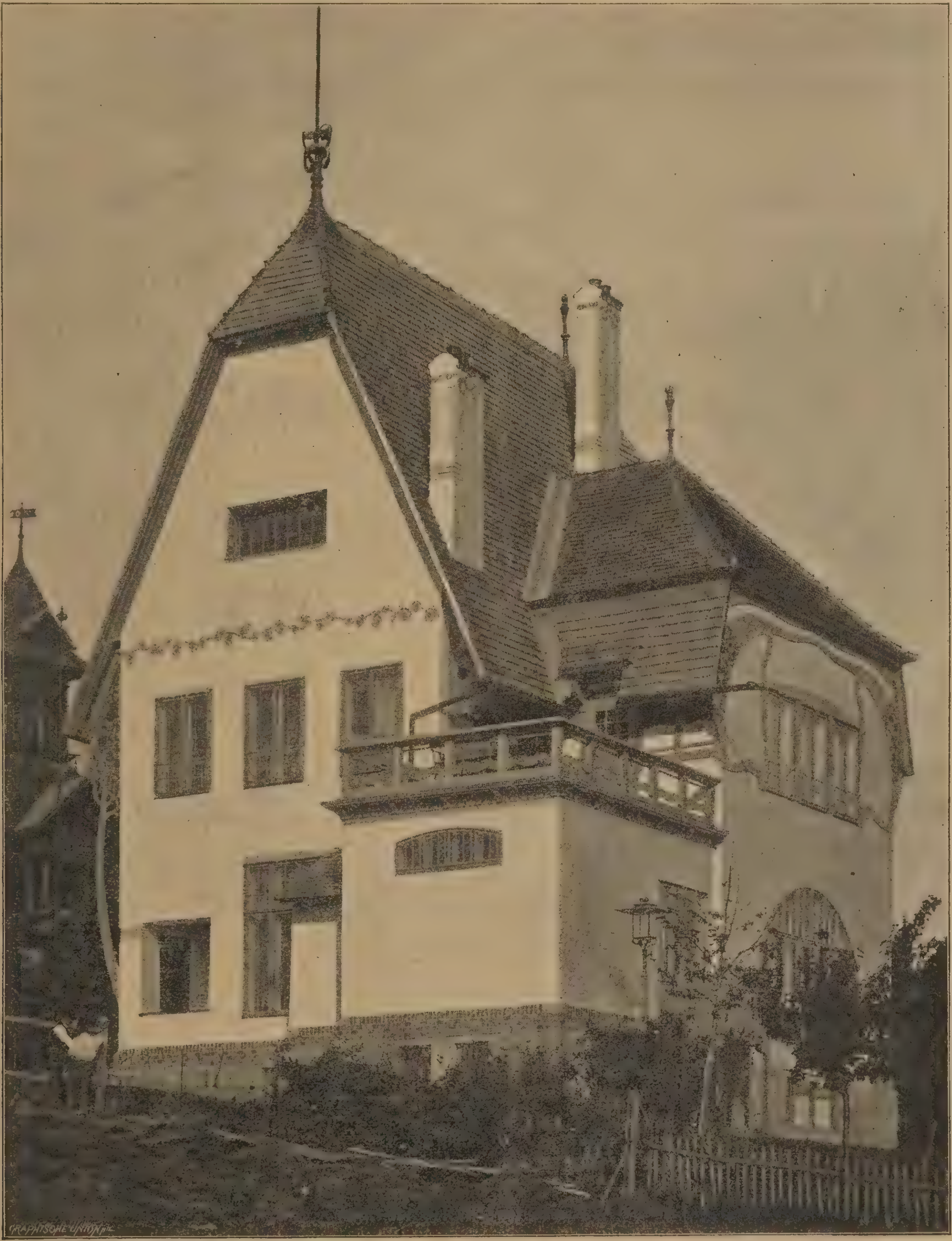
Otto Wagner, of Vienna, came to realise this, and he did not hesitate too much on his way. It can be said of nobody of the last generation that he acquired his style of art, architecture or painting wholly by independent uninfluenced thought or by his own experience. Otto Wagner received no assistance except from life itself, from work and experience, and from modern technique. His ideas have, of course, had their preparation in the lines of thought of all past times, but Wagner learnt nothing from his contemporaries. Thus he is one of the very first, not a forerunner but a leader—a finger-post. To-day, at sixty, he has scholars who are choosing their own way, but his own work is far from being finished. With every year and every new project his powers grow stronger, and it is a rare and wonderful sight to witness how the sexagenarian in the last decade of his life maintains the courage and the daring of his ideas. His book, "Moderne Architectur," published by A. Schroll, of Vienna, should be read by every architect. He believes that an architect attains the full power of his creative faculties only after he has reached his fortieth year—as one has so much to learn up till then, not so much from the works of others as from personal experience. Wagner adopts this view from his own life. He was educated in the Berlin and Vienna academies. Siccardsburg was really the Austrian master to whom he was indebted for his strongest impressions as a student. But it can only be said of the works he did between his twenty-fifth and his fortieth year, that they were the means to an art development; they were stages on the way. This master, whose name may easily rank with those of Fischer von Erlach, Von der Null, Siccardsburg and Godfried Semper, matured slowly; in fact, he lived at a time when rapid development was in no way favoured. To-day a man may be already famous at twenty; he may clearly assert his personality in his works by then. But it was not so in the 'sixties and 'seventies, and, as Wagner himself has said, architecture is not an art that offers many possibilities to youth. It is the art of matured manhood.

It is self-evident that no architect in his first work shows completely that art which, in his riper years, sets forth his greatness. But it is also evident that every great artist betrays in his earlier works what his subsequent style will be. Every observer of Wagner's early works must see that the peculiar power of the master lies in the bold features of his conception. The plan means everything; for external detail he has never had anything to spare. Organisation and harmony in the ground plan and facade are the features of the Wagner buildings.

Much will be said in what follows about the views of the master, for his personality has influenced art and artistic pursuits in Vienna in quite an unprecedented way, and his existence closes one period of modern artistic style.

The Wagner buildings of the end of the year 1870 to the year 1880 betray the influence of Fischer von Erlach and Godfried Semper, and they often show also the traits of a free Renaissance. Then, later, one detects a tendency to an "Empire" character; this is seen in the frequent and known employment of broad and straight lines, which Wagner to-day, more than before, considers essential to modern architectural design. From the middle of the year 1880 Wagner becomes less constrained; he frees himself from the last vestiges of the student's recollections and from the powerful traditions of Vienna. His works then become the pictures and products of the present. Godfried Semper's proverb, "Artis sola domina necessitas," is his watchword. He concedes no other idea to construction but the end or object, no other beauty but comfort (this word must be taken in its wide, free and modern sense). Hereafter the character of Wagner's style of architecture cannot better be indicated than by referring to some of his views. There are few artists with whom theory and practice work so well together.

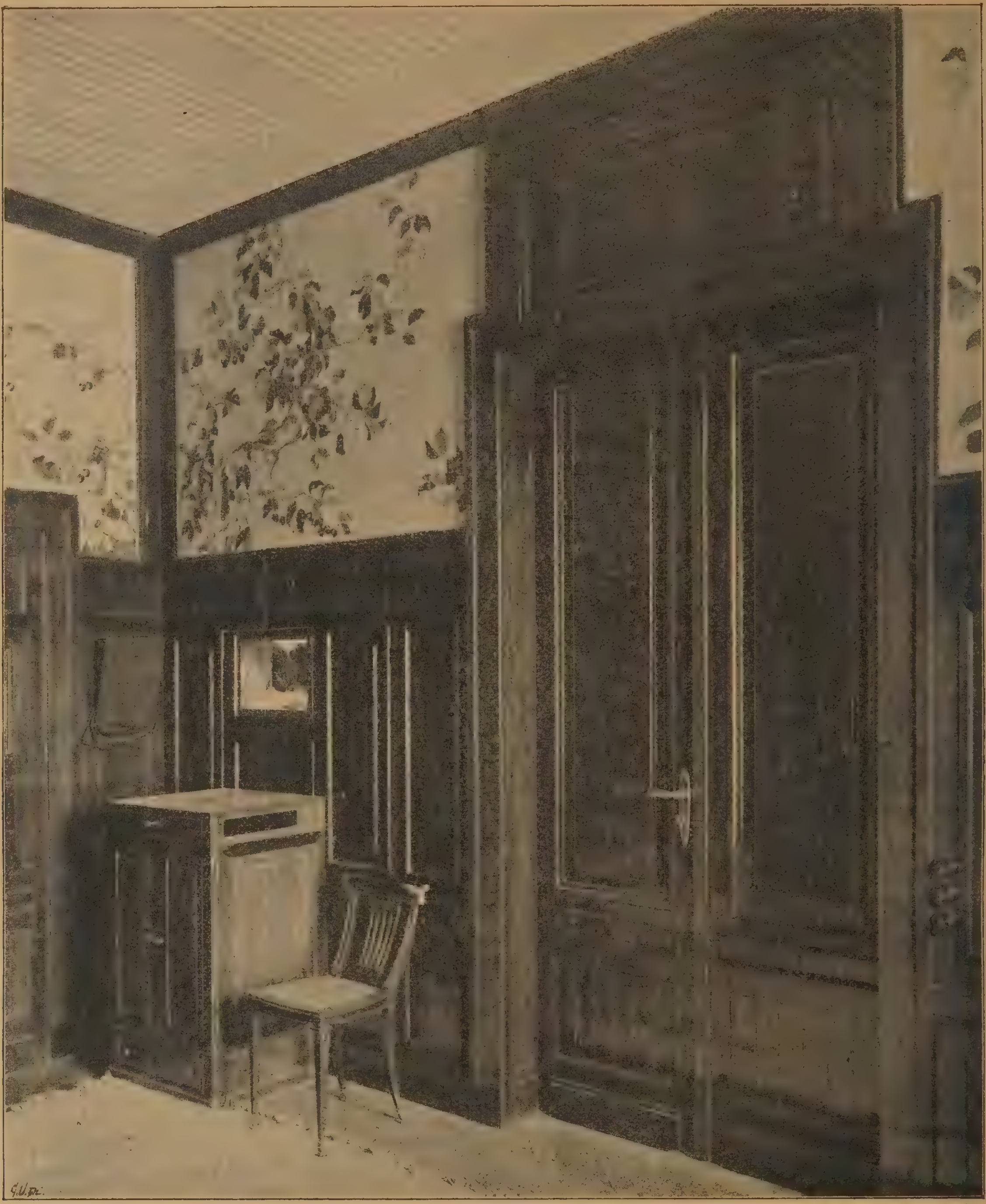
I have already spoken of the independence and freedom from tradition which Wagner considers a condition to good modern architecture. To believe the "Eureka" to be in this or that style, appears child'sh, and the really educational stimulant in art will certainly exclude such a tendency. But this higher and educational reform, as well as the use of all ideas and materia!s, must force us on towards a new style, the more so because this style of the future will be a utilitarian style; and by "Nutzstil" (utilitarian style) Otto Wagner means that style whose only beauty is the form of construction.



HOUSE AT VIENNA. T. M. OLBRICH, ARCHITECT.

As a first necessity Wagner recognises the abolition of anachronisms in art. Churches, dwellings, theatres and monuments must all be built after the same ground plan if they are to suit their ends, the dwellers and users. He holds that anything unpractical cannot be beautiful, and that every application of ancient forms must be unpractical on (so to speak) obvious æsthetic grounds. Wagner sets aside *a priori* all fixity of style. He takes no account of the employment of a basis of style, even if on a small scale. Every style is so born of the earlier one that new constructions, new materials, new human objects and considerations become joined to the preceding ones, and thus are created new models. An objectless movement to find a new style is considered by Wagner to be as unprofitable as it is foolish—a most gratifying view at the present time. Extreme artistic economy, dignity in the employment of materials, building to an end, no other ornament than the arrangement suited to the building, the greatest simplicity and symmetry—these are the rules of Wagner's architecture, and to them must be added the lesson not to build in styles. Each purpose produces its own design; and the same conditions as to purpose, position and material proportions may be repeated in various buildings.

A series of great Wagner productions already show a visitor to Vienna how faithfully the master harmonised his practice with his theory. Most prominent there is the State railway station, which is a witness that this architect's principal force is his boldness of conception. Here all technical difficulty is not only brilliantly overcome, but has grown, so to speak, even out of faults. The small space available for the station buildings has been cleverly utilised, and through the characteristic outline of the ever-varying but quite simple pavilion in white plaster, with green-lined ornamentation, the city has acquired a particularly effective addition. The harmony observed throughout the whole establishment and the simplicity of each portion of the details,



INTERIOR. OTTO WAGNER, ARCHITECT.

windows, doors, catches, &c., are the result of an inexorable strength of logic, to derive the form of everything from its "comfort," object and use. The other buildings of Wagner show the same main features. Visible cross beams, a clear facade exposing the interior arrangement, the wonderfully graceful though not at first sight imposing staircases, are the special qualities of his dwelling-houses.

During later years he has freely employed colour for his facades, but the way in which he uses it is so safe that one cannot speak of a wandering from the spirit of architecture, but only of enlarging architectural limits and possibilities. In this his students are less reliable, as may be seen from certain samples in the work "Aus der Wagnerschule," published by A. Schroll & Co., of Vienna.

As an architect of interiors Wagner comes still from the Makart age. This can be clearly seen in his works of the year 1880. He had first to break himself loose from the carved ceilings, heavy stuffs and unmeaning ornaments, and in this also he was was the foremost in Vienna. He employed his architectural ideas wholeheartedly in the interior equipment, only here he enjoyed greater possibilities in the matter of colouring. Otto Wagner is a prime factor as a stimulator in Austria, and, indeed, in modern Continental architecture. There is no young artist in Vienna who does not owe him much.

T. M. Olbrich is no scholar of Wagner's, but like the great Vienna architects, Josef Hoffmann, Max Fabiani, Leopold Bauer, he served for a time in his workshop. There is some of Wagner's spirit in Olbrich. The leading ideas of the new art practice, appreciation of uses and beauty of purpose, have also entered his blood. But a world lies between Wagner and Olbrich. Their work may be similar in spirit, and the chief capacity of both men lies in the same direction—both are great in conception and design—yet Wagner is at the one pole and Olbrich at the other in Austrian decorative art. There may be works that indicate presumably their mutual sympathies, which seem to attract each other; and it may even be that the one appreciates the other. To me the existence of these two appears a complete contradiction. Otto Wagner builds for people of to-day. His architecture is logic translated into thought by an artist. He is a man of the present. His art must have as its highest aim the expression of modern life at the highest limit. Olbrich's architecture has other aims. He is rather a free artist than an architect. He builds less with an eye to the present than to the future. He designs houses not for those who order and pay for them, but for the children who will be born and brought up in them. "Perhaps," he may say, "the interior I am now planning will not suit these people. They are too fine, too subtle, too clear and too phantastic, too artistic and too uncitizenlike. But children grow up there whose early years, through the colours of my ceilings, friezes and walls, will be educated to artistic conception and so will be cultivated."

We must indeed often see this carried out in Olbrich's works. A house or room is built according to the needs of their future users. "Olbrichism" would revolutionise (metamorphose) the inhabitants. One is forced to think half in earnest and half ironically on the phrase of Ruskin: "Each man must work to better his kind, even if he himself doesn't wish it." The good and bad sides of Olbrich's art are clear. That environment changes men is unquestionable.

To me there is no doubt that the next generation will see a much more developed colouring and sense of outline than we do. But to cultivate a man by the rooms of his house seems to be very far-fetched. There is an element that, united with many others, must have good results, but the question is otherwise an open one—whether the artistic phantasy of a man may be strong and reliable enough to excite the following generation, or an exciting and fantastic be decreed as too theatrical.

T. M. Olbrich is doubtless a genial architect. His defect lies in his being too anticipatory, and moreover his construction is often not sufficiently secure. His fancy misleads him to constructions which are artistic shams. For a long time he has employed far too many curves—even boxes and beds he works out in curves; but he appears to have calmed down now. He has, however, done much for Viennese decorative art, though he has now left the city and is building for the Grand Duke Ernst of Hesse-Darmstadt his "Artists' Colony." If he could limit his fancy within architectural bounds he could do much. His activity is now often only a promise for the future. It is not the time to speak further of the other Viennese artists (J. Hoffmann, Adolph Loos, Leopold Bauer, &c.). I am now dealing only with Otto Wagner and T. M. Olbrich, for they are the characteristic representatives of the new Viennese style, and up till now have most increased the store of design.

[NOTE.—*We do not hold ourselves bound by the opinions expressed in this article, nor do we necessarily commend all the buildings illustrated. Our object in publishing the article is to give readers in this country an idea of the aims and methods of modern Austrian and German architects.*—ED. B.J.]

THE PROPOSED OFFICE BUILDING FOR THE STRAND.

AT a cost of £2,000,000 it is proposed to erect on the Strand an office building, on American lines, which it is asserted will be "the largest and handsomest structure of the kind in the world." The English-American syndicate who have the matter in hand submitted to the London County Council last Wednesday a written application for a 999 years' lease of the island site, with a small exception, fronting upon that portion of the Strand now being cleared for the Crescent Road in connection with the new thoroughfare to Holborn. This represents the space between the Law Courts and Wellington Street. The exception lies at the Wellington Street end, where a corner site that will be divided from the remainder by a short roadway is reserved for the Gaiety Theatre and two other buildings. The site of the proposed building has a frontage to the Strand of 750ft., with even longer frontages to the adjoining new streets which are being opened. It has an area of 125,000 sq. ft. The architect's drawings, which accompany the application, show that the entire building will be seven-storeys high, but a portion will have three more storeys, the whole of steel construction, with sandstone exterior. One of its special features will be a rotunda, under a lofty dome, in the centre of the building, intended to form a general rendezvous. The basement will consist of extensive safety-deposit vaults, a large restaurant, engines, boilers and machinery for furnishing heat and electric light, and the power necessary for running thirty lifts. The ground floor will contain special accommodation for banks and insurance companies requiring large rooms, and for shops. The upper floors will be given up to offices. It is estimated that the actual floor-space available for letting purposes will amount to 900,000 sq. ft., and that there will be more than 6,000 rooms in the building. It is also estimated that the annual maintenance charges will be about £35,000, and that the construction will probably take 2½ years.

The Competition for Walton-on-Thames Municipal Buildings, &c., has been decided in favour of Messrs. Mackintosh & Newman. The second premiated design is by Mr. George Sedger, and the third by Mr. Sidney Tatchell, all of London.

Law Cases.

Hastings Builders' Bankruptcy.—The statement of affairs of Messrs. Moon & Garner, builders, of Hastings and Bexhill, shows liabilities amounting to £16,719 and assets £2,835, leaving a deficiency of £13,833 15s. 4d.

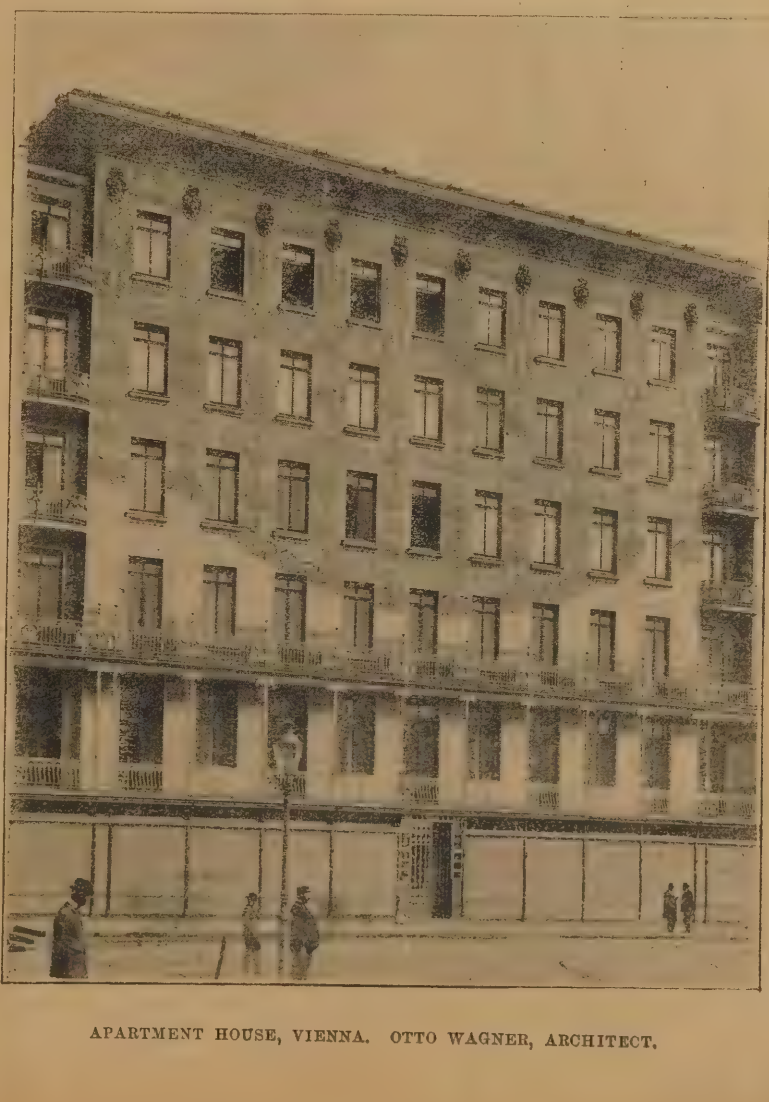
A Crawling-Board is not "Scaffolding" within the meaning of section 7 of the Workmen's Compensation Act. This was the decision of the Master of the Rolls in the case of *Veasey* v. *Chattle*, which came before the Court of Appeal on Saturday last.

Menacing an Architect.—At Bow Street Police Court last Friday William Edge, who was charged with threatening Mr. James Neale, architect, of Bloomsbury Square, with a revolver (as reported on p. 254 of our last issue), was bound over in £200 to keep the peace, finding two sureties in £100 each.

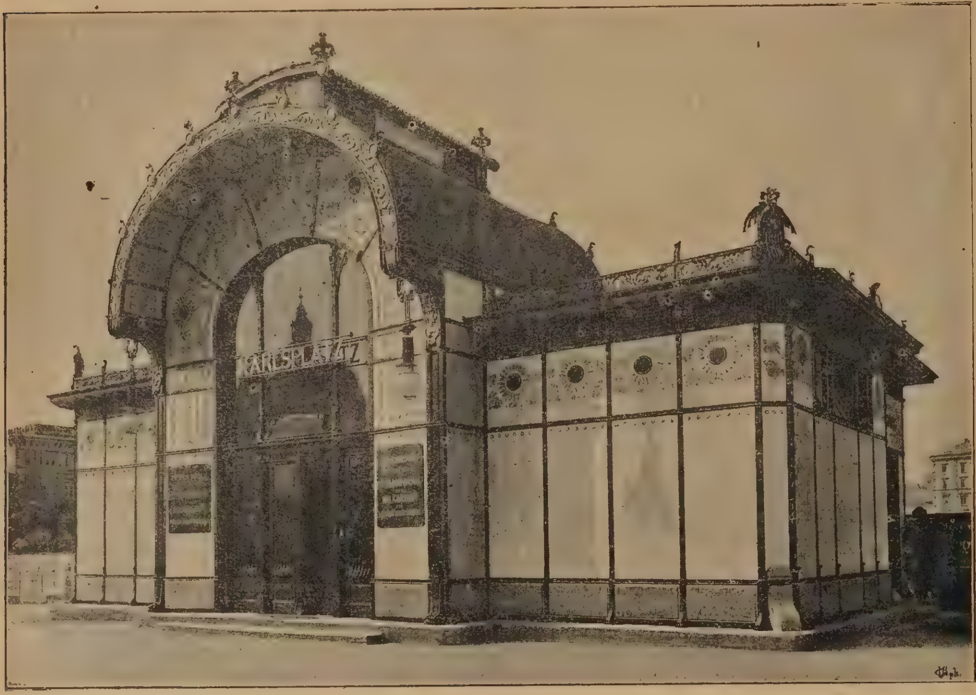
Abortive Prosecutions.—At the instance of the Knaresborough Urban District Council five charges of breaches of the building by-laws were recently preferred at the Knaresborough Petty Sessions against Mr. Joshua Naden, builder, and a former member of the Council. The first charge was that the defendant commenced to build a stable and shed in the yard of the Crown and Cushion Hotel without having notified the surveyor. For the defence it was contended that the erection was not a new building, and did not come under the by-law. The case was dismissed, whereupon two other charges bearing on the case also fell through. The fourth charge was that the defendant had commenced a new building in Raw Gap without giving notice in writing to the surveyor. It was stated that he was converting three coal-houses into a wash-house. This case was also dismissed, the defence being that it was not a new building. The fifth charge was that the defendant broke open the road in Briggate without the sanction of the Council. The Bench also dismissed this case.

LEEDS AND YORKSHIRE ARCHITECTS.

THE opening sessional meeting of the Leeds and Yorkshire Architectural Society was held at Leeds on Thursday last, the president (Mr. Butler Wilson) occupying the chair. During the evening prizes were distributed to the successful students. Mr. S. R. Day, of Skipton, won the prize for measured drawings, and to Mr. J. Hinchcliffe, of Chorley, four prizes (making a total of eleven guineas) were presented. A letter was read from Mr. George Corson presenting to the Society the portrait of himself (by Mr. H. Willson) which had been given to him by the members of the Society. Mr. Corson was the Society's first president when it was founded twenty-five years ago.—Mr. Butler Wilson, in the course of his inaugural address, urged students to be enthusiastic in their work, and to thoroughly search into the details of their art; and there could be no better foundation on which to build the temple of their education than working for the qualifying examinations of the Royal Institute of British Architects. To practising architects he offered the suggestion that unselfishness should be the keynote of their work. With regard to competitions, he considered their conditions were usually unfair and unreasonable, and with the object of inducing persons to proceed on proper lines the Society proposed to appoint a standing Competitions Committee; and whilst speaking of this matter the president referred to Liverpool Cathedral, expressing the opinion that the commission should be placed with Mr. Emerson, the winner of the competition held fifteen years ago. In conclusion he drew attention to the arts and crafts societies; one should guard against a tendency to stifle new and crude ideas and should give the "art-nouveau" their earnest and helpful consideration when the exigencies of the case demanded it.



APARTMENT HOUSE, VIENNA. OTTO WAGNER, ARCHITECT.



RAILWAY STATION AT KARLSPLATZ, VIENNA. OTTO WAGNER, ARCHITECT.

BRICKLAYING AND TRADE-UNIONISM.

SOME IMPORTANT FACTS.

A HIGHLY interesting and important series of articles on the crisis in British industry is now being published in the columns of the "Times." The first, which appeared in the issue for November 18th, dealt with the increasing adoption among bricklayers of the principle to "ca' canny" or "go easy"; and as the matter is of vital interest to architects and builders we take the liberty of reprinting the more important of the statements made. The "Times" says:—

A man may be employed and paid for ten hours, but there is a steadily-growing disposition to put into those ten hours only eight hours' real effort, while those engaged for eight hours will give only six hours of their energy, and so on. The whole system, as now being worked, is, in fact, the direct outcome of trade-unionism coupled with advanced socialism. In its mildest phase it takes the form of keeping the strong, efficient and willing worker down to the productive level of the weakest and most inefficient; and in its worst aspect it amounts to deliberate cheating—that is to say, a man accepts wages as the price of his whole capacity and energy, and gives only a half or two-thirds of them in return.

Number of Bricks Laid in a Day.

Though there is no rule as to the precise number of bricks a man shall lay in the course of his day's labour, there is a well-recognized unwritten law on the subject, which a bricklayer will disregard at his peril. Twenty years ago a bricklayer would lay his 1,000 bricks a day when on ordinary work. Thirty years ago the bricklayers employed on railway-tunnel work in London laid even 1,200 a day. But the unwritten law now in force declares that a bricklayer engaged even on ordinary work must "go easy" and not lay more than 400 in the day. He will thus "give another man a chance" by helping to render it necessary for more hands to be put on.

The maximum of 400 bricks per day is the "recognized" limit for dwelling-houses, shops and business premises built by a private contractor. In the case of public buildings, and especially London County Council and London School Board work, the limit is considerably less. It is to be feared that the London County Council must be held responsible in no small degree for the development of the "go easy" practices in the building trades generally. Thus, a firm of contractors had a job on hand in the East End of London, and complaint was made to some of the bricklayers—who could easily have laid from 600 to 700 bricks a day—that they were not doing enough. The reply they gave was: "The London County Council limit is 330 bricks the day. That is what they consider a fair day's work, and we are not going to do more for you or anyone else."

The Increase in Wages and its Effect.

Had there been any decrease of wages there might have been some excuse for the adoption of "go easy" principles. But the contrary is the fact. The wages have gone up substantially of late years, but instead of more work being done for the extra money there is less. The combined effect on the cost of labour has been such that, whereas a plain wall could have been put up ten years ago for from £12 to £14 per rod (272ft.), such a wall would now cost from £20 to £22 per rod. Allowance must, of course, be made for the increased cost of bricks, though 10 per cent. of this increase is due to the fact that the brickmakers adopt similar tactics to the bricklayers; but the average cost of labour alone in brickwork (exclusive of pointing) has increased from £3 to £6 per rod in the last ten years.

Not the Bricklayers Alone at Fault.

It is not against the bricklayers alone that complaints of "go easy" practices are brought. From the navvy who digs the foundations to the painter who puts on the last coat of varnish, all the men engaged in the building trades are declared to be "tarred with the same brush" in regard to doing less work for more money, especially where there is any lack of proper supervision. And, unfortunately, unless he makes up his mind to resort to exclusively non-union labour, the average master-builder is practically at the mercy of his men.

Foreign Joinery.

The ready-made doors from Sweden, sold here at 9s. 6d., would cost 13s. 6d. if made in England with the same wood and with similar machinery. A substantial trade has also sprung up of late years in Swedish window-sashes and frames, to the further detriment of our own carpentering trade; while architrave mouldings for doors and window frames are brought from Sweden and extensively sold here at one-third the cost of English mouldings.

In these directions the builder who is not engaged on really first-class work can obtain a certain set-off against English rates of labour, but his general position is that of being handicapped all round. Thus, he has not only direct troubles in dealing with his own men, but indirect worries owing to disputes and rivalries among the different unions.

There is, on the whole, more toleration of non-union labour in the building trades than was formerly the case; but in many instances the non-unionist is still subjected to systematic annoyance, and even to persecution, at the hands of the unionists when they can resort to such practices without danger to themselves. It is certain that a working man cannot be expected to fight out the matter with his union, and in some very shameful cases that have occurred the men have seen no alternative but to surrender to the despotic commands of the union officials.

Society Men and Non-Society Men.

Still another class of troubles is represented by an incident that occurred recently at Bath, where 100 masons and bricklayers left a job rather than work with five society men who had not paid certain penalties imposed on them, the strikers insisting that either the men should pay up or the firm should discharge them. The five would not pay, the firm would not discharge them, and so the 100 struck work and remained out until the local officials ordered them to return.

As the outcome of all these disputes, rivalries and squabbles among the men themselves a further augmentation in the cost of production takes place, and the eventual sufferers are the public, who either have to pay more for their houses or have them constructed in a jerry-built manner.

The Remedy.

An effective remedy for the present state of things in the building trade will not be easy to find. If the whole of the masters could show as much backbone as certain individuals among them do, and if they formed a solid and compact body, providing a common fund, there would be a better chance of overcoming trade-union tactics. On the other hand, it is feared that as long as municipal bodies like the London County Council remain what they are—their labour members returned by extremely active labour organizations getting the controlling voice on labour questions and playing into the hands of the trade-union workers—so long will it be practically impossible to place the trade on a satisfactory footing.

The foregoing statements of the "Times," so emphatic and so sweeping, are supported by Mr. Thomas Costigan, secretary of the London Master-Builders Association.

Mr. Costigan's Views.

In drawing attention to the various conditions of contract which are used by public bodies and by individual architects, he says:—Some of these conditions of contract contain clauses which operate very harshly on master-builders. So far as public bodies are concerned, their demands are in a large measure the result of political intrigue with trade-unions, but the same excuse cannot be advanced by architects as a justification. Architects know perfectly well the difficult middle position occupied by the master-builder, between the building employer on one hand and the workmen on the other. Modern trade-unionism is doing its best to strangle the building trade. As an example of the loss caused to a particular trade, we have the growing use of substitutes for plastering and the almost total extinction of the old artistic work in which our plasterers were formerly pre-eminent.

A Reply.

The assertions of the "Times," however, as might be expected, do not meet with universal approval. Thus, Mr. James G. Hutchinson says:—Just as any sort of stick is thought good enough with which to beat a dog, so any sort of argument is made to suffice with which to belabour the British workman. He has quite enough blame to bear which can be legitimately laid on his shoulders without being condemned for any remissness from which he may as often prove to be the victim as the aggressor. For instance, we are again being told that the unwritten law of the trade-unions will not permit a man to do more than a certain quantity of work per day. But whose fault is this? It looks as if the employer was not the master in his own workshop; it seems as if he was afraid to "sack" a man. I am further thoroughly convinced that the great body of workmen in the building trades would be more amenable to reason if there was less of the standoffishness shown by many employers. The workman's and the employer's interests are not identical, although they need not necessarily be antagonistic. It is the employer's interest to get as much work out of a man as he possibly can; while it is the workman's interest, or inclination, to give as little labour for his wages as will ensure his retaining his employment. I am conscious that this is a very low view to take of this phase of the question, though I am sorry to believe it is the true one. As an artisan and foreman of works, I am free to admit that trade-unions are a disturbing influence in the labour market; but at the same time I consider them essential as a protection from the otherwise untrammelled power of capitalism. Their greatest drawback, to my mind, is the hard-and-fast rule with reference to standard rates of wages—it being this rule which has the most to do with the restriction of the output so far as the superior men are affected.

Mr. William Woodward.

Mr. William Woodward, A.R.I.B.A., corroborates the "Times" to the full. He says:—Unless one is wilfully blind it is impossible to avoid the blatant display of non-work which meets one at every visit to a building. The foreman, to whom one formerly looked to see that a reasonable amount of work was being executed, is so terrorized by the hundred-and-one ways in which trade-unionism can make his life a misery, that he dare not put his foot down upon the swindling of labour which is going on. It may be said, What business is it of the architect to intervene in labour questions? The business is this, so far as I am personally concerned: I find buildings costing 25 per cent. more than they cost twenty-five years ago,

> "Not because of the shorter number of hours on the building, not because of any serious rise in the price of materials, not because the men are paid too much per hour, but solely because they are subject to the unwritten but well-understood law that their duty on the building is to carry out the doctrine of idleness and to do their level best to consume the greatest possible amount of time in producing the smallest possible amount of work."

(The foregoing is a quotation from my article on "The British Workman and his Competitors" in the "Nineteenth Century" for March last.) And it is not only cost, but delay in completion. I know all about the retort that we try to rush our buildings. Nothing of the sort; it is the 500 bricks instead of the 1,000; it is Mr. Plasterer playing a game of cards on the building during working hours; it is (a matter within my own knowledge) a threat to strike unless a drunken man is kept on the building; it is Mr. Plasterer, again, who will not allow a bricklayer to fix a tile 6in. by 6in., but will allow him to fix one 9in. by 9in.; it is the same gentleman who spoilt some stable-paving being done for me because he insisted that "granolithic" was plasterers' work, and not that of the bricklayers, who were doing the work properly; it is Mr. Bricklayer, this time, who has suddenly taken it into his head that roof-tiling is his work, and not

INTERIOR OF HOUSE AT VIENNA. T. M. OLBRICH, ARCHITECT.

that of the regular expert tiler who has hitherto made tile roofs the success they are; and so on with innumerable interferences in the work, all tending to inferior finish, all to delay, and all to absurdly enhanced cost.

At the L.C.C. Meeting.

At last week's meeting of the London County Council, on the reception of the Finance Committee's report, Captain Swinton asked the chairman if his attention had been called to the statement that the bricklayers of the Council laid 330 bricks per day, which was 70 less than the recognised number. Lord Welby, in reply, said there had been great activity in the building trade recently, and there had been a difficulty in obtaining that class of labour, and the bricklayers did not lay the number of bricks in a day which would be considered fair, but lately the manager reported that the number had been increased. He could not go beyond that at present. The attention of the Sub-Committee had been directed to the statement, and they would in the course of the week continue to investigate it and see how far the statement merited confirmation.

A Leeds Master-Builder's Experience.

A Leeds master-builder, confirming the statements made in the "Times," says:—Two years ago I had a contract of which about £70 was paid in labour. An exactly identical contract which I am now carrying out will cost me £15 more, on account of the men not doing the work they should do. The cost of labour is getting so great on account of the men's idleness that we cannot afford to go on building because people will not buy at the price.

The Position in Yorkshire.

The "Yorkshire Daily Post" says:—The unfair practices denounced by the "Times" are in no sense new to North-country builders. They existed several years ago, but it was not until the lock-out of 1899 in Yorkshire that public attention was called to them. Among the specific complaints were the following: 1. (*a*) Compelling foremen, who represented the employer, to join the operatives' union, thus becoming their servant rather than the employer's. (*b*) Refusal to work until the foremen joined the operatives' union. 2. Refusal to work along with non-union men, and coercing non-union men to join their unions. 3. (*a*) Dictating to the employer which workmen shall do certain work, and not allowing the employer any voice or choice in the matter. (*b*) The practice of withdrawing all their men when such work is going to another trade. (*c*) Refusal to fix material worked or partially worked in any other district. Against these alleged tyrannies the Yorkshire master-builders fought hard and long, but they were not backed up by the southern and western members of the National Federation of Building Employers, and the result of the struggle was not much in their favour. Trade jealousies and rivalries are greater in the building trade than in other important industries, and the operatives, it is said, take advantage of it.

The Opinion of the Free Labour Association.

Mr. W. Collison, general secretary of the National Free Labour Association, notes with pleasure the exposure of the gross waste of time advocated by socialistic trade-union leaders and practised by their dupes—the trade-union workmen. He appends a resolution discussed at the ninth annual free labour congress, held in London in October last, urging non-union workmen to avoid losing time and to apply their best energies and skill in doing a fair day's work for a fair day's pay.

"Manchester" says: "I think the masters have the remedy in their own hands. They must absolutely refuse to employ trade-union foremen."

The Bricklayers' Point of View.

The bricklayers' view of the matter is given by "A Bricklayer's Labourer" who says in a letter to the "Times":—Your correspondent does not know the truth with regard to the bricklayer, his union, or his principles, as I will show. The union rate of wages varies from 6d. to 10d. per hour, varying with the district in which he is working. If he is working in a high-rated district—for instance, London or Newcastle—he receives 10d. per hour, or, for a nine-hours' day, 7s. 6d. Now, we all know of the old adage that the wrong is not so much in committing the offence as in getting found out. Sometimes the master-builder beguiles poor bricky with oily tongue and the price of drink at dinner-time because it is a hot or a cold day. One or two more bits of finesse and poor bricky has broken his union rules; he and his pals have made a clandestine contract to do so many hundred yards of brickwork at 2s. 6d. per yard. Then it is that the master-builder not only gets his work done cheaper and quicker, each bricklayer will build 4yds. of brickwork per day, for which, of course, he receives 10s., and as there are eighty-two bricks per sq. yd. he has only laid 336 bricks, only six more bricks than the County Council bricklayers. If your correspondent has any worthy men who can do a turn at that simple and fundamental matter of bricklaying, if they can lay 1,000 or 1,200 bricks per day, here in Newcastle is their America. The master-builders are paying nearly 3s. per hundred for laying them now; that would bring the worthy men in 30s. or more per day, nearly enough for a man who can write an article on fizzle. But the watch-dogs of commerce want something besides scraps for their barking (I should if I were watch-dog). Hundreds of flats are built in Newcastle and Tyneside every year. The finance companies advance 80 per cent. of their assessed value, which is £400; the builder pays all wages, material, and gets his own profit out of it. The finance companies then take them over and sell them for £625 to £680, or in a transaction which only lasts a few minutes make two-thirds as much profit as the whole cost of labour and material. I will spare your correspondent any more. I wonder what will be his next indictment to the British workman; he is very much what his masters have made him.

The Engineering Trades.

The engineering trades are dealt with in the second of the series of articles in the "Times." It is stated that the position in the engineering trades has greatly improved since the dispute of four years ago, the effects of the famous agreement then arrived at having been most beneficial to the employers, while they have also conferred advantages on the employed, though the conditions laid down by the agreement were at the time regarded as the harsh terms of a remorseless conqueror. Since then the men's society has prospered more than it ever did before, and the men individually have been getting better returns. Yet truth compels the statement that, while the leaders of the men employed in the engineering trades are beginning to see more clearly how the interests of the employed are bound up with those of the employers, and to understand the real nature of the conditions which the latter have to face, these newer ideas and this broader knowledge have not yet permeated the general mass of the men.

PROFESSOR CHURCH ON SMOKE.

AT a meeting of the Coal-Smoke Abatement Society held on Wednesday last Prof. A. H. Church, of the Royal Academy, in seconding a resolution by Sir W. Broadbent, testified to the damage to works of art wrought by coal-smoke. Smoke in its condensed form of soot was something more and something worse than carbon. It was carbon closely associated with tarry matters, moisture, sulphuretted hydrogen, sulphuric acid and ammonia salts. While the carbon tended to dirty and darken everything on which it fell, the tarry matters caused the soot to adhere, so that the moisture, the salts, and the acids injured and corroded the surfaces on which the soot was deposited. The absorptive power of carbon was known to be very great and varied, and it was to this power that must be ascribed a great part of the harm done to works of art by coal-smoke. A varnished oil-painting must in London be protected by a glass. When a few years ago he superintended the cleaning of Mr. Watts's great fresco in Lincoln's Inn Hall, he found that it was the tarry and corrosive soot that had drawn the veil of night over the entire picture. The action of smoke on metals was equally injurious, and architectural art suffered in the same way. He produced a piece of dirt from the underside of the moulding which encircled the stone gallery just below the dome of St. Paul's. This deposit, 2in. or 3in. deep, owed its blackness to 1 per cent. of carbon or soot. The bulk of the deposit was sulphate of lime, which owed its presence to the corrosive action on the stone of the sulphuric acid in the London air.

Builders' Notes.

Mr. H. Burchell, who was for many years a monumental mason at Hastings, died recently at his residence at Twickenham.

Bricklayers Rewarded for a Find.—A Hastings bricklayer named Poole and a bricklayer named Bouton, who found a hoard of sovereigns whilst working at an old house in George Street, have been awarded by the Treasury—the former £94 and the latter £106.

Seizure of Cement from Belgium.—An important seizure of a large quantity of Belgium cement has been made at Deganwy by H.M. principal officer of Customs. The "Lord Devon," from Antwerp, arrived at Deganwy with a cargo of cement consigned to Mr. Joseph Parr, builders' merchant, carrying on business at Bootle, Ramsey and Deganwy. On part of the cargo being discharged the remainder was found to be packed in bags branded on one side with the name and style of Mr. Parr, and on the other with the legend "Portland cement." The officer of Customs suspected something wrong, and has detained the cargo under the Merchandise Marks Act, and before releasing it he will insist upon every bag being being marked "Made in Belgium.

London County Council.—At last week's meeting a number of tradesmen's petitions against the suggested new by-laws with regard to the height of shop-blinds, lamps, &c., were presented; they were referred to the Building Act Committee.—The question of how many bricks were laid per day by the Council's bricklayers was discussed (see this page).—The Historical Records and Buildings Committee reported that additions to the Council's library had been received from Dundee, Copenhagen, Victoria, Moscow, New York, the Institution of Civil Engineers, the Society of Arts, the Lewisham Union, the School Board for London, and the Royal Institute of British Architects.—Mr. Davies stated that the Chief Commissioner of Works had given his consent for the Council to proceed with the widening of Piccadilly. At the next meeting authority would be asked for carrying out the scheme without delay.—Up to the present no name had been fixed on for the new street from Holborn to the Strand.—The Improvements Committee submitted an estimate of £3,500 for the construction of vaults extending 12ft. underneath the footways of the north side of the Strand, in connection with the Holborn and Strand Improvement. They deferred any similar recommendation with regard to the new street and crescent road. The report was adopted.—The adjourned report of the same committee was submitted dealing with the sale of two pieces of land—one in Southwark and the other in Hackney—for housing purposes. In the first case the valuer fixed the value of the land at £2,875, and in the second case at £1,250; but the Housing Committee asked that, in order that they might carry out housing schemes in accordance with the statutory obligations, the Southwark land should be sold to them for £1,432 and the Hackney land transferred to them for nothing. This was agreed to after discussion.—The Establishment Committee reported that additional office accommodation for the Council's staff was urgently required, more particularly for the housing of the working classes branch of the architect's department. They proposed to lease a new building in Charing Cross Road, containing eighty-nine available rooms, at an annual rental of £2,800, and to expend £1,600 on alterations, furniture and fittings. This recommendation led up to a general conversation as to the necessity for a new municipal hall and offices, and some hopes were expressed that the Special Sites Committee would report shortly. The proposal of the Establishment Committee was adopted.

TIDES AND SEWAGE.

Observations by Mr. Kaye Parry and Dr. Adeney.

AT a meeting of the Institution of Civil Engineers held on November 12th a paper was read on "The Discharge of Sewage into a Tidal Estuary" by W. Kaye Parry, M.A., B.A.I., M.I.C.E., and W. E. Adeney, D.Sc.

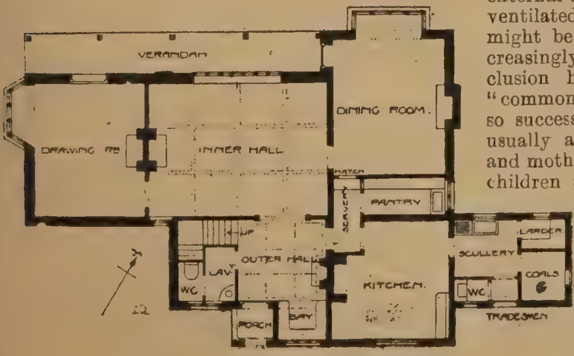
It was stated that the river Liffey, together with the tidal estuary, to which this paper referred, received the sewage discharged not only from the city of Dublin but from all the neighbouring suburban townships. The investigations described were intended particularly to ascertain the effect of the discharge of the sewage of two townships—Rathmines and Pembroke—into the tidal estuary.

The sewage was discharged from a tank sewer during the first five hours of each ebb-tide about a mile above the ends of the training-walls which enclosed Dublin Harbour; and it was found that at high-water of average tides the extent of the pollution of the river-water above the outfall was very slight indeed. This was obviously accounted for by the large volume of pure sea-water present in the harbour at high tide. Corresponding examinations of the surface-water at low spring tides showed that under these conditions the surface-water was distinctly more polluted. But the bottom samples collected at the same places and at the same times still remained comparatively pure.

For the purpose of ascertaining the relative proportions of sea- and river-water in the several samples collected, the total solids contained in each sample had been estimated. It was proved that at low water of spring tides the bottom waters of the deep-water channel from the Pigeon House Fort downwards consisted of a mixture of 5 or 6 parts of sea-water to 1 part of river-water, whereas the surface samples taken at the same time consisted of from 1 part of sea-water and 3 parts of river-water at the Pigeon House Fort to 2·1 parts of sea-water and 1 part river-water 1,870yds. lower down.

A number of analytical tables were given in the paper, and these went to show that the loss of dissolved oxygen even in the surface samples in the deep-water channel in no case exceeded 23 per cent. It was pointed out that although the sewage of about fifty or sixty thousand persons had been delivered untreated into this deep-water channel for eighteen years, no permanent deposits of any kind existed either near or below the outfall. In order to ascertain the relative volumes of sewage and clean water in the tidal estuary the discharges from the Rathmines and Pembroke outfall were observed and computed both at spring and at neap tides. The liquid which was then discharged consisted of sewage from which the heavier solids had been previously removed, together with considerable volumes of subsoil-water. The quantity of dry solids removed from the sewage might be taken as about 1⅓ ton per day.

It was stated that although the great dilution contributed materially towards disposing of the sewage by dispersing the organic matter, the resolution of this matter into harmless inorganic substances and gases by bacterial fermentation and other agencies did not take place to any large extent in the estuary itself, but was slowly effected after the liquid reached open water.



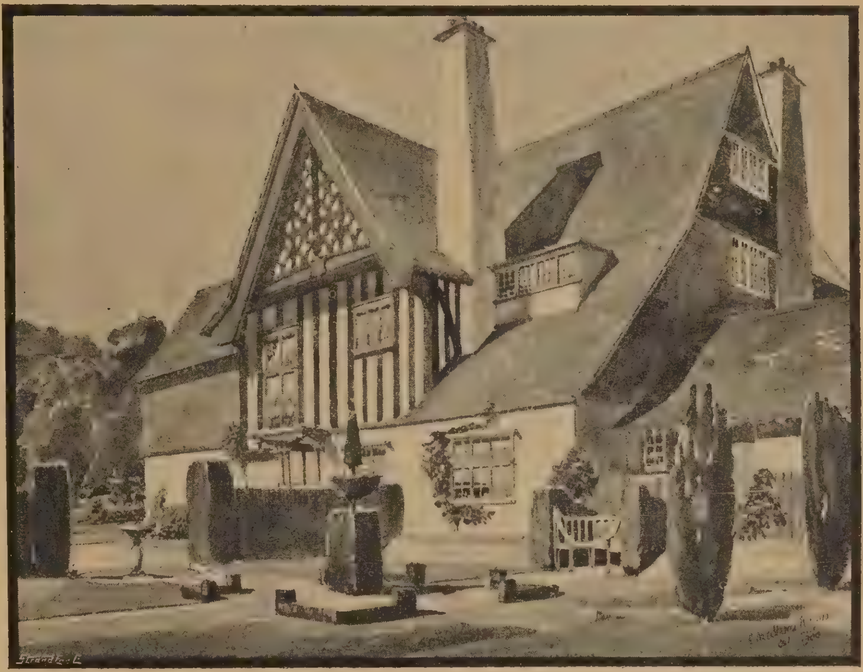
PLAN OF HOUSE AT REIGATE.

Views & Reviews.

Healthy Houses.

Dr. Sykes, the medical officer of health for St. Pancras, is such an acknowledged authority on public health that his opinions on the relation of this subject to the housing problem are sure to be of interest and value. So much has already been said and written about housing, that it is difficult to find any new matter, yet in this book many valuable statistics and tables are given, and the various types of houses are described and criticised in a wise and helpful manner. The evils of overcrowding are too familiar to need emphasis, and we can pass over this section of the book. More interesting reading is furnished by the chapters on back-to-back houses, tenements and flats, their respective evils and defects. Statistics show that the death-rate increases with the increase in back-to-back houses, and that as the width of the street diminishes the increase in the mortality becomes more and more marked; in fact, the healthiness of a dwelling in this country increases in proportion to the amount of daylight and sunlight admitted] to it. Dr. Sykes very properly insists that open spaces immediately contiguous to dwelling-houses should not be allowed to become merely barren wastes (like those facing Euston Road in his own borough), but should either be regularly cultivated or permanently paved, "instead of leaving it to vague by-laws that are difficult, if not impossible, to interpret." With regard to internal common staircases in compound dwellings, these are found to be unhealthy. They should always be external or against an outer wall, and be amply ventilated at each floor-level; and the same might be said of those "wells" which are increasingly found in flats. An interesting conclusion has been arrived at with regard to "common" washhouses. They have not proved so successful as anticipated, because they are usually at some distance from the dwellings, and mothers are disinclined to leave their young children and spend a large part of the day in the washhouse. "Associated" washhouses, or those of a single type allotted on particular days to each family, are found to be more satisfactory. Dr. Sykes, we are glad to note, has a good word to say for the London County Council and its workmen's dwellings. Among many other matters dealt with, it is pointed out that though a newly-elected or rebuilt house in the Metropolis cannot be occupied as a dwelling-house until the sanitary authority certifies that there is a proper water-supply, no similar certificate is required as to the drainage—an omission for which there is no valid reason. The book is printed on a hard light paper, and the type is large and very easy to read: altogether the "get-up" is excellent.

"Public Health and Housing." By John F. J. Sykes, M.D. London: P. S. King & Son, Orchard House, Westminster. Price 5s. nett.



HOUSE AT REIGATE. T. PHILLIPS FIGGIS, ARCHITECT.

Building Construction.

As a cheap elementary text-book for the first stage of the South Kensington examinations this book accurately fulfils its purpose. The author has wisely "not hesitated, in certain cases, to introduce a simple explanation of the theoretical considerations which govern the methods adopted in practice." He might with advantage have introduced more. At the end of each chapter questions are given, which may be of advantage in class-work. The illustrations are badly drawn, lettered crudely and often printed out of the square. In fact the get-up of the book is unprepossessing, though the information it supplies is clearly set forth.

"First Stage Building Construction," by Brysson Cunningham, B.E., A.M.I.C.E. London: W. B. Clive, University Tutorial Press, 157, Drury Lane W.C. Price 2s.

Associated Portland Cement Manufacturers (1900), Ltd.—The directors regret that their first year's trading should not allow a dividend on the Ordinary shares. This disappointing result is stated to be mainly due to the greatly increased cost of materials, more especially the high prices paid for fuel. No item of depreciation appears in the accounts.

House at Reigate.—This house, by Mr. T. Phillips Figgis, has recently been erected in the Croydon Road, Reigate. The leading feature in the plan is a large inner hall, suitable for receptions, &c. In addition to the accommodation shown on the ground floor, five bedrooms, a bath-room, &c., and linen-room are provided on the first floor, and two bedrooms, box and cistern-room on the second floor. The exterior is "rough-cast," with tile hanging and tile roofs, with the exception of the front gable, which is of half-timber work. The inner hall is panelled in pine, and ornamental lead-glazing has been provided throughout. The builders were Messrs. Nightingale & Sons, of Reigate.

Keystones.

A New London Board School has been erected in Cobbold Road Shepherd's Bush, at a cost of £20,000, and provides accommodation for about 900 children

A Bust of Samuel Richardson, presented by Mr. Passmore Edwards, and executed by Mr. Frampton, A.R.A., has been placed in St. Bride's Institute. The bust occupies a well-designed niche.

The Royal Apartments at Epsom Grand Stand are being extensively altered, and a new electric passenger lift, made by Messrs. Archibald Smith & Stevens, Queen's Road, Battersea, S.W., is being erected.

An Old Fable Modernized.—"Send portfolios to my parlour," says the Liverpool Cathedral spider. But the architectural fly, from bitter experience, knows what that "prettiest little parlour" means; so he fights shy of it and flies!

A New Church of All Saints at Petersham is now being erected by Mr. G. W. Heasler, of Richmond, from designs by Mr. John Kelly, architect. It will accommodate about 600 persons. The plan comprises a nave with north and south aisles, 70ft. long by 48ft. 6in. wide. The clerk of the works is Mr. Hayhoe, of Richmond.

New District Council Offices for Hendon have been erected, at a cost of £11,300, on the high road at Burroughs. Accommodation is provided for clerk, engineer, medical officer, sanitary officers, rate-collector, and the Hendon School Board. It was designed by Mr. T. H. Watson, architect, and has been erected by Mr. T. H. Kingerlee.

New Board School for Woodford, Essex.—At the last meeting of the Woodford School Board the plans by Mr. E. Tidman, C.E., architect, for a block of new schools to be erected in Snakes Lane for the Woodford Bridge and Ray Lodge districts, were adopted. The proposed schools will be a two-storey building, and will provide at first for 700 children (300 infants, 200 girls and 200 boys), with a provision for an extension to the total of 1,000 when complete. Mr. Tidman was instructed to submit the plans for approval to the Board of Education without delay.

"Formal Gardens in England and Scotland: their Planning and Arrangement, Architectural and Ornamental Features," is the title of a new book by Mr. H. Inigo Triggs, A.R.I.B.A., which will be published by Mr. B. T. Batsford shortly. It will consist of a series of illustrations mainly from old examples, with an introduction and descriptive accounts, comprising 120 plates 17in. by 13in., 70 of which will be from measured drawings and sketches by the author and 50 form photographs by Mr. Charles Latham. The work will be issued to subscribers in three parts, each 21s. nett. The illustrated prospectus promises a work of exceptional value and interest.

A New Church at Great Lever, Bolton, to be dedicated to SS. Simon and Jude, is being erected. The site is situated at the junction of Forester Street and Rishton Lane, and the west front of the church faces Rishton Lane. The tower at the south-west angle forms a conspicuous landmark. The church is arranged with a lofty nave, with pillars and arcading of Bath stone, also side aisles, large chancel transepts and side chapel, vestries and organ-chamber. The chancel is well raised, and arranged to allow of the congregation seeing and hearing the whole of the service, the accommodation provided being for between 600 and 700 persons. The style is Late Decorated Gothic. The church school, which has been completed and occupied for some time, is placed behind the church, fronting Forester Street. It is a two-storey building, on the centre-hall system, with classrooms at each side, and accommodates about 450, but is arranged for future extension to about 650. The materials throughout are red bricks and red Ruabon terra-cotta, the roof being covered with North-country green slates, and the joiners' work throughout being of pitch-pine. The whole of the works have been carried out from the designs and under the superintendence of Mr. R. Knill-Freeman, F.R.I.B.A., of Bolton and Manchester; Messrs. William Townson & Sons, of Bolton, were the general contractors.

New Municipal Buildings at Reigate have been opened.

Building Construction.—The serial article on this subject is held over till next week.

A New Miners' Club at Backworth has been erected.

The Age of Stonehenge.—Sir Norman Lockyer and Mr. F. C. Penrose calculate 1680 B.C. as the date of Stonehenge, from its orientation.

Change of Address.—Messrs. Heron & Bellairs, architects and surveyors, have removed from 27, Fitzroy Street, Fitzroy Square, W., to 27, Sackville Street, Piccadilly, W.

Mr. Alfred Waterhouse, R.A., who sustained a somewhat severe attack of paralysis in the summer at his Berkshire residence, maintains the improvement which recently took place and is deriving benefit from occasional drives.

The Parish Church of Weare, Somerset, which has been closed for alterations and repairs for eight months, has just been reopened. The restoration has been carried out under the direction of Mr. Edmund Sedding.

The New St. George's Parish Institute, Portsea, was opened recently. It is built of red bricks, with stone facings, and the hall will accommodate about 500 persons. Mr. G. C. Vernon-Inkpen is the architect, and the work has been carried out by Mr. A. W. Bevis, of High Street, Portsmouth.

Mr. Thomas Hardy (who, it will be remembered, began life in an architect's office) in his recently published "Poems of the Past and Present" gives a characteristic poem telling of a man who lavished his substance in building a church and making it entirely beautiful. He became poor, his heirs reviled him, and in the end he went and hanged himself in the church.

Finds in Pompeii.—Another house at Pompeii, the dwelling of M. Lucretius Fronto, unknown to history but evidently a wealthy man, has been unearthed. His name is recorded on a marble slab found *in situ*, where he is said to have been a strong and worthy man. The building is in good preservation. It is highly decorated, and the mural paintings in the triclinium are remarkable for their excellence of design and freshness of colour. Three of them are considered to be masterpieces. One represents Bacchus, Silenus and Ariadne. The other portrays Venus Aphrodite. The third, and perhaps the best, painting, evidently due to a Grecian artist, represents Perona offering her breasts to her old father Micon, condemned to die of starvation.

Edinburgh Architectural Association.—The associate members held an opening club night in their new room 117, George Street, on November 15th. Mr. A. Horne Campbell occupied the chair. There was a gathering of between eighty and ninety members and friends. A musical programme was provided. The first ordinary meeting of the associates section was held last Wednesday, Mr. J. Stuart Syme in the chair. Mr. W. S. A. Gordon delivered a lecture on some of the cathedrals of England. Special reference was made to Canterbury Cathedral, the history of which Mr. Gordon traced from the landing of St. Augustine in England up to the present time. Brief sketches were also given of the cathedrals of York and Beverley and Wells.

Stockport Town Hall Competition.—At a meeting of the Stockport Municipal Buildings Committee the application of architects for permission to compete in the designs for municipal buildings were opened. There were no less than sixty-seven applications. The number was at length reduced to fifteen, and a sub-committee was appointed to draw up the conditions and also to make inquiries into the qualifications of the different competitors. The fifteen competitors who are now under consideration are: Briggs & Wolstenholme, Blackburn and Liverpool; Derbyshire & Smith, Manchester; Alfred W. Cross, London; James G. Gibson, London; Henry T. Hare, London; William Hill & Sons, Leeds; Holton & Fox, Dewsbury; S. R. J. Smith, London; S. B. Russell & C. E. Mallows, London; Geoffrey Brady, Stockport; Arthur G. Wilkinson, Stockport; C. R. Locke, Stockport; Stott & Son, Manchester; A. Bramwell Thomas, London; Woodhouse & Willoughby, Manchester.

Kew Cowl Tests—In the ninth line of the second column on page 240 of our last issue "appropriate" is printed instead of "inappropriate."

The Manchester Fire Station Competition.—The whole of the designs submitted in this competition will be on view at the Manchester Town Hall to-day, to-morrow and Friday, from 10 a.m. to 3 p.m. Twenty-eight sets were submitted.

The Annual Dinner of The Manchester Society of Architects was held on Thursday last. Mr. Alfred Darbyshire (the president) occupied the chair, and among those present were the Lord Mayor of Manchester (Alderman Hoy), Mr. William Emerson, P.R.I.B.A., Mr. Edward Salomons, and Mr. Alfred Hopkinson (Principal of Owens College). Mr. Salomons advocated the appointment of a city architect, but the Lord Mayor considered it was much better for the buildings of Manchester to be the result of open competition.

The Society of Designers held a meeting on November 19th, Mr. F. Hamilton Jackson, R.B.A., in the chair. Mr. George C. Haité lectured on "Pattern Design and Designers of the Nineteenth Century." He classified the designers into three groups: the early pattern designers in dress material whose work culminated in the forties or fifties; the architectural school, led by Pugin. Burges, Godwin, Owen Jones and others which culminated in the seventies; and last, the purely decorative design of to-day. The old pattern designers were nearly all descended from Huguenot stock and lived mostly in the villages on the river Wandle, the water of which had peculiar properties most suitable for washing out dyes, and where the mills were chiefly situated. Mr. Haité in particular objected to the intervention of the middleman, who dictated to the manufacturers and designers upon questions of design, assuming to know the taste of the public, which no man did. Mr. F. Hamilton Jackson referred to the difficulty of selling good designs for wall-papers, for the design which looked best in a book did not look best on a wall; large screens on which they should only be shown were cumbersome, and both agent and middleman always sold from the book.

Engineering Notes.

Mr. W. A. Paley has been appointed to succeed the late Mr. Palfreyman as engineer at the House of Commons.

H.M. Revenue Offices, Liverpool, have lately been warmed by Messrs. John King, Ltd., engineers, Liverpool, by their improved "Rahnee" radiators fitted with patent "Rex" radiator valves.

The Rhyl Electric Light and Destructor Works were opened recently. The works are the largest in North Wales, and cost £30,000, including provision for electrical traction. Sixteen miles of cable have been laid.

Newcastle City Engineer.—The Newcastle City Council have appointed Mr. Frederick James Edge, assistant city engineer of Liverpool, to be city engineer of Newcastle at a yearly salary of £1,000.

Electric Lighting Boards (British Manufacturing Co.), Ltd., have transferred their sales department to 9, Grosvenor Mansions, Victoria Street, Westminster, which will serve as the head depot and to which address all enquiries as to goods should be made. The company's counting-house has also been transferred to this address on November 1st.

The British Institute of Certificated Carpenters visited the new Vauxhall Bridge works on Saturday, and were shown a recently constructed large model of the principal span of the new structure made of Portland concrete and faced with granite. The bridge will be constructed entirely of the same material, and, as explained by the resident engineer, Mr. D. Wells, will not, like some of the other London bridges, require annual or constant repairing, but will be stronger in forty years than when first built. It is expected that the work will be completed in a little over five years' time. There will be two lines for electric trams across the bridge.

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Supplement to
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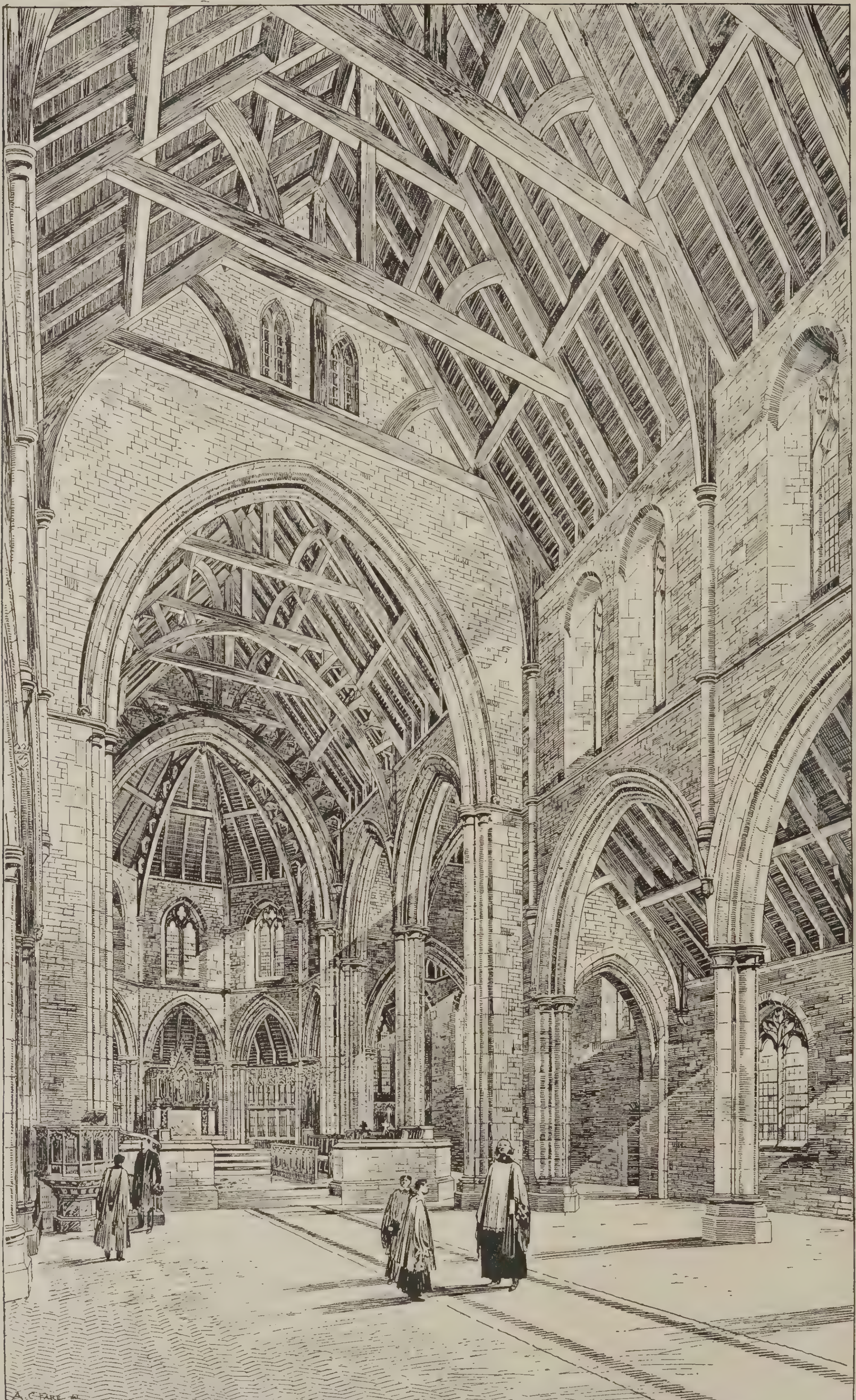
Wednesday, November 27th, 1901.



NEW CHURCH OF ALL HALLOWS, EASTON, BRISTOL.

George H. Oatley, F.R.I.B.A., Architect.

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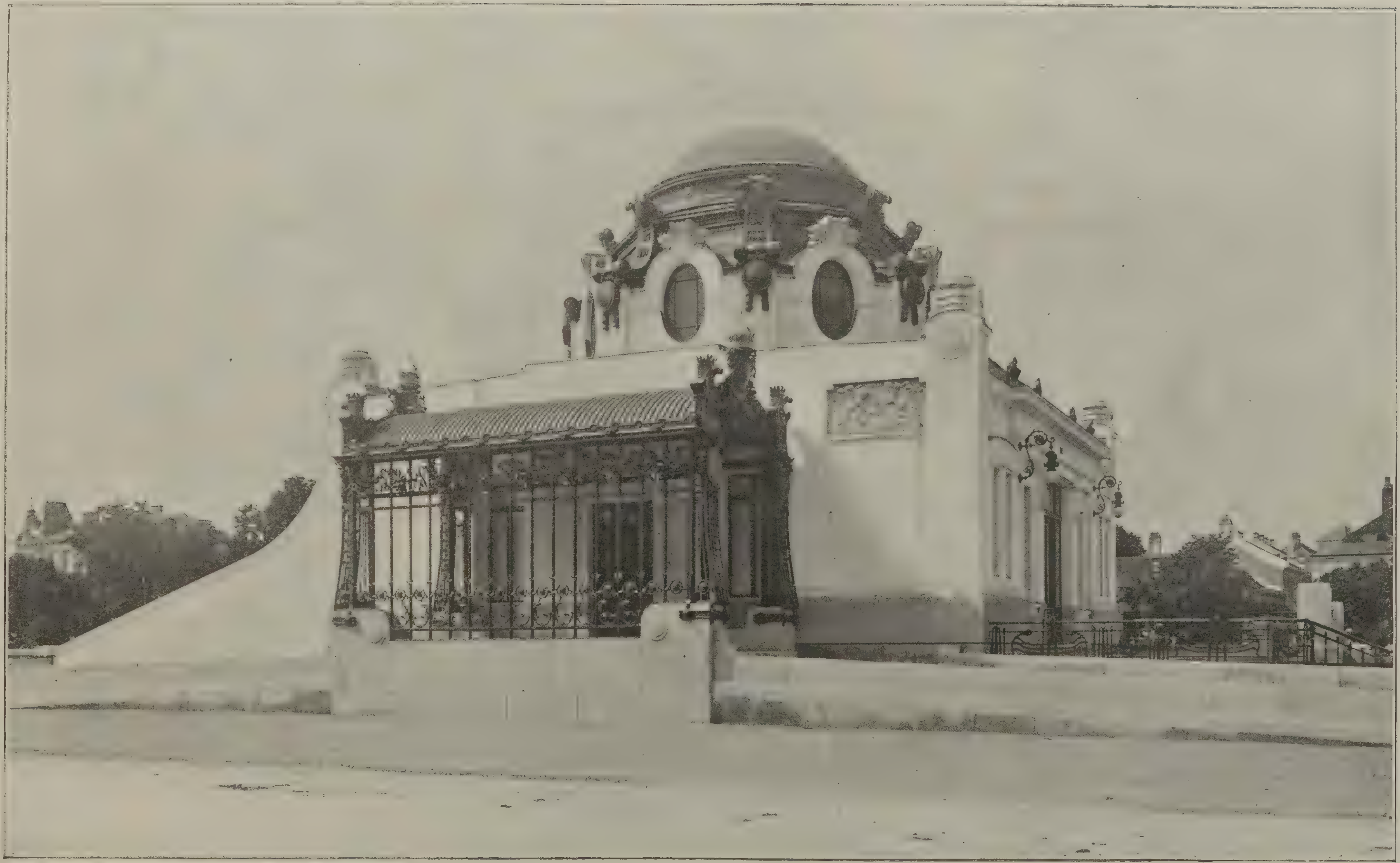

STATE RAILWAY STATION, HIETZING, VIENNA. OTTO WAGNER, Architect.

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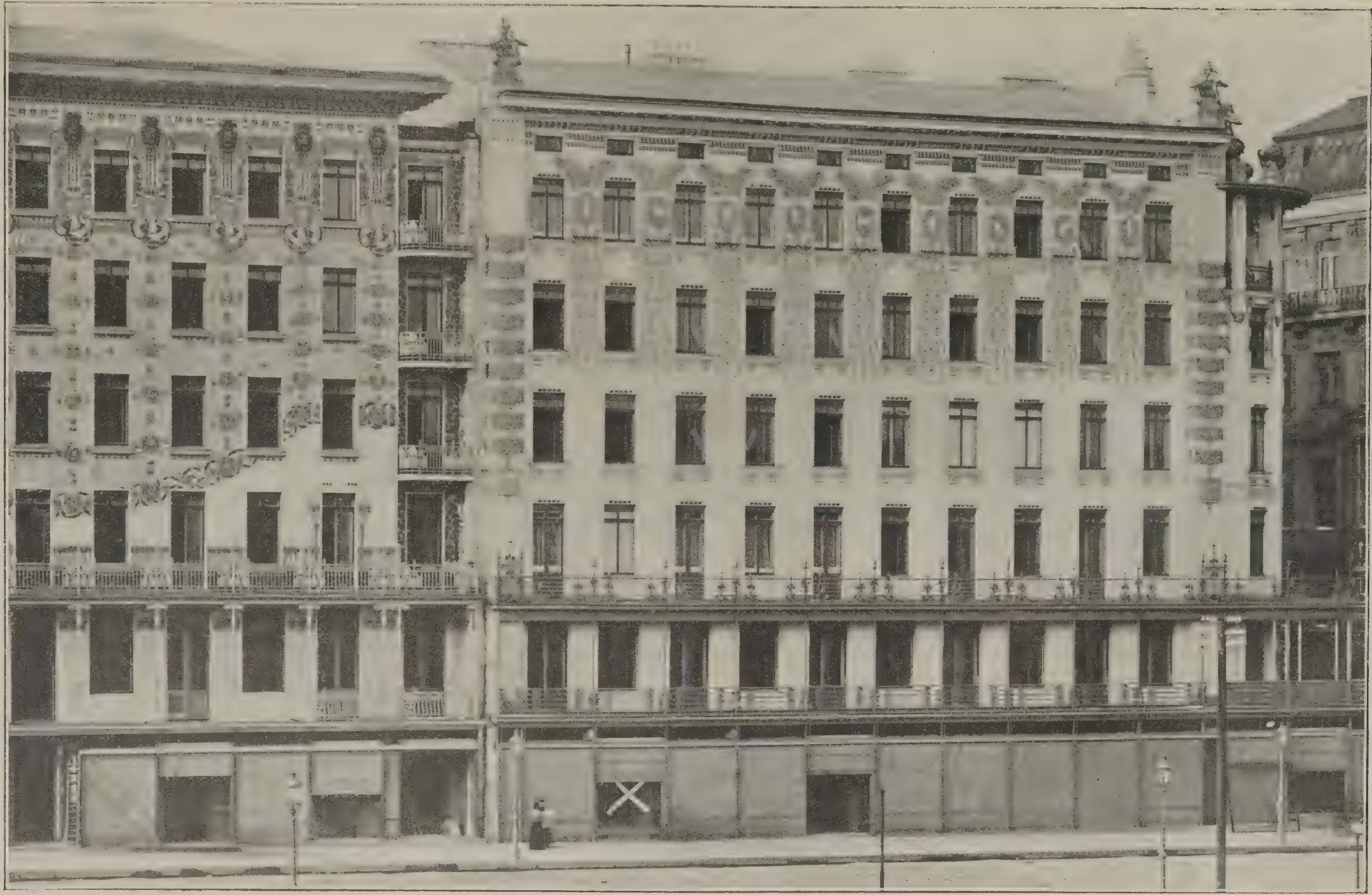

TWO APARTMENT HOUSES, VIENNA. OTTO WAGNER, Architect.

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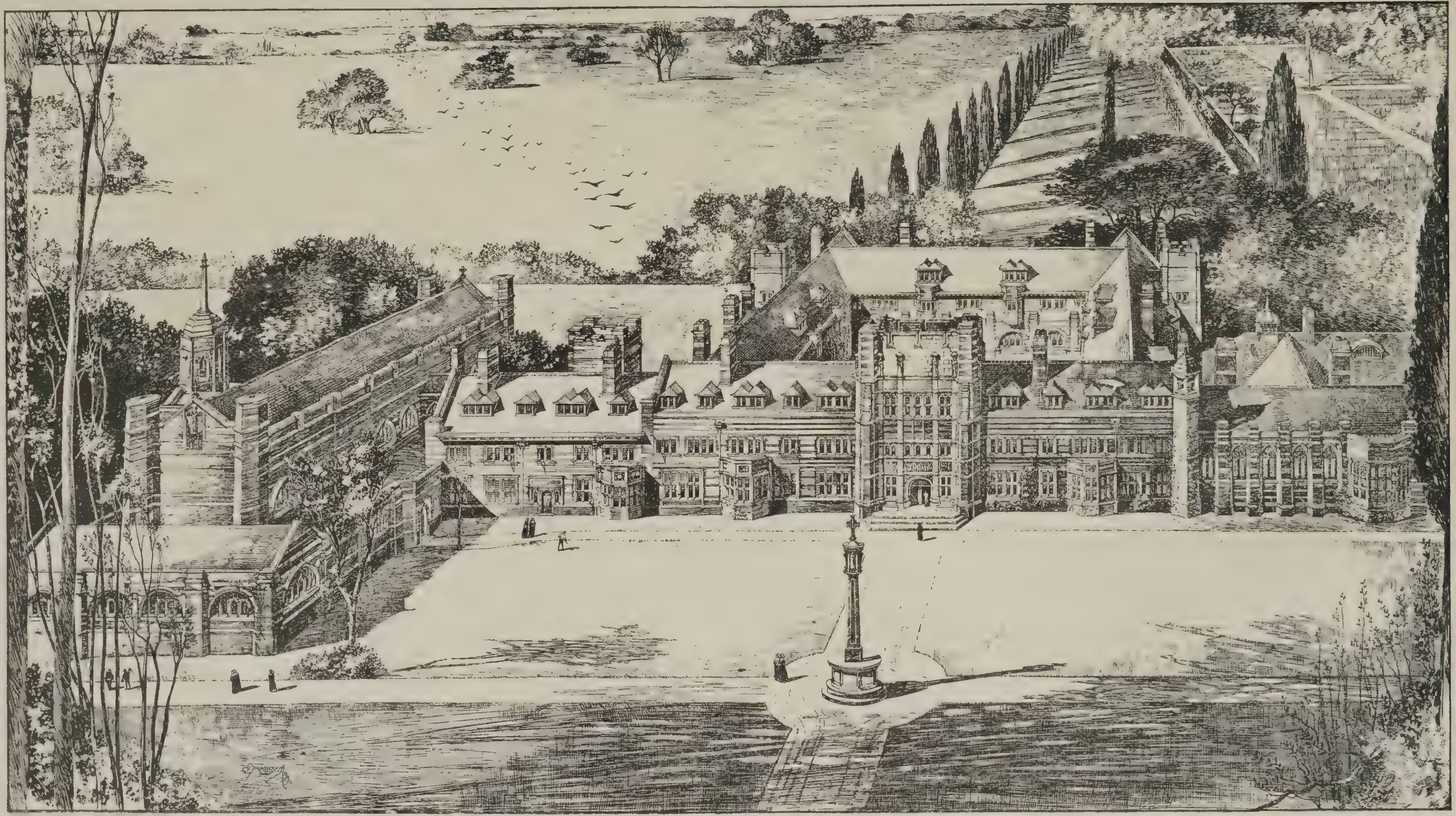

ALL SAINTS' CONVENT, COLNEY CHAPEL, ST. ALBANS. LEONARD STOKES, F.R.I.B.A., Architect.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Payment for Quantities by Contractor.

Cardiff.—H. W. H. writes: "A builder tendered for certain works according to a bill of quantities supplied by the architect, and included the usual 2½ per cent., for quantities, on the amount of the contract. Owing to the tenders exceeding the amount which was intended to be expended, the two builders whose tenders were lowest were asked to re-tender for the work after certain modifications had been made, the said builder being one of the two. In preparing his amended tender, the latter based the 2½ per cent. upon the ultimate amount of the reduced price. His tender was accepted, and the architect now claims the 2½ per cent. on the amount of the first tender, which is, of course, more than was taken for tender No. 2. Can he legally claim this?"

You will have to pay on the amount of the first tender, as the quantity surveyor must be paid for his work, and you have agreed to do so. This is of common occurrence, and you must pay for the experience. We must say, however, that the system is a pernicious one, and unfair to both the quantity surveyor and the contractor.

Cause of Putty Flaking.

Mansfield.—Builder writes: "I built a greenhouse last year, which was glazed in December, and the putty peeled off in flakes this summer. What was the reason?"

We presume the wood was wet or damp when the putty was put on; consequently, it never took a hold, and when it dried it naturally flaked off.

Ascertaining the Distance of an Invisible Object.

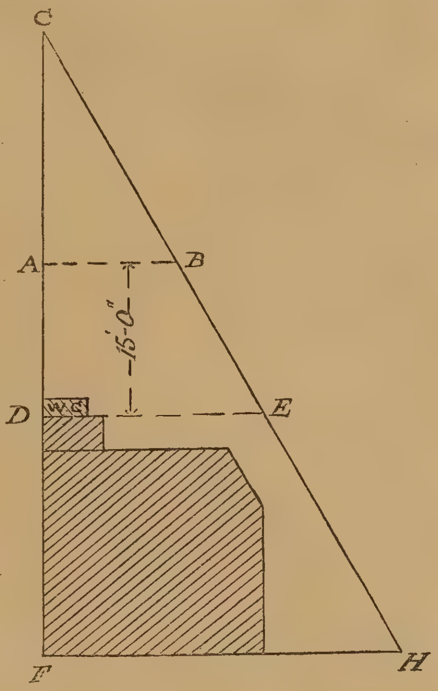
Student writes: "Kindly state in simple language the formula for finding the distance of an invisible object, a base and angles being known. What is the shortest base (consistent with accuracy) that can be taken for distances up to 1,000yds?"

To find the distance of an inaccessible object by calculation requires the use of trigonometry, but it may be found approximately by plotting the base line and angles to any convenient scale. A base of 100yds. should be used for ascertaining the distance of about 1,000yds., unless very accurate instruments are used, when half that base might be sufficient. HENRY ADAMS.

Air-Space around Buildings.

Aberdare.—Cynon writes: "The reply to my enquiry relative to air-space around buildings, on p. 181 of your issue for October 23rd, does not give the desired information. You have evidently taken the boundary wall 18in. thick for a road or passage. The distance from A to C is 15ft., but the surveyor in arriving at his decision squared the building to a point marked B, and said the 15ft. should be measured from this imaginary point, although the by-law says 'from every point of such building,' and further that the 15ft. should be measured to the boundary wall and not over. The boundary wall is entirely on our own property. Now the point is this, has he a right to say we have not caused the 'open space to extend laterally throughout the entire width of such building,' and that the distance across the open space from every part of the building to the boundary of any lands or property immediately opposite or adjoining the site of such building is not 15ft.? He says the annotated by-laws give examples?"

1. The surveyor is quite correct in his interpretation of clause 58 of the local by-laws (which is apparently precisely the same as clause 54 of the Model By-laws) as regards the ordinary method of calculating the air-space, &c., under this particular clause. Taking into consideration the additional information now given, it should, however, be pointed out to the surveyor that if he again refers to the annotated by-laws he will find that the examples he quotes deal with rectangular sites only, or building plots having a width at the rear equal to that of the frontage. In the case of building sites tapering to the rear, it should be borne in mind that the absolute and literal requirements of such a clause as that mentioned, namely, that the "open space shall extend laterally throughout the entire width of such building"—and for the specified distance across—cannot always be complied with. In order to deal with cases of this description, a modification of this Model By-law is therefore provided in clause 54A of the annotated by-laws as follows: "Provided always that in any case where the site of a building may be of such a shape that the width thereof diminishes towards the rear, and it is therefore impossible to provide an open space extending laterally throughout the entire width of such building and having the required distance across such space, the person who shall erect such building shall provide in the rear thereof an open space, the extent of which is to be determined in accordance with the provisions of this by-law, subject to the following exceptions: (1) He shall cause that the distance across such space measured from the rearmost wall of such building to a line at which the lateral width of the open space shall not be less than one-half of the width of such space at such rearmost wall. (2) He shall provide on the side of such line remote from the building a further open space, exclusively belonging to such building, of a superficial area equal to one-third of the area of the space hereinbefore required to be provided. (3) This proviso shall not apply in the case of any building which would form part of a continuous line of buildings enclosing a space in the rear of such buildings whether in the form of a square or in any other form." The accompanying diagram shows the application of this modification of the ordinary by-law to the particular case in question. Under these conditions the length of the line A B (at a distance of 15ft. from the rearmost wall of the proposed building) must be not less than one-half the length of the line D E (which is the prolonged line of the rearmost wall of the building), whilst the area of the open space A B C must be not less than one-third of the open space enclosed within the figure A B E D. At the same time the building may occupy the whole of the area enclosed within the figure D, E, H, F. It is suggested that a revised plan complying with these conditions be submitted to the local authority, and asking that it may be dealt with in the manner described above for building sites of this description. Should the approval of the local authority be withheld, the whole matter might then be placed before the Local Government Board.—2. It is considered that the surveyor is quite justified in declining to include the boundary wall within the measurements of the "open space," &c., required at the rear of the building under this by-law, seeing that the by-law lays down that the "open space" shall be "free from any erection thereon above the level of the ground, except a water-closet, earth-closet or privy, and an ash-pit." Otherwise it might be possible for the whole of the "open space" to be occupied by a boundary wall 10ft. or 15ft. thick, and so rendering this portion of the clause partially or wholly inoperative. T. E. C.



Retaining Heat in Cistern.

Croydon.—E. B. writes: "Which is the best possible method of keeping hot a 300-gallon water cistern for, say, six or seven hours? Some clients of mine who have a great amount of machinery in use for various purposes between 9 and 11 a.m. are obliged to keep a 10 h.p. boiler alight all day in order to afford a means of obtaining hot water to wash up the utensils of a large business in the afternoon. It has been suggested that if any packing could be so arranged around the cistern the water might be boiled in the morning and the fires then allowed to go out."

If this cistern is covered with two thicknesses of ½in. hair-felt it will retain its heat for some hours. If it has a wood-cover, one thickness of felt might be put over the cover. The felt may be kept in place round the cistern by hoop-iron bands, and may be prevented from damage by canvas sewn round outside (see the particulars of tests with slag wool given on p. 272 of this issue). HENRY ADAMS.

Hip to Queen-Post Roof.

Student writes: "Which is the proper way to form a hip at the end of a Queen-post roof?"

The Queen-post truss will presumably have a flat top, and in that case the hipped end will be formed by two partial trusses consisting of principal rafters and tie-beam connected to the nearest whole truss by wrought-iron plates and bolts, and will carry purlins and common rafters as in the remainder of the roof.

HENRY ADAMS.

Action of Sea-Water and Cements on Iron.

London, S.E.—R. N. writes: "I have read that the action of sea-water on cast iron, as in the case of piles, &c., is to convert it into a soft substance which can be cut with a knife. What is the chemical action which causes that condition? Do iron columns embedded in brickwork and cement undergo much deterioration in substance from chemical action? It is suggested that in the course of time a basic silicate may be set up between the cement and iron. Is that so?"

The chemical action of sea-water on iron has not been fully investigated, but it would appear to be similar to ordinary rusting, that is, the carbon dioxide (carbonic acid gas) in the water starting the action, hydrated ferric oxide is formed slowly at first, together with a small proportion of carbonate of iron. After the action has been started it proceeds more rapidly, probably because the iron and hydrated iron oxide exert an electrolytic action on the water. The presence of water and carbon dioxide are necessary to rusting, dry pure air not affecting iron. The emission of hydrogen gas caused by this action disintegrates the close crystalline form of the metal, and the bulk is also increased, causing the flaky condition of iron rust. The deposition of the calcium and magnesium compounds in sea-water with vegetable growths of a slimy nature often make the rust able to be cut with a knife, but when alternately exposed to air and water and allowed to dry the coating becomes extremely hard. The crystalline condition of the iron appears also to have a most important effect upon the rusting. The constituents of a good Portland cement form stable compounds when set, which show no tendency to unite with the iron. In fact, cement is a protection, by keeping moist air away from it. See an answer to an enquiry on p. 521 of our issue for August 7th last.

New Patents.

These patents are open to opposition until December 30th.

1900.—Water and Steam Distribution.—19,318. A. Godfray, Bailiff's Cross, St. Andrew's Parish, Guernsey. Above the boiler is fixed a closed tank which is automatically filled from a cold-water supply tank. This closed tank is connected by pipes with the steam space in the boiler, and there are also pipes to automatically supply hot water up to a certain level in the boiler. By these means the steam circulates through one range of pipes and the hot water through another, so that both are always available for heating or other purposes.

Baths.—20,323. J. Nuttall, 27, Langton Street, and R. Wilson, 19, Gorsey Hill Street; both of Heywood, Lancs. This invention relates to a rising and falling bath intended for use in cottage property, workmen's dwellings, or elsewhere where accommodation is limited. Normally, it lies within a bricked well below the floor, the opening being covered by sliding or hinged doors. From this well the bath can be raised by gearing, suitable arrangements being provided for the supply and discharge of water.

Waste-Valve for Lavatories, Sinks, &c.—20,459. R. G. Howson, Hanley, Staffs. The object of this invention is to avoid a tortuous overflow-passage in the body of the basin. The valve, when closed, allows an overflow through it for maintaining a constant or maximum level, and, when opened, cuts off the air-supply from the valve enclosure, so inducing syphonage and the discharge of the water through the normal outlet.

Drying Bricks, Timber, &c.—21,226. A. E. Brown, 5, Kent Terrace, Regent's Park, N.W. The bricks, tiles, timber, &c., are dried in a tunnel on the direct system of ventilation, in which the air is admitted at a comparatively low temperature at the cooler end of the tunnel, at which end also the wet goods are introduced. The progressive warming of the air is chiefly effected by contact with the cars and goods, which themselves receive heat from radiators above and below them. The essential principle of the invention is that the supply of heat within the tunnel is by radiation and not by convection.

Rainwater-Pipe Wall-Sockets.—23,004. J. Smith, 4, Hampden Street, and R. Walker, 33, Brinkburn Terrace, Stanhope Road; both of South Shields. The socket is made entirely separate from the pipe, so that the latter can be easily renewed; and, moreover, painting is facilitated, as the pipe is not held fast against the wall. The top part of the socket is recessed to receive the end of the upper pipe, and the bottom part is made with an outer and inner sleeve between which the end of the lower pipe is inserted.

1901.—Slag Wool.—16,588. G. A. Herdman, Redcar Iron Works, Redcar. The slag wool is treated with sufficient silicate of soda to give the particles the requisite coherence and is then moulded, the moulds being lined with muslin or scrim, which adheres to the wool and allows it to be freely handled or cut up without fear of disintegration.

The following specifications were published on Saturday last, and are open to opposition until January 6th, 1902. *The name in italics is that of the communicators of the invention. A summary of the more important of them will be given next week.*

1900.—15,426, Gardner, valves for taps. 19,597, Bushman, composition for use as a plaster or artificial stone. 19,758, Webb & Webb, inlaid wood tiles, blocks, &c. 19,980, Bennis & Bennis, refuse-destructors. 20,709, Fletcher, door and window holders. 22,037, Hickinbotham, water-taps. 22,041, Fullerton, metallic pipe-connections for sinks, water-closets, &c. 22,620, Watt, securing doors in different positions. 22,850, Lazerme, valves. 22,909, Pickles, actuating the saw frame in reciprocating wood-sawing machines. 23,212, Corbin, stair treads. 23,745, Mitchell, low-pressure valves.

1901.—25, Adams, filter beds. 385, Pullan & Mann, brick presses. 1,187, Eadie & Tannahill, pipe joints. 3,101, Howett, artificial stone. 4,556, Mundlos, means for placing bands on pulleys. 4,775, Healey, hoisting apparatus. 10,084, Boivie, manufacture of artificial stone. 16,356, Fichet & Heurtey, gas generators. 16,640, Hertwig & Liebaug, manufacture of artificial marble. 17,661, Newton (*New Jersey Wire Cloth Co.*), fireproof walls, partitions, &c. 18,810, Mitchell, appliance for illustrating the construction and operation of a valve.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*To be rich without profusion, simple without barrenness, is the great aim of an architect.*"—Percier.

Our Plates. The new Church of All Hallows, Easton, Bristol, was consecrated recently. The scheme provides for a building capable of accommodating eight hundred worshippers, but this has not yet been completed, the work accomplished including choir, sanctuary, north and south transepts, chapel, and three bays of the nave and aisles. The style is English Gothic of the Decorated period. The walls are faced externally and internally with red pennant stone, Bath stone being used for the dressings, and an open timbered roof has been provided. The chief feature of the church is the apsidal termination of east end, which has an ambulatory around it. There is a fine altar, but the choir stalls have not yet been executed, and the pulpit is a temporary one. The church will be heated by warm air, but the apparatus (by Messrs. Haden & Son, of Trowbridge) is not yet available for use. The contractors for the building are Messrs. R. Wilkins & Sons, of Surrey Street, and the architect is Mr. George H. Oatley, of Edinburgh Chambers, Baldwin Street, Bristol.

New Buildings at Edinburgh Castle. The plans of the new buildings which the War Office authorities propose to erect to the east of the military hospital were recently presented to what might be described as a committee of taste including Lord Provost Steel, Sir George Reid, president of the Royal Scottish Academy; Mr. Morham, the city superintendent; Colonel Kirke, commanding the Royal Engineers in Scotland; and Major Hemming, R.E., from the War Office. The plans were considered wholly from the æsthetic point of view, and so regarded they were approved of generally, subject, it is understood, to certain slight modifications in outward detail. They were also on public exhibition in the City Chambers last week. The plans have been prepared at the War Office, under Major Hemming, R.E., and show a building of the castellated or Scottish baronial style of architecture, providing officers' mess-room accommodation and quarters for seventeen officers and their servants. The new structure, which is 124ft. long and 100ft. deep, is for the most part two storeys in height, but the fall in the ground at the north side is utilised for the kitchen, cellars, offices and servants' quarters, and that part of the building is thereby increased to four storeys. The site is on the Old Mills Mount, to the immediate east of the recently-erected military hospital, and the barracks now occupying the site will be demolished to make way for the new quarters, the design of which is in harmony with the architectural features of the existing buildings. On entering the Castle the new building will be to the right, after passing the Argyle battery. In front of the mess there is a terrace with a stone parapet, and on the north side a spacious flat over the billiard-room commands a view of Princes Street and the Fife coast. The plans were exhibited in elaborate detail, and showed all the sections of the work as well as the completed buildings seen from different points of view, so that one could judge of their effect on the skyline. There were also four sets of photographs showing the buildings as they now exist and as they will appear when the contemplated erection has been carried out, the views being taken from the north side of Princes Street, the foot of the Mound, the Waverley Bridge, and the Calton Hill. The probable cost is estimated at about £20,000.

The Memorial to Sir Joseph Bazalgette. The memorial to the late Sir Joseph William Bazalgette, C.B., which was unveiled on the Victoria Embankment recently by Mr. A. M. Torrance, chairman of the London County Council, is the work of Mr. George Simonds. It occupies a conspicuous position immediately facing Northumberland Avenue, and consists of a mural monument wrought in veined Sicilian marble, containing a portrait-bust in bronze of the late Sir Joseph Bazalgette. The base of the monument, rising from a sub-base of granite, consists of a carved panel embodying in arabesque design the symbols of Science and of Labour, and the central ornament from which these enrichments spring is formed by three dolphins, emblems of the tidal river. This centre panel is flanked by two low pilasters, panelled and decorated with shields, and the whole is surmounted by a heavy moulded cornice. Above this are placed two smaller pilasters, with capitals formed of the bulrush and water iris, flanking the recess in which is placed the bronze portrait-bust. In the recess above the bust hang garlands of laurel leaves, also cast in bronze, while below the bust, and resting on the cornice of the base, is a bronze plaque or label with the following inscription in raised letters: "Sir Joseph Bazalgette, C.B., Engineer of the London Main Drainage Scheme, and of this Embankment. Born 1819. Died 1891." From either side of this label, and filling the space between it and the pilasters, rise bronze branches of oak leaves and acorns. These pilasters are decorated with sunk panels of arabesque formed from the various instruments of the engineer and surveyor. The late Sir Joseph Bazalgette was one of the best known, one of the most respected, and one of the ablest engineers of the City of London. It is fitting that something should be done to perpetuate his memory.

South Wales Architects. The opening meeting the 1901-2 session of the Cardiff, South Wales and Monmouthshire Architects' Society was held on November 15th at Cardiff, when Mr. E. W. M. Corbett, F.S.I., delivered his presidential address. The chair was occupied by Colonel E. M. Bruce-Vaughan, F.R.I.B.A. In the course of his address Mr. Corbett urged upon students the necessity of taking up all branches of surveying and valuing, as well as the purely architectural branches. In order to get on in the provinces an architect required to know engineering construction, sanitary engineering, heating, lighting and ventilation. It was the lot of few to obtain a full knowledge of all those things, and many of them had of necessity to be left to specialists. The president warned the students against indulging too freely in facile designing, which encouraged the straining after effect at the cost of beauty. Designs could be worked out only with great labour, and incessant care should be taken to avoid vulgar and meretricious ornaments, introduced for the sake of originality. They had in Cardiff Castle the product of one of the giants, Mr. Burgess. Nothing was copied in it, and it remained an example of commanding merit for all time. When he (Mr. Corbett) first commenced as an architect Gothic architects had it all their own way—even public-houses had a touch of the Gothic. But their gospel of truth in design and horror of shams had had a lasting effect, and he hoped it would long endure. Speaking of the relations between the architect and his client, he said the best policy was always to be frank. The practice of taking commissions from tradesmen he characterised as absolutely dishonest. The trusted that sort of thing was rare in Cardiff, but it was not unknown. Their duty to their client was to give him the best they could at the lowest price; and could they do that if they accepted commissions or, practically, bribes? He wished the late Lord Russell's Bill had become law, and that the man who accepted a commission was liable to punishment. As regards builders they were fortunately placed in Cardiff. He had carried out about £150,000 worth of work with builders in Cardiff, and he had never yet had any serious dispute, having found them very fair in all dealings.

SOME LAW POINTS FOR ARCHITECTS AND BUILDERS.[*]

BY W. JOHNSON-ROBERTS, Solicitor.

THE subject of my paper is a very large one and I have experienced considerable difficulty in selecting from a huge mass of legal decisions the points I now bring under your notice. I have tried to avoid the better-known propositions, and have confined myself to those which, though less known, are equally important. I thought it would be more satisfactory to select a few points and discuss them with a fair amount of detail than to skim over a much larger area superficially; I have, moreover, tried to select such points as would be most likely to arise in a good general practice, and which are of frequent application, rather than more obscure ones (however interesting) which rarely occur. As the provisions of the various sanitary Acts as to drainage, privies, &c., form a fertile source of litigation, I intend to devote the major portion of my paper to the consideration of that subject. Before doing so, however, I shall say a few words about another matter which very frequently demands your consideration—that is, in the event of the demolition of a building, what are your rights and duties in respect to adjoining owners? These I will now shortly consider.

Support of Adjoining Buildings.

When the building is detached no question of importance is likely to arise save as to light and air, the law of which rather appertains to the new building; but if the building forms part of a terrace, and supports or is supported by buildings on one or both sides, a most important question then arises as to your duty in respect to the owners of the premises the lateral support of which you have withdrawn. The rights and liabilities of the parties under these circumstances I now propose to consider. In a case which was decided in Dublin some years ago these rights and liabilities were fully considered and judicially decided upon. The case to which I refer is *Kempston* v. *Butler* (Ir. C.L. Rep., vol. xii., p. 516). The plaintiff was the owner of the house No. 82, Grafton Street, between which and the house adjoining was a certain party wall which was part and parcel of both houses and upon which the beams and joists of the plaintiff's house rested, and by which party wall the other walls of the plaintiff's house were supported. The plaintiff's house and the party wall had been built more than forty years prior to the acts complained of. This fact is specifically mentioned, as in most cases this lapse of time and uninterrupted user would have given "a prescriptive right" to the continuance of the easement. It was further alleged that the defendant knew that the wall was a party wall. Now the acts complained of were that the defendant, who was a builder, had in taking down the house No. 82 (for the owner) neglected to stay and prop up the party wall securely, by reason of which neglect it fell down, and with it plaintiff's house, which was utterly destroyed. Lord Chief Justice Monahan, in delivering judgment, cited the case of *Peyton* v. *The Mayor of London* (9 B. & Cr. 725), in which it was decided that where two houses adjoined, and where they they had in fact a party wall between them, there was no such obligation cast by the law of England upon the owner of either of the houses as was sought to be thrown on the defendant there, and that either party could take down his own house provided he were guilty of no negligence in doing so; moreover, if it became necessary to shore up the adjoining house, that the duty was cast upon the owner of the adjoining house and not on the owner of the house to be taken down. The learned judge also stated "that the law says that neither party has a right to the support of the adjoining house. A custom (as was alleged) to the contrary would be unreasonable, because it would throw indirectly upon the owner of the house taken down the expense of shoring-up the adjoining house; for if the builder be employed for the purpose of taking down the house to rebuild it, he will not do so unless he be paid by the person employing him the expense of shoring-up the adjoining one." Again, in the same case, Justice Christian stated "that if two persons build a wall at their joint expense on their boundary line with the intention of each adding buildings on his own side, I can understand that each gives the natural support of his land and that he cannot be allowed to dig in his own soil so near as to weaken the foundation of the common wall. But he is not bound to supply *adventitious* supports; and if he does build against the wall, and the new house does come to afford it certain additional support, he may, notwithstanding, take down the house when he pleases; and if he leaves the party wall no worse than when he built the house, the neighbour has no right to complain. Nor can the length of time during which the house may have stood make any difference; for the existence of the support is a thing uncertain and invisible—it may be the house that supports the party wall, or the party wall that supports the house; and therefore no presumption of grant arises from continuance." This rule apparently only applies where the houses were originally built by different proprietors, and in which there is or was no community of interest save the mere common ownership of the partition wall; but if all the houses were originally built by the same person, and they mutually supported each other, and if the owner as owner of all was benefited by that mutual support, then, if he alienated one, he granted with it a share in that benefit—a benefit derived not only from the partition wall, but also from the whole house—and he retained a similar right himself for the houses he kept. This has been decided in *Richards* v. *Rose* (9 Ex. 218).

The Practical Application of the Case.

Having given you a rather full epitome of the case, I think it would be well to consider what it decided and its application. The points decided by this case are shortly these:—

(1) There is no custom in the Dublin building trade whereby a builder would be compelled to shore-up a house adjoining that which he may be demolishing.

(2) If such a custom did exist it would be unreasonable, and therefore illegal.

(3) The owner of the house being demolished is not liable either to shore-up premises adjoining those which he is demolishing, or to damages at the suit of an adjoining owner whose house falls down because it has not been shored-up.

(4) The fact that the wall which fell was a party wall in no way interferes with these conclusions.

(5) And that in cases of this kind mere lapse of time does not give a prescriptive right.

Provided always that there was no negligence in the removal, and that the foundation of the party wall was not interfered with.

The conclusions arrived at apply equally well whether the house has been standing a hundred days or a hundred years. There is, however, a most important limitation to the application of the above dicta, which is, that they only apply in the case where there never has been any other community of interest between the owner of the demolished house and the owner of the adjoining premises other than a community of interest in the ownership of the party wall.

If it can be shown that the house being demolished and the adjoining premises were all originally built and owned by the one person, and that he, as such owner, was benefited by such mutual support; then, as already stated, if he (the owner) sold or otherwise disposed of one of the houses he disposed of a share in the benefit of the support which the house gave the party wall, and reserved a similar benefit to himself, in which case it would be his duty to see that during the process of demolition the adjoining premises received the support to which they were entitled. To put the thing in a nutshell, where the premises being demolished and the adjoining premises were built and owned by one and the same person, who subsequently disposed of a portion of them, the owner of the house being demolished must give the necessary support to the adjoining premises. In any other case, granting him to be guilty of no negligence and not to have disturbed the foundation of the partition wall, he need take no trouble as to shoring-up adjoining premises save for his own safety. It would be well in all cases, however, to give notice to the adjoining owners of his intention to demolish, so that they can take such precautions as may seem fit; and in respect to premises to which the Dublin Corporation Act, 1890, applies such a notice is obligatory and the time and mode of its service are therein specifically set out. This Act is very similar to the English Metropolis Management Act, 1855. I fear I have been a little prolix in my explanation, but as the liabilities of the parties very often depend upon what at first sight may seem trivialities I have sacrificed conciseness to clearness. I trust each of you now will be in a position to determine for yourselves under what circumstances adjoining premises must be shored, and by whom, and to fix the liability in the event of accident.

I have mentioned the Dublin Corporation Act incidentally. Most people believe that under it and the sanitary Acts the Corporation have almost unlimited powers. I may admit that that was my own impression until I investigated the matter for myself. I then found that, with a very few exceptions, such is not the case. I state this specifically, as some think that the case I have been discussing has been materially altered or affected by these Acts.

Party Walls.

The Dublin Corporation Act of 1890, however, contains a few points which it might be well to consider, including a number of enactments and regulations concerning party walls. On careful reading it will be seen that they only define more clearly and amplify the rights of the building-owner and the adjoining owner over the party wall, and in no way touch upon or alter the law as to the building-owner's duty to shore it up, nor do they inflict a penalty for not doing so. They refer solely to the rights of the parties in respect to the wall itself. In certain cases you will see that awards by way of compensation are to be given to or by the building-owner in the event of injury done to it by his act. The injuries to which this refers are fairly well set out, and consist chiefly of cutting away chimney-breasts, footings, jambs, &c. No reference whatever is made to injury caused by the building-owner by the withdrawal of the support of the house being demolished. Of course, I do not advise you in every, or possibly any, case to dispense with such shoring as may be necessary for the safety of your workmen or the protection of your works. I merely desire to point out your rights and duties considered from a strictly legal point of view.

I will now proceed to another branch of my subject. We will suppose that the existing building has been successfully demolished and that the question of shoring or propping has been satisfactorily solved. The next important question which would then present itself to us is the question of the sewerage and sanitary accommodation. The law on these subjects naturally resolves itself into two parts—one, the law as applicable to newly-erected or rebuilt houses; the other, the law as applicable to houses already built. Let us consider the newly-built or rebuilt houses first.

The Sewerage of Newly-Built Houses.

We all know what a newly-built house is, but what exactly constitutes a rebuilt house is not so clear. A house is considered to have been rebuilt within the meaning of the sanitary Acts[*] if it is a building which has been pulled down to or below the ground floor, or any frame building of which only the framework is left down to the ground floor; or the conversion into a dwelling-house of any building not originally constructed for human habitation; or the conversion into more than one dwelling-house of a building constructed as one dwelling-house only—this shall be considered the erection of a new building (and whenever any old building has been taken down to the extent of one-half of such building, such half to be measured in cubic feet, the rebuilding to be considered a new building)* for the purposes of the Act (Public Health Act, Ireland, 1878, section 43). Therefore, for the purposes of this part of the Public Health Act new houses and houses which have been extensively rebuilt are in the same category. Such being the case, let us consider the provisions of the Public Health Act affecting such structures.

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[*] A paper read before the Architectural Association of Ireland on November 5th 1901.

[*] The chief Irish Act is the Public Health Act of 1878; corresponding to the English Public Health Act of 1875, of which it is almost a counterpart. The Public Health Act next in importance is that of 1890, which is applicable to England, Wales and Ireland, exclusive of the administrative county of London.

By section 44 (section 3 of the English Act) it is enacted that "it shall not be lawful to newly erect or rebuild as above defined any building without sufficient water-closet, earth-closet or privy accommodation, and an ashpit covered with proper doors and coverings." I do not believe I am wrong in stating that almost every word of this section has given rise to important litigation. What is "a building"? What is "sufficient water-closet, earth-closet or privy accommodation"? Who is to be the judge of its sufficiency? Is there any appeal from his decision? Has the owner of the house being erected the option of selecting the form of sanitary convenience he proposes to adopt, or must he follow the dictates of the judge of the sufficiency? All these questions are of the utmost importance, and I will now consider them separately.

Legal Definition of a "Building."

Let us start at the first. What is "a building" within the meaning of the Act? As no definition of this word is given in the Act, it might be well to consider a few kinds of structures which have been held to be buildings. I shall merely give a few of the principal decisions affecting this point. In England a dissenting chapel has been held to be a house capable of human habitation, but a church consecrated by law to ecclesiastical purposes for ever is not (*Wright* v. *Ingle*, 16 Q.B.D. 379; *Caiger* v. *Vestry of St. Mary, Islington*, 50 L.J.M.C. 59; *Angell* v. *Vestry of Paddington*, L.R. 3 Q.B. 714). For the purpose of the Nuisance section of the Public Health Act a ship is a house (section 126, which is section 110 of the English Act).

However, temporary structures of bricks and mortar used for the storage of tools during the erection of some cottages were held not to be buildings within the meaning of a by-law which required plans of intended structures to be deposited, and the by-law was declared bad (*Fielding* v. *Rhyl Improvement Commissioners*, 3 C.P.D. 272). Arches under a roadway in certain cases have been held to be buildings (*Thompson* v. *Sunderland Gas Co.*, 2 Ex. Div. 429).

Sufficiency of Sanitary Accommodation.

Now as to the sufficiency of the sanitary accommodation to be provided. Under section 44 of the Public Health Act, 1878—which is section 35 of the English Act, and which applies to newly-built and rebuilt houses—it appears that the sanitary authorities are the proper judges. An appeal lies from their decision to the Local Government Board so far the law as to *newly built* or *rebuilt* buildings is concerned.

I will now consider our rights and the law respecting *already existing* dwellings with regard to the questions already discussed. The judges of the sufficiency of existing sanitary accommodation under this section (section 45—36 of the English Act)—are again the sanitary authorities. They are the sole judges subject to appeal. The only appeal for practical purposes in proceedings under this section is to the Local Government Board, who have the power of revising the decision of the sanitary authorities. An appeal also lies from their decision to the Court of Quarter Sessions (in Dublin quarter session district to the Recorder), thence to the King's Bench on special case, then to the Court of Appeal, and ultimately, if so desired, to the House of Lords. But it would have to be on some other question than the "sufficiency" of the sanitary accommodation; it is, therefore, of little use. Proceedings are, however, very rarely taken in this country under this section (36 of the English Act, 45 of the Irish Act of 1878) because the justice is not empowered to inflict any penalty for non-compliance with his order, as he can do under section 44 (35 of the English Act). What the sanitary authorities have to do in the event of non-compliance with an order under this section is to do the work themselves and sue the owner for the cost as private improvement expenses, or recover it under the Summary Jurisdiction Acts. As this necessitates an immediate expenditure, to be followed by a more or less problematic return, and possibly by a loss to the sanitary authority in the event of the owner's appeal to the Local Government Board being successful, it is rarely resorted to. Moreover, the Local Government Board's opinion on the sufficiency of the sanitary accommodation cannot be had until the sanitary authorities have expended their money. Therefore questions as to the rectification or insufficiency of sanitary conveniences in existing dwellings or buildings are generally determined by proceedings under section 107 (91 of the English Act)—the Nuisance section. In this event the justice (represented in the Dublin Metropolitan Police District by the police magistrate) becomes the judge of the sufficiency of the existing arrangements. He has absolute power and discretion, with or without the approval of the sanitary authorities, to direct whatever is necessary to abate the nuisance; and, in the words of the learned judge in *Whitaker* v. *Derby Urban Sanitary Authorities* (55 L.J.M.C. 8), "the justices are absolutely unfettered in their judgment." A right of appeal exists both to the Local Government Board and to the Superior Courts.

Owner's Right of Selection.

We now come to consider an important limitation on the discretion of the justices, which is, the right of the owner to select the form of sanitary convenience he will adopt. Popular opinion has it (at least in the city of Dublin) that if the sanitary authorities insist upon having a water-closet, a water-closet they must have. This is entirely wrong. The owner can, if he so desires, put in privies in a new building in Merrion Square or Grafton Street, and, according to the highest legal authorities, there is no law in the land to prevent him doing so. Whatever may be the opinion of your profession as to the respective merits of the water-closet, earth-closet and privy methods of sanitation, we all, I think, agree that the water-closet hobby has been ridden to death in this city. From a layman's point of view, and as one who owns considerable property in the city and suburbs, I must say that a water-borne system of sewerage, especially when associated with fragile and easily disarranged mechanical contrivances, is eminently unsuited to the vast majority of the poorer class of cottages and tenement houses in Dublin. Yet, year after year, the justices have, at the request of the sanitary authorities, compelled this form of sanitary convenience to be used to the exclusion of all others. In a very recent case which was heard before the metropolitan justices, in which I appeared for the owner, this very question arose.* The Pembroke Urban District Council, who were the plaintiffs, summoned the owner because (*inter alia*) he refused to substitute water-closets for privies in certain small cottages in Shaw's Lane, Bath Avenue. The magistrates stated that it had been the invariable practice of the court to make the order demanded, yet on the authority of some recent cases which I cited they refused to do so then. The privies therefore remain unchanged to the present moment. As this view of the law may be novel to some, I think it will do no harm to read a few extracts from the leading decisions on the point. The case of *Whitaker* v. *Derby Urban Sanitary Authorities* (55 L.J.M.C. 8) decides that even under section 45 (section 36 of the English Act), which vests absolute discretion on the sanitary authorities, that notice to put in a particular kind of closet, *e.g.*, a water-closet—without giving the owner the statutable option of a water-closet, earth-closet or privy—is bad. Moreover, section 46 of the Public Health Act (section 37 of the English Act) says that "any enactment in force within the district of any sanitary authority requiring the construction of a water-closet *shall* be deemed to be satisfied by the construction, with the approval of the sanitary authority, of an earth-closet." An earth-closet is there defined to include "any place for the reception and deodorisation of fæcal matter constructed to the satisfaction of the sanitary authority." That the sanitary authorities cannot arbitrarily withhold their approval from any and every form of earth-closet has been repeatedly decided. The mere fact that they have a system of water-borne excreta-removal is no reason why an owner should not adopt an earth system if he so desires. In the important case of *Barnett* v. *Laskey* (68 Q.B., L.J. 55, 1899; 79 L.T. 408), which was decided about a year and a half ago, it was stated that "the use of the privy system is nowhere condemned." If any conjunction of circumstances would have warranted a sanitary body insisting on the substitution of water-closets for privies, this was the one. In this case certain privies and ashpits became infested with typhoid germs, which penetrated into the walls and brickwork of the structures. Several ineffectual attempts were made by the sanitary authorities to destroy them, and ultimately proceedings were taken against the owner under the section of the English Public Health Act (section 91) corresponding with the Nuisance section of the Irish Act. Moreover, it was alleged that the fact of the floors and walls not being concreted constituted *a structural defect* within the meaning of section 110 (section 94 of the English Act). The Lord Chief Justice (Lord Russell of Killowen), in delivering judgment, said: "Counsel for the respondent (the sanitary authorities) said they (the privies and ashpits) ought to have been concreted, but there is no evidence that this is usual or would have prevented the penetration of these germs; on the contrary, it appears that in time they would get even through concrete. Therefore the absence of concrete floors and walls is not a structural defect in privies within the meaning of section 94 of the Public Health Act (section 110 of the Irish Public Health Act of 1878). *The Legislature has nowhere condemned the use of the privy system.*" And in the report of the same case in the "Law Times," at p. 411, the following additional remarks of the Lord Chief Justice appear in answer to the question, What is a structural defect?: "It is said that they (the privies and ashpits) ought to be concreted. But is that usual in such places as these; and even if they were concreted would that be of any avail, for it is stated in the case as a fact that these creatures (the bacteria) can in time penetrate porcelain. The Legislature has nowhere condemned the privy system." Justice Wills, in concurring, said: "In other words it is argued that they (the nuisances) arose from the privy system being in use, not the water-closet system. *I entirely agree with the Lord Chief Justice that it is not fair to throw upon the owners of property the change from the privy system to the water-closet system without any expression on that behalf by the Legislature.*"

Nuisances.

Before leaving this part of my subject it might be well to mention two matters which are more or less directly connected with what we have been discussing. One is, in the event of the adoption of an earth-closet or privy system in premises which have no back exit, and in which consequently the excreta, &c., would have to be emptied through the house, would that fact constitute a nuisance and prevent the owner from exercising his option? In my opinion it would not, for the following reasons: In the first place (although the point has never been actually decided), it seems pretty clear that the removal of excreta in that way would not be a nuisance under any of the sub-sections of section 110 of the Public Health Act, 1878 (section 91 of the English Act, 1875). In this connection I will read you a few extracts from a recent Irish case—that of the *Great Northern Railway Company* v. *The Lurgan Commissioners* (2 Ir. Reports, Q.B., 1897, p. 340). It was an appeal from a judgment given in favour of the sanitary authorities under the following circumstances:—The Great Northern Railway Company, as common carriers, had to carry large quantities of manure consigned to various farmers along their line. Such a consignment was made to Dundalk. The Great Northern Railway Company's station is almost in the centre of that town, and, consequently, when large consignments of manure arrived and (as they frequently did) lay there uncalled for

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* English Public Health Act, 1875, section 159. The section does not contain the part in brackets, which is in the Irish Act only.

* *Pembroke Urban District Council* v. *Whitty*. This case is not reported in the law reports, but a very accurate and exhaustive report of it appears in the "Irish Builder" for June 6th, 1901.

for days or possibly weeks, the result was very unpleasant for the inhabitants. The local justices, as I before stated, held this to be a nuisance. On appeal they were held to be wrong. Justice Holmes said: "All through the Act 'nuisance' appears in conjunction with the alternative 'injurious to health' and 'a nuisance or injurious to health,' and would seem to apply to something of a *permanent* character. Take the case of a trader rolling barrels into his stores, a case that has given rise to a great deal of litigation in England. Can it be suggested that section 107 (the Nuisance section)—section 91 of the English Act—was intended to apply to such a matter at all? Take any of the sub-sections of section 107. There is an idea of permanence running through them all. There is sub-section B, 'any animal so *kept* as to be a nuisance or injurious to health.' Take sub-section C, 'any factory, &c., not *kept* in a cleanly state.' I do not say, or mean to say, that there should not be legislation on these matters, or that penalties should only be imposed on nuisances that are in some measure permanent; but we must look to the scope of this Act, which is to enable the sanitary authority to keep the district in a sanitary state." Justice Johnson added, "The illustrations in the schedule forms also point to something of a permanent nature"; Justice Holmes adding, "The delivery of coal might equally, it would seem, amount to a nuisance within the subsection if this is." Now, what we learn from the decision is that any act or thing alleged to be a nuisance must be more or less of a permanent nature. A mere temporary act would not constitute a nuisance under this section of the Public Health Act, even although it were so undeniably if it were permanent, and even though it might be a nuisance at common law. We all know that there are at present numbers of first-class houses in Dublin the refuse from which has always to be brought through the house for removal. If removing the refuse in this way constitutes a nuisance, these houses should be shut up as unfit for human habitation.

The Drainage Question.

We will now suppose that the method of refuse-disposal has been got over as satisfactorily as our previous difficulties, and that we now have to face the drainage question—for there must be drainage of some sort, if for no other purpose than for removing the surface water. As my paper deals chiefly with cases under the Public Health Act and the Dublin Corporation Act (53 & 54 Vict., c. ccxlvi.). I think it would be well to get a clear idea of the meaning of the words "drain" and "sewer" under these Acts before proceeding further. You can see for yourselves, by reference to the Interpretation section of the Dublin Corporation Act (section 5), that "lands," "premises," "owner," "street," "house," "drain" and "sewer" shall have the meanings assigned to them respectively by the Public Health Act, 1878. The effect of this enactment is to make all decisions under the Public Health Act on these words applicable to the Dublin Corporation Act. Under the Definition section of the Public Health Act (section 2 of Irish Act, 1875; section 4 of English Act, 1878) a drain is defined to be "any drain of and used for the drainage of one building only, or of premises within the same curtilage and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed." A "sewer" is defined as including "sewers and drains of every description, except drains to which the word drain interpreted as aforesaid applies, and except drains vested in or under the control of any authority not being a sanitary authority under this Act."

To take a simple case, if the drain you put in receives the drainage of one building only or of premises within the same curtilage, of course it is a "drain" within the meaning of the Act. If it receives the drainage of more than one building or of premises other than those within its own curtilage, it becomes a "sewer." (Curtilage practically means the building with its yard and out-offices.) Now the rights and responsibilities of the owners of premises which are drained by sewers, and the rights of owners whose premises are drained by drains, are vastly different and each very important. It may be well here to point out what constitutes a "drain": Firstly, it must be the drain of a building or premises within the same curtilage; secondly, it must be used for the drainage of the building or premises within its curtilage; thirdly, it must be made merely for the purpose of communicating therefrom with a cesspool or similar receptacle for drainage or a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed. Every other description of drain or sewer is a "sewer" within the meaning of the Act. There is a general but mistaken impression that to make a "drain" a "sewer" within the meaning of this section of the Act they must all belong to the one owner. This is not at all necessary. They may belong to one owner or to several owners. In considering whether a certain conduit is a "drain" or a "sewer" under the Public Health Act of 1878, the question of ownership does not arise. If it empties into a sewer conveying the drainage of two or more buildings occupied by different persons, and complies with the other requisites above set out, it is a "drain"; and if it drains more than two buildings it becomes a "sewer."

"Private Drains."

Let us now consider the effect of section 19 of the Public Health Act of 1890. In this section we meet for the first time a new form of drain, which is therein described as a "private drain." There is no interpretation of this term in the Act. These words would seem to be used in opposition to the words "public sewer" used immediately previous to them in the same sentence. As far as can be gathered from the wording of this section, "private drain" is equivalent to the word "drain" as interpreted in the Public Health Act of 1878. For the purposes of this section (section 19), *and for these purposes only*, the word "drain" is given an extended meaning, and is made to include a "drain" used for the drainage of more than one building. Moreover, this amplified interpretation of the word "drain" is only allowable in the event of the houses drained belonging to *different owners*, and when the proceedings in relation to the drain are taken under section 51 of the Public Health Act of 1878 (section 41 of the English Public Health Act of 1875). Except when the premises belong to different owners and the proceedings are taken under the section above mentioned. the interpretation of the word "drain" remains unaltered. Under the section last referred to, the sanitary authorities, on the written application of any person to them that any drains, water-closets, &c., are a nuisance or injurious to health, but not otherwise, may examine the same and execute or compel the execution of whatever works they deem to be necessary, and recover the expenses as under section 45 (section 36 of the English Act). The magistrate cannot entertain the question as to whether the works were necessary or not, the only way to raise this question being by appeal to the Local Government Board under section 268 (section 268 of the English Act). Considerable doubt exists as to whether or not this section is retrospective, conflicting decisions existing on the point. This section applies to the drains of "houses." Section 2 of the Act of 1878 (section 4 of the English Act of 1878) refers in the heading "drain" to the drains of "buildings or premises." What (if any) the effect of this difference in the wording is, remains to be seen. Another awkward point in connection with this section is that the expenses shall be assessed in such shares as shall be settled by the "surveyor" of the sanitary authorities. Further, in section 11 of the Act of 1890 "surveyor" is declared to have the same meaning as under the Public Health Act of 1878. Now, under that Act we have no interpretation whatever of the word "surveyor," and who that gentleman is we have yet to learn judicially. I think I have said enough to convince you of the correctness of Lord Russell of Killowen's statement that the legislation on this subject is in a very unsystematic and chaotic condition.

Section 60 of the Dublin Corporation Act enacts "that where any dwelling-house *in the city* is drained only by a brick or built drain the house shall be deemed to be without a drain sufficient for effectual drainage within the meaning of section 25 of the Public Health Act, and that section shall be construed and have effect accordingly." The twenty-fifth section of the Public Health Act above referred to deals with the power of the sanitary authorities to enforce the drainage of undrained houses. Under the Public Health Act, 1878, section 25 (section 23 of the English Act) the owner can only be compelled to put in "covered drains," the requirements of which section would be complied with by a brick drain. Now, however, in the city of Dublin brick drains can no longer be used.

Drains and Sewers.

Let us now resume our consideration of the distinction between a drain and a sewer. A drain is, as we know, a drain used for the drainage of one building or premises within the same curtilage; a sewer is any other kind of a drain. Now, under section 15 of the Public Health Act, 1878 (section 13 of English Act), "all existing and future sewers within the district of a sanitary authority, together with all buildings, works, materials, and things belonging thereto, shall (with the exceptions therein set out) vest in and be under the control of the sanitary authority," and section 17 (section 15 in the English Public Health Act) makes the "sanitary authority keep in repair all sewers belonging to them."

This means that the sanitary authorities are responsible for the upkeep of any "private drain" which has by reason of its draining more than one building become a "sewer," and that whenever it goes out of order they must put it into a proper state of repair at their own expense. Of course this is a very satisfactory state of things for the owner, but possibly not quite so satisfactory for the sanitary authorities. Now, whenever a drain receives the drainage of more than one house, from the point when the sewage of the second house enters it it becomes a sewer, and as such vests in the sanitary authorities. Whether it runs under your drawing-room or under your garden, whether it pursues its course along the public thoroughfare or through private ways, matters not; if it carries the drainage of more than one house it becomes a sewer. This was decided in the well-known case of *Travis* v. *Uttley* (1894, 1 Q.B. 233), in which Justice Wright, in delivering judgment upon this very distinction between a "drain" and a "sewer," said: "To hold that what is really a private drain vests as a sewer in a local authority is to hold that a local authority can take away part of a man's land in order to perform its functions, and is also liable for the cost of keeping private property in repair—two apparent absurdities; but the words of the section are plain, and the results may possibly have been intended in order to avoid dealing with the complex right of several houses to use the same drain. No limitation of the definition of the word 'drain' seems possible. It cannot be said to apply to a drain which is part of a house, for a drain like this may run under a long row of houses not held by the same person nor under one title; or to apply only to drains which run through land dedicated to public uses, because in many towns the main sewers run under public houses or buildings, and they clearly ought not for this reason be taken out of the control of the local authority." By Justice Wills: "This drain is used for the drainage of more than one building. It is therefore a sewer." Now, in order to be either a "drain" or a "sewer" the conduit must be used for drainage. This brings us to the question,

What is Drainage?

Within the meaning of the sanitary Acts "drainage" and "sewage" are almost synonymous terms. The common idea that a conduit to be a drain must carry sewage is absolutely erroneous. Any conduit, even though it conveys uncontaminated rainwater or surface-water only, is a drain within the meaning of the sanitary Acts. To quote the words of Lord Justice Smith in *Ferrand* v. *Hallas Land Building Co.* (L.R., 1893, 2 Q.B., p. 144), "A sewer need not necessarily convey sewage matter in order to constitute it a sewer. It would be none the less a sewer within the Act of 1875 (the English Public Health Act, if it conveyed only rain- or surface-water. The draining-off of rain- or surface-water collected from different premises by different feeders into one main drain would

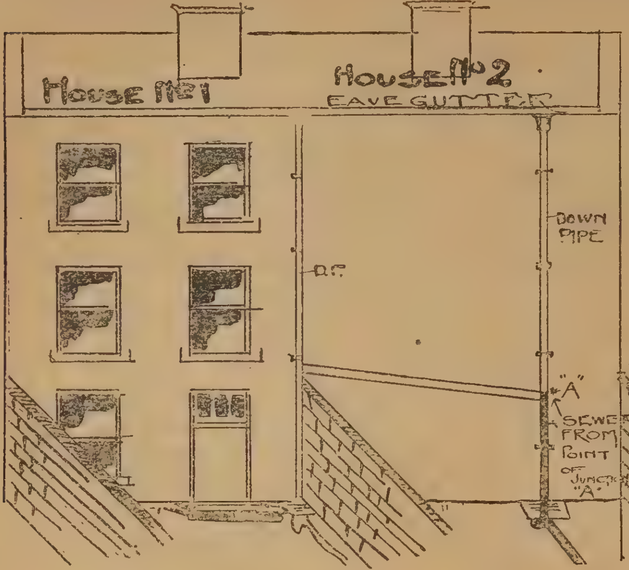

FIG. 1.

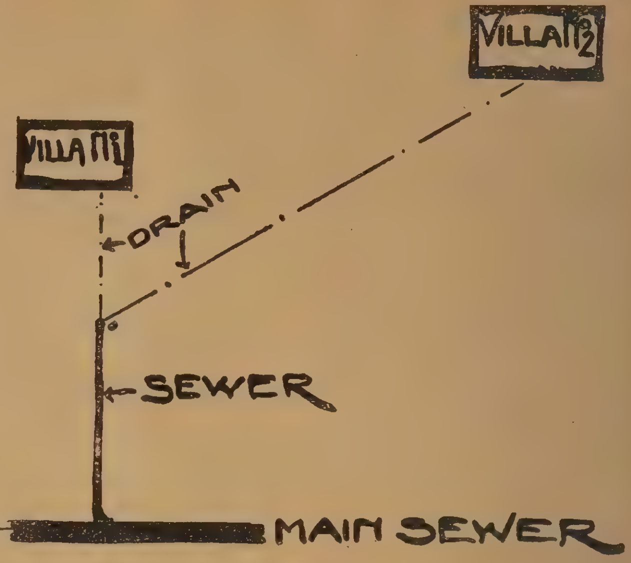

FIG. 2.

constitute that main drain a sewer within the meaning of the Act." To have consistently decided otherwise would seem impossible. To have limited the application of the words "drain" and "sewer" to conduits carrying sewage matter only would have rendered nugatory a large portion of the Public Health Acts by creating a species of conduit which, although *de facto* a drain, and possibly untrapped, badly-constructed and communicating with the main or public sewer, would yet be absolutely free from the operation of the sanitary Acts. Moreover, such an interpretation—or rather limitation—of the meaning of the word "drainage" would be absolutely at variance with its plain meaning. When we speak of the drainage of premises we include in the term the water from the roof, the surface-water from the yard, and the liquid refuse from the house. Now, as I have already told you, it has been decided that the purest rainwater is as much sewage as the filthiest refuse from a closet, and that the conduit carrying either or both of these things is a drain or a sewer, as the case may be.

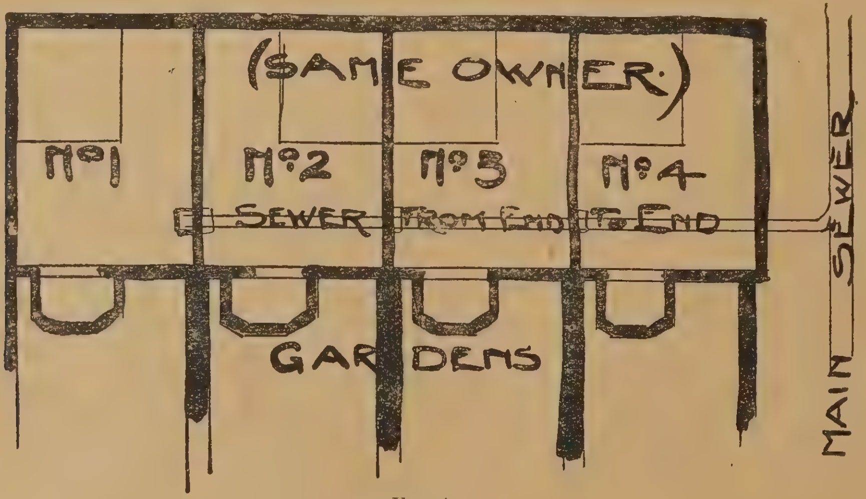

FIG. 4.

I will point out to you the far-reaching effect of this decision shortly, but before doing so I will say a few more words about what a drain must be, or rather what it need not be. Under section 25 of the Public Health Act of 1878 (section 23 of the English Act), which, however, applies *only* to undrained or insufficiently-drained houses already existing, and under section 27, which gives urban authorities similar powers over newly-erected or rebuilt houses in their district, the sanitary authorities have power to regulate the size, shape and location of the drains of a house. It is most important, however, to bear in mind that once a house has sufficient drainage to the satisfaction of the sanitary authorities, and so long as no nuisance or state of things injurious to health exists, the sanitary authorities have no power whatever to prevent the owner making any number of supplemental drains he may like, or placing them anywhere he wishes. There is also a provision in the Dublin Corporation Act (section 60) enabling the metropolitan sanitary authorities to require new pipe-drainage for premises which are only drained by a brick or built drain. That is, however, only a minor point. I want you to remember, first, that it is settled law that a conduit carrying rainwater only is a drain within the meaning of the Public Health Acts; and secondly, that with the exceptions I have mentioned you may have your drain anywhere and of any materials. By this time some of you will probably be thinking if that be so the gutters on your roof or the down pipes may be drains or possibly even sewers. That is a perfectly logical and, in my opinion, a perfectly correct inference. The Public Health Act enables the sanitary authorities to proceed under sections 25 and 27 only in the event of the premises being without sufficiently effectual drainage. Once there is sufficient and effectual drainage the powers of the sanitary authorities are at an end.

We will presume that such drainage exists. Consequently, as above stated, the owner can now put in as many additional drains as he thinks fit. The additional drainage he indulges in is usually confined to small drains, draining the surface-water from the yard or garden, and the rainwater from the roof of the house and out-offices. The latter drains, though they be but gutters and down pipes, are none the less "drains" within the meaning of the Public Health Act. If there were a dozen of these, all emptying into the one main drain, the latter would still be a drain, provided all the premises drained were within the same curtilage; but let the rainwater from an adjoining house or the surface-water from an adjoining yard be emptied into one of our drains, then, behold, the latter becomes a sewer from the point of junction. This is equally true whether the drain be from a water-closet and runs 6ft. under the ground, or whether it be a drain in the shape of an eaves-gutter draining the rainwater from the roof 60ft. above the ground; from the point where it receives the drainage of more than one house it becomes a sewer. Thus arises the extraordinary fact that the very gutters on our roof and the down pipes on our walls may be public sewers. A case was decided only last year in which the more weighty and only doubtful part of this proposition received judicial approval. I refer to the case of *Holland* v. *Lazarus* (L.J., 1897, N.S., vol. 66, Q.B., p. 286). There Mr. Justice Bruce held that a rainwater pipe was a drain for the drainage of a building within the meaning of section 250 of the Metropolis Management Act, and that the fact of it being connected (even without the knowledge or permission of the sanitary authorities) with a drain which drained an adjoining house turned the latter drain into a sewer. Now we know by the Definition section of the Public Health Act that any drain which drains more than one building becomes a sewer. We know also that sewers vest in the sanitary authorities. *Holland* v. *Lazarus* practically decides that a down pipe is a drain within the meaning of the Public Health Act. By the same reasoning one arrives at the inevitable conclusion that every gutter and down pipe used for the drainage of a building is a drain; therefore, if we regard them as drains—which we must—the decision in *Travis* v. *Uttley* brings us a step further, and says that when a drain receives the drainage of more than

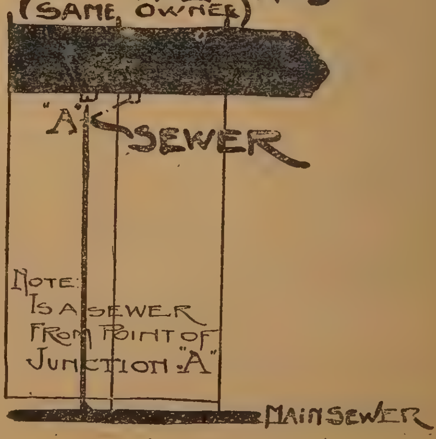

FIG. 3.

one building it becomes a sewer, and as such vests in the sanitary authorities. That is what may actually happen to our gutters or down pipes. This may seem an astounding proposition, but if you consider it carefully you will find that it is only the logical outcome of these decisions and the law on the subject.

I will now refer to the accompanying diagrams. Fig. 1 shows two houses which, for the sake of illustration, we will suppose have no sewer, drains, &c., in such a state as to be a nuisance or injurious to health. That being so, it is immaterial to us whether the houses be owned by the same owner or by different owners. As is seen, each has a separate set of eaves-gutters and down pipes emptying into a gulley in the yard connected with a drain. Our handyman comes along and by merely connecting the two down pipes he turns the one which receives the drainage of the second house into a sewer, from the point where the connection is made. The same result would have been achieved if he abolished one of the down pipes and let the one set of eaves-gutters and the remaining down pipe drain the roofs of the two houses. In that case the entire down pipe and the portion of the eaves-gutter which carried the drainage of more than the one house would have become sewers. Of course if they belong to different owners, in the event of a nuisance arising and proceedings being taken under section 51 of the Irish Public Health Act (section 19 of the Public Health Act of 1890) this will, for the purposes of that section, only cause them to be regarded as a "private drain," and will enable the sanitary authorities to sue for works executed on them.

Fig. 2 shows us two villas served by the one drain, in which the drain from the point of junction becomes a sewer, and which, although it runs through private grounds, is yet a sewer, maintainable by the sanitary authorities.

Fig. 3 shows a very usual way by which a drain may become a sewer. The drain of No. 2 has become choked, and the inevitable handyman connects it just between the stoppage and the house with that of No. 1, thereby converting the latter drain into a sewer from the point of junction.

Fig 4 shows the same principle applies even though the drain runs under the drawing-room.

Figs. 5, 6 and 7 show the effect of ownership on this question when considered in connection with section 19 of the Act of 1890. Fig. 5 shows an undoubted drain; Figs. 6 and 7 show an identical system of drainage which in one case (Fig. 6) by the operation of and for the purposes of section 19 only, by reason of the houses being owned by different owners, remains a drain, while for all other purposes it is a sewer. Fig. 7 shows that for all purposes the drain of the second house becomes a sewer from the point where it receives the sewage of more than one house, because the two houses are owned by the same person.

Fig. 8 is a further example of the principle shown in Fig. 1.

Some Practical Advice.

I have almost reached the limits of my paper, and will now give you a few words of practical advice and a short *résumé* of what I have said.

When demolishing buildings, provided you have not been guilty of negligence and do not undermine the foundations, of the party or division wall or unnecessarily injure it, and provided that the adjoining houses were not built and owned by the same person, you are not bound (save only for your own safety or that of your employées) to shore-up adjoining structures; and if same fall in the course of your operations, you are not responsible for the result. In building operations in the city of Dublin it is necessary to serve the notice required by the Dublin Corporation Act in addition.

As to the kind of sanitary accommodation you will adopt, as I have showed, you can, with the exceptions pointed out, have a water-closet, privy or earth-closet, as you desire. The sanitary authorities of any urban or rural district may compel any existing house to be sufficiently drained. There is another point in connection with drains and sewers which it is well to remember, that the sanitary authorities cannot compel an owner or occupier of premises within their district to employ their workman to make the necessary connection between his drain and their sewer. The owner has a perfect right to do this himself and by his own workmen; the sanitary authorities may, however, direct the mode in which the work is to be done, and may even appoint a superintendent, but beyond this they cannot go (see section 23 – section 21 of the English Act, 1875).

There is yet another little point to which I will refer, because it is so little known and of such general utility. It is that in all the proceedings under the Nuisance section of the Public Health Acts, where the magistrates order a nuisance to be abated within a certain number of days the time allowed does not run until the service of a copy of the order on the person against whom it is made. The usual impression is that, when the magistrate gives (say) fourteen days to execute certain works, the time runs from the date of his order. This is not so. The time runs from the date of the service of the order.

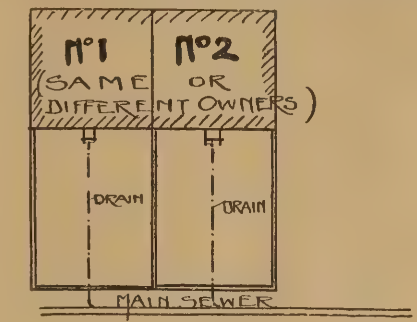

FIG 5.

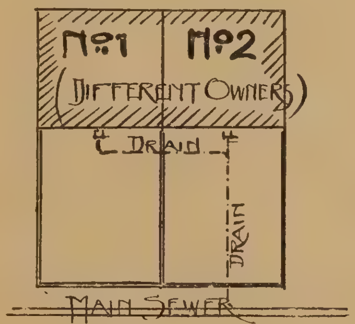

FIG. 6.

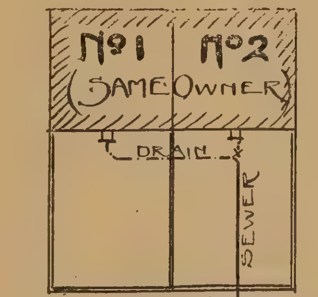

FIG. 7.

To revert again for a moment to the drain and sewer questions, it may be in the experience of some of you that the important connection which makes one drain drain two houses and thereby turns it into a sewer was made surreptitiously and without the knowledge and consent of the sanitary authorities. This frequently occurs, but does not alter the law of the case in the slightest degree. This very point was decided in the case of *Kershaw* v. *Taylor* (1895, L.R 2 Q.B. 208, 471). In that case the builder had erected four houses the drainage of all of which he had carried into the sewer in the road by means of a single drain, contrary to the plan submitted by him to the sanitary authority and sanctioned by them. He subsequently sold the houses to different purchasers. In a proceeding to compel the purchaser of the premises in which the drain which so received the drainage of the four houses was situate to repair it for the purpose of remedying a nuisance caused by its defective condition it was held by Justices Wright and Kennedy that this "drain" was a "sewer" and not a "drain"; that the purchaser was not estopped by the wrongful act of his predecessor in title from alleging that it was a "sewer," and that the duty of repairing it consequently lay not on him but on the sanitary authority. Lord Justice Kaye said: "An attempt is made to get behind this conclusion by saying that the houses have been drained without the knowledge of the local authority, who ought therefore to be entitled to say that the drainage is not by a sewer but by a drain. The question, however, is *rebus sic stantibus*—is this a drain or a sewer? And want of knowledge on the part of the local authority is no answer to the assertion of the respondent that he is not liable for anything but a drain. The conversion of what would have been a drain into a sewer was not by any act of the respondent, and there is no estoppel against him." The decision in this case was followed in several other important cases. Amongst them was the case of *Florence* v. *Paddington Vestry* (12. T.L.R. 30). In this case the defendants had given the plaintiff notice to repair a defective drain. On opening up the ground he discovered for the first time that premises belonging to another owner were drained through this drain, and the connection had been made unlawfully without the consent of the plaintiff or his predecessors in title. Mr. Justice Chitty declared that he was entitled to a declaration that the drain was a sewer, and to be repaid by the defendants the money he had expended in repairing it. It may seem to some that if the law as I have shown it to be were strictly enforced sanitary authorities would be involved in enormous expenditure, especially on the question of "drain" or "sewer" as applied to eaves-gutters, &c. This in no way influences the decision of the courts on the points of law which may arise before them. They decide the cases according to the law, however unpleasant may be the results for private individuals or corporations. In this connection I cannot do better than give you an extract from a case in which this was very clearly set out. I refer to the case of the *Attorney-General* v. *Town Council of Birmingham* (4 K. and J. 528, 6 W., R. 811). An injunction was granted to restrain the defendants from carrying out their drainage operations. On defendants' behalf it was alleged that if the drains were stopped all the sewers of the town would overflow, and that Birmingham would be converted into one vast cesspool. Per Wood, V.C.—"It has been urged upon me more than once during the argument by the counsel for the defendants that there are 250,000 inhabitants in Birmingham, and that this circumstance must be taken into consideration in determining the question of the plaintiff's rights to an injunction. . . . . In the case of an individual claiming certain private rights, and seeking to have those rights protected against an infraction of the law, the question is simply whether he has those rights, and, if so, the court, looking to the precedents by which it must be governed in the exercise of its judicial discretion, can interfere to protect them. Now, with regard to the question of the plaintiff's right to an injunction, it appears to me that so far as this court is concerned it is a matter of almost absolute indifference whether the decision will affect a population of 250,000 or a single individual carrying on a manufactory for his own benefit."

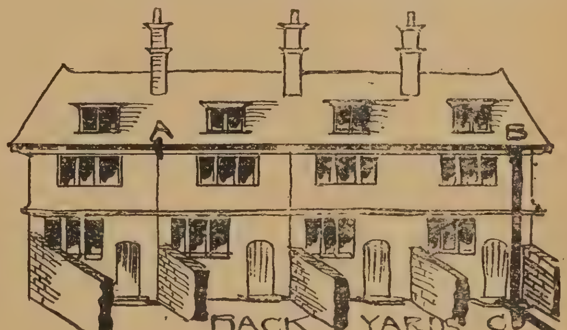

FIG. 8.

I trust that the points I have dealt with will not be without interest and value to you.

Masters and Men.

The Penrhyn Quarry.—Since work was resumed at the quarry on June 11th the number of men employed has steadily increased, especially during the last month, which showed an increase of forty, the increase during September having been twenty-seven. These included twenty-nine slate-makers and thirty-eight labourers and day-men. The production of slates has similarly increased very satisfactorily; in fact, the output last month was at the rate of 34,000 tons per annum.

The Metal Trades of Birmingham.—At a meeting yesterday of employers and workmen engaged in the metal trades of Birmingham and district it was decided to terminate the alliance, which has existed for the past five years. Between 4,000 and 5,000 men are affected. The 5 per cent. bonus which the men are at present receiving is to be the subject of further consideration. The alliance has never been very successful, owing to several of the largest firms of metal-rollers declining to join. The decision to terminate it was taken on the initiative of employers, many of whom were dissatisfied with it.

Trouble in Birmingham.—The builders' labourers section of the Birmingham Wages Board have met the proposal of the masters to reduce wages by ½d. per hour from April 1st next by a counter-claim for an advance. The carpenters and joiners will also ask for a ½d. advance. They will also resist the proposed alteration of the working rules, which leaves the rating of a workman as superior or inferior, with wages accordingly, to the employer—a rule which was abandoned as far back as 1890—and another stipulating that a full working week shall be made before overtime is charged, work to commence at 6 a.m. instead of 6.30.

Surveying and Sanitary Notes.

Mr. J. A. Wallington, a well-known surveyor and land agent, has died at Chineham, Basingstoke at the age of forty-eight. He had an extensive practice in Basingstoke, and during the last three or four years acted as surveyor for the L. and S.W.R. in that neighbourhood.

The Westminster Paving Scandal.—Mr. J. Mac-Connell, hon. secretary of the Wesminster Ratepayers' Committee, sends us a lengthy circular condemning the "bogus enquiry" of the Westminster City Council Works Committee into the allegations of favouritism and jobbery in the paving contracts, which enquiry is described as utterly worthless. With regard to the 8in. deal contract, it is said: "A perusal of the laboured report relating to this shows that the whole of the facts disclosed by our Committee are absolutely correct in every detail, and by not rescinding this iniquitous contract the Works Committee have deliberately flouted every responsible and public opinion." With regard to the statement in the Works Committee's report that certain Australian wood laid in the Strand district in 1895 "has worn well, but that the late Strand District Board felt a definite approval of the wood could not be given until it had been tested for a sufficient period to show that it is as durable as the timber at present in use," the Ratepayers' Committee says: "The wood referred to as being 'at present in use' is deal, and is that of the favourite contractors, the Improved Wood Pavement Co. The first experimental order for red gum was given in Westminster without competition hardly a year ago. When the Works Committee of the Westminster City Council decide upon enormous paving contracts they find that one or two years' experience of an American wood (unknown in this country or the States) is sufficient to induce them to adopt it on a gigantic scale, whilst six or seven years' experience of Colonial woods (universally tried and adopted and recommended by the most eminent surveyors and engineers) does not warrant a single order."

Trade and Craft.

Tests with Slag Wool.

The pamphlet of "Notes on Non-Conductors of Heat" which has just been issued by Messrs. Frederick Jones & Co., of Perrin Street, Kentish Town, N.W., contains particulars of several useful tests with silicate cotton ("slag wool"), which is a pure mineral fibre blown from molten slag as it runs from the iron furnaces. As the result of four series of tests conducted in 1881, 1884, 1891 and 1894 by four different experts, it was found to be a much better non-conductor than hair-felt, papier-maché, sawdust, charcoal, asbestos and several other substances. Then again, Mr. Walter Jones, the well-known heating engineer of Stourbridge, has found that a 4in. pipe filled with hot water, and exposed to the outside air at 33 degs. Fahr., lost 90 degs. in 9¾ hours when covered with slag wool, whereas a similar pipe covered with sawdust lost the same number of degrees in a little over 8 hours, and an uncovered pipe in 2½ hours; that is to say, the last pipe cooled nearly four times as rapidly as that encased with silicate cotton. Its efficiency as an insulator for refrigerating chambers is proved by the following tests: A block of ice weighing 23lbs. was placed in a zinc box and encased with 2in. of silicate cotton, the average temperature of the room being 90 degs. Fahr. After 48 hours the ice was taken out and showed a loss of 12½lbs. Next, under similar conditions, a piece of ice weighing 26lbs. was encased with 6in. of charcoal, but after the same time it was found to have lost 18¼lbs., thus proving its inferiority as a non-conductor. Silicate cotton can be obtained loose, in wire-netted sheets (with or without a backing of galvanized iron), in strips, or in cloth form; but in case none of these are convenient to use, Messrs. Frederick Jones & Co. supply a cement consisting of fossil meal and other ingredients, with silicate cotton as the binding agent.

The Public Lighting of Liverpool.

Mr. C. R. Bellamy, the lighting engineer of Liverpool, has prepared a report in which he reviews the enormous improvements which have taken place in the lighting of the city during the last few years. In December, 1898, it was decided to apply the system of incandescent gas-lighting to the whole of Liverpool, the extension to be carried out at such a rate as the surplus funds at disposal would permit, which was estimated to occupy four years. The change, however, has been made in three years, leaving in the present year a surplus of £1,000 applicable to other street-lighting improvements. During the past six years the following work has been carried out in the Old City at a first cost of £32,956:—353 new lamps have been fixed in the Old streets; 928 passage lamps have been fixed, lighting the back entrances to 21,481 houses; 8,908 incandescent gas lamps have been fixed over 248 miles of road; and 152 electric arc-lamps have been erected over an area of 3¾ miles of road. There are 11,905 lamps in use in the Old City, with an aggregate illuminating value of 2,261½ millions of candles, at an annual cost for lighting and maintenance of £36,187 11s. 8d., the illuminating power being estimated as follows: 10-amp. electric arc lamps, 500 candles; incandescent gas, 40 candles per burner; and the ordinary flat flame at 16 candles. The year 1893 was the last in which the gas company had entire control, and the cost of the lighting for that year was £40,889 12s. 1d. On January 1st, 1894, the Corporation took over the lighting, &c., of the special lamps, and by the end of December the whole of the lighting of the city was in the hands of the Electric Power and Lighting Committee. The illuminating power of the lamps has been increased before midnight from 466¾ million candles to 1,576½ million candles, or nearly four times; after midnight, from 304½ million candles to 685 million candles, or more than double; whilst the total charges have fallen from £40,889 in 1893 to £39,587 in the present year (the last three months being an ample estimate), or a reduction of £1,302. There has been an increase in the lighting value of 5½ times to midnight, and three times from midnight to sunrise, which has been secured under an additional annual expenditure of £706, or 10 per cent. The public lighting throughout the Old City, inclusive of passage lighting and an average total increase in the aggregate lighting of over 200 per cent., is costing less than it did in 1893; which must be of considerable satisfaction to the Welsbach Incandescent Gas Light Co., Ltd., of Palmer Street and York Street, Westminster, the firm who installed the new lamps.

COMING EVENTS.

Wednesday, November 27.

Society of Arts.—Mr. J. Gordon Parker on "Leather for Bookbinding," 8 p.m.

Northern Architectural Association.—Council Meeting at 6.45 p.m. Mr. Henry S. Kerr on "Melrose Abbey," at 7.30 p.m.

City of London College Science Society.—Mr. E. R. Calthrop, M.I.M.E., on "Narrow Gauge Light Railways of Heavy Traffic Capacity," 7.30 p.m.

Thursday, November 28.

Society of Architects.—Presidential Address by Mr. Silvanus Trevail, F.R.I.B.A., 8 p.m.

Royal Academy.—Demonstration in Anatomy: The Lower Extremity. By Prof. Arthur Thomson, M.A., 4 p.m.

Institution of Electrical Engineers.—Meeting at 8 p.m.

Edinburgh Architectural Association.—Mr. Louis A. Barnier, B.A., on "The Old Monuments of Provence," 8 p.m.

Incorporated Institute of British Decorators (Northern District)—Mr. George C. Haité, R.I., R.B.A., on 'Decoration and Decorators, a Survey of the Past and Present," I., in the lecture room of the Young Men's Christian Association, Fargate, Sheffield, 7.30 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Friday, November 29.

Architectural Association.—Mr. A. Mitchell will read Mr. Francis Bond's paper on "Capitals," 7.30 p.m.

Saturday, November 30.

Dundee Institute of Architecture.—Mr. W. Page on "Notes on Art," 7 p.m.

Monday, December 2.

Royal Institute of British Architects.—Business Meeting. Election of Candidates for Membership. Mr. Lacy W. Ridge to move:—"That the R.I.B.A. desires to thank the Local Government Board for the issue of 'Model By-laws IV. (Rural Districts)' While doing so, it would urge on the Board the desirability of preparing a model to enable Rural District Councils to regulate party-walls as distinct from external walls, a matter for which the Urban Model By-laws, to which the Board refer them, are not available. The Institute ground this on the belief that the existence of properly-constructed party-walls has proved an efficient barrier to the spread of fire, and that it is undesirable that such protection should be withdrawn in places where it already existed." Mr. Herbert W. Wills to move:—"That in the interests of the profession it would be adviseable to have a list of 'Institute Assessors' drawn up, from whom the President would nominate, and that this list be from year to year revised." 8 p.m.

Society of Engineers.—Mr. H. Alfred Roechling, C.E., F.G.S., on "The Sewage Question during the last Century." 7.30 p.m.

Liverpool Architectural Society.—Mr. C. E. Bateman, F.R.I.B.A., on "Castle Bromwich Church," 6 p.m.

Royal Academy.—Demonstration in Anatomy: The Lower Extremity. By Prof. Arthur Thomson, M.A., 4 p.m.

Birmingham and District Clerks of Works' and Builders' Foremen's Association.—Mr. R. W. Newman, A.M.I.C.E., M.I.M.E., on "The Sanitary Engineering of Dwellings," 8 p.m.

Tuesday, December 3.

Architectural Association of Ireland.—Meeting at 7.45 p.m.

Land Law Reform Association.—Conference on Housing in Country and Town, 11 a.m. and 2 p.m.

Wednesday, December 4.

Ruskin Society of Birmingham.—The Rev. Professor H. C. Beeching on "Ruskin as a Man of Letters," 7.45 p.m.

Northern Architectural Association.—Students' Evening.

Society of Arts.—Mr. Herbert Stone on "The Identification of Wood and its Application to Scientific and Commercial Purposes," 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Edinburgh Architectural Association (Associates' Section).—Mr. John Ednie on "The Applied Art of To-day and Yesterday." 8 p.m.

Thursday, December 5.

Royal Academy.—Demonstration in Anatomy: The Head and Neck. By Prof. Arthur Thomson, M.A. 4 p.m.

Society of Arts (Indian Section).—Mr. Edward Penton, B.A., on "The Nushki-Seistan Route," 4.30 p.m.

Friday, December 6.

Architectural Association (Discussion Section).—Mr. Sydney Perks on "The Ethics of Dilapidations," 7.30 p.m.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Nov. 28	Sheffield—Stabling, &c., at Hospital	City Hospitals Committee	C. F. Wilke, City Surveyor, Town Hall, Sheffield.
„ 28	Rathmines—Workmen's Dwellings	Urban District Council	F. Beckett & Metcalf, 10 Leinster Street, Rathmines.
„ 28	Askam-in-Furness—Sunday Schools	Rev. W. Carr	Rev. W. Carr, Slater Terrace, Dalton-in-Furness.
„ 28	Consett—Fourteen Cottages	Consett Iron Co., Ltd.	C. E. Oliver, Company's Architect, General Offices, Consett.
„ 28	Kilkenny—Boundary Wall, &c.	Rural District Council	K. Comerford, Clerk, Kilkenny.
„ 28	Macclesfield—Improving School	Managers of Certified Industrial School	J. Wright, Architect, Macclesfield.
„ 28	Moss Side, Lancs—Bowl House, Shelters, &c.	Urban District Council	H. B. Longley, Engineer, Council Offices, Moss Side, Manchester.
„ 28	Ramsgate—Shelter Seat round Flag Staff	Corporation	Borough Surveyor, Albion House, Ramsgate.
„ 28	Wanstead, Essex—Wooden Room on Brick Substructure	Urban District Council	C. H. Bressey, Surveyor, Council Offices, Wanstead, N.E.
„ 28	Bradford—Firebricks, Retorts, &c.	Corporation	Gas Office, Town Hall, Bradford.
„ 28	Macclesfield—Improving Industrial School	Managers	J. Wright, Architect, Macclesfield.
„ 29	Ross Links, near Bamburgh—Coastguard Buildings	Admiralty	Director, Works Dept., Admiralty, Northumberland Avenue, W.C.
„ 29	Warrington—Cement Bricks &c	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 29	Halifax—Alterations, &c., to Bakery	Industrial Society	M. Hall, 29 Northgate, Halifax.
„ 29	Hereford—Two Cottages	—	Nicholson & Hartree, Architects, Hereford.
„ 30	Whitby—Alterations, &c., to Property	Co-operative Society	J. J. Milligan, Architect, Baxtergate, Whitby.
„ 30	Trelewis, Wales—Thirteen Houses and Two Shops	Building Club	T. Roderick, Architect, Ashbrook House, Clifton Street Aberdare.
„ 30	Sheffield—Fireclay Goods	United Gaslight Company	J. W. Morrison, Offices, Commercial Street, Sheffield.
„ 30	Aberkenfig, Wales—Four Houses	Mrs E. J. Pugh	Prince of Wales Hotel, Aberkenfig.
„ 30	Worcester—Two Pairs of Cottages	Lunatic Asylum Committee	H. Rowe & Son, Architects, Worcester Chambers, Pierpoint Street, Worcester.
„ 30	Clinch Green, Bexhill—Cemetery Chapel	Urban District Council	W. H. Alton, Architect, Devonshire Chambers, Bexhill.
„ 30	Halifax—Infants' School	School Board	C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.
„ 30	Egremont, Cumberland—Schools	School Board	J. S. Moffatt, 53 Church Street, Whitehaven.
„ 30	Ripponden, near Halifax—Liberal Club and Hall	—	W. O. Williams, 29 Southgate, Halifax.
„ 30	Illogan, Cornwall—Girls' School	School Board	S. Hill, Architect. Green Lane, Redruth.
„ 30	Windermere—Residence	J. Mudd	R. Walker, Architect, Windermere.
„ 30	Hornsey, N.—Pulling Down & Clearing Site of Priory	—	J. Farrer, 2 Colman Street, E.C.
Dec. 2	Belfast—Assembly Buildings	General Assembly of Presbyterian Church	W. H. Stephens & Son, Donegall Square Buildings, Belfast.
„ 2	Cardiff—Additions to Warehouses	J. Isaac & Sons	E. G. C. Down, 31 High Street, Cardiff.
„ 2	Farnborough, Hants—Residence and Stabling	—	W. E. Trevena, Ridgemount, Southampton Rd., Farnborough Hants.
„ 2	Aylsham, Norfolk—Converting Dormitories into Sick Wards.	Board of Guardians	J. B. Pearce, 15 Upper King Street, Norwich.
„ 2	Dungeness, Kent—Lighthouse, Fog-Signal House, &c.	Corporation of Trinity House	E. G. Verity, 7 Great Marlborough Street W.
„ 2	Church Hill, Brownhills—Alterations, &c., to Schools	Norton-under-Cannock U D. Sch. Bd.	T. H. Fleeming, 102 Darlington Street, Wolverhampton.
„ 2	Ballywater, Ireland—New Gothenburg Inn	Right Hon. Baron Dunleath	W. J. Fennell, 2 Wellington Place, Belfast.
„ 2	Glasgow—Hospital	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
„ 2	Lower Garndiffaith, near Pontypool—School	Trevethin School Board	Lansdowne & Griggs, Architects, Newport, Mon.
„ 2	Quaker's Yard, Glamorgan—Nineteen Cottages	Windsor Building Club	W. Dowdeswell, Architect, John Street, Treharris.
„ 2	Bandon—Pair of Semi-detached Villas	E. H. Harte	W. H. Hill & Son, 28 South Mall, Cork.
„ 2	Fermoy—Villa Residence	Major Young	W. H. Hill & Son, 28 South Mall, Cork.
„ 2	Ilfracombe—Pulling Down and Rebuilding Inn	S. W. Arnold & Sons, Ltd.	Smyth-Richards & Fox, 3 Castle Street, Barnstaple.
„ 2	Sheffield—Terracing near Cricket Pavilion	United Cricket and Football Club, Ltd.	J. Nicholson, Secretary, Pavilion, Bramall Lane Ground, Sheffield.
„ 3	Skerton, Lancaster—Infant School and Additions	Lancaster School Board	Wright & Son, Surveyors, Lancaster.
„ 3	Leytonstone—Extending Buildings at Electric Lighting Works.	Urban District Council	W. Dawson, Borough Engineer, Town Hall, Leyton.
„ 3	Dublin—Bricks, Tiles, Cement, &c.	Midland Great Western Rly. Co. (Ireland)	R. L. Badham, Secretary, Broadstone Station, Dublin.
„ 3	Filton—Station Buildings	Great Western Railway Company	Engineer, Bristol Station.
„ 3	Bromley—Addition to Asylum Laundry	Managers	J. & S. F. Clarkson, 136 High Street, Poplar, E.
„ 3	Dartford—Refuse-Destructor	Urban District Council	J. C. Hayward, Clerk, Sessions House, Dartford.
„ 4	Leamington—Additions, &c, to Pump Room Baths	Corporation	Borough Engineer, Town Hall, Leamington.
„ 4	Sunderland—Cement Retaining-Wall	Corporation	Borough Engineer, Town Hall, Sunderland.
„ 4	Southampton—Alterations, &c., to Ordnance Survey Offices.	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
„ 5	Warwick—Infirmary (151 Inmates and Staff)	Union Guardians	F. P. Trepass, 8 Jury Street, Warwick.
„ 5	London, W.—Block of Offices, Stabling and Tenements	Wilts United Dairies, Ltd.	Pilditch, Chadwick, & Co., 2 Pall Mall East, Charing Cross, W.C.
„ 5	Cardiff—Jobbing Works	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
„ 6	Dublin—Cement, Barrows and Trucks, Ladders, &c.	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier Street, Dublin.
„ 6	Croydon—Extension to Polytechnics	Town Council	Deputy Borough Engineer, Town Hall, Croydon.
„ 7	Blaenavon, Mon.—Sliding Partitions, &c., at Schools (Two Contracts).	School Board	Lansdowne & Griggs, Architects, Metropolitan Bank Chambers, Newport, Mon.
„ 9	Bodringallt, Wales—Schools	Ystradyfodwg School Board	J. Rees, Architect, Hillside Cottage, Pentre.
„ 9	Middlesbrough—County Court	Commissioners of H.M. Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
„ 9	Wolverhampton—Ice Factory and Cold Stores	Markets Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„ 9	Wolverhampton—Alterations, &c., to Town Hall	Council	F. T. Book, Architect, Weelfoun Chambers, Darlington Street, Wolverhampton.
„ 9	Erith—Engine and Boiler House, Chimney Shaft, &c.	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
„ 10	Conisborough—Isolation Hospital	Doncaster and Mexborough Joint Hospital Board.	J. H. Morton, 50 King Street, South Shields.
„ 10	Kirkcross and Brigham—Lime Quarry Working	—	Allerdale Coal Co, Ltd., Workington.
No date.	Watford—Boys' Department at School	School Board	J. Hunt, 40 Upper Baker Street, N.W.
„	Broadstairs—House	—	W. H. Woodrofe, 32 High Street, Southwark, S.E.
„	Derby—Brick and Stone Church	Mrs. Francis Ley	E. R. Ridgway, Architect, Long Eaton.
	ENGINEERING:		
Nov. 28	East Barnet—Bridge	Urban District Council	H. York, Surveyor, Station Road, New Barnet.
„ 28	Nelson, Lancs—Reservoir (160 million Gallons)	Corporation	J. Newton, Son & Bayley, 17 Cooper Street, Manchester.
„ 28	St. Ninian's, Stirlingshire—Reservoir	—	Crouch & Hogg, 53 Bothwell Street, Glasgow.
„ 28	London, E.C.—Two Bogie Wagons and nine Carriages	Nizam's Guaranteed State Rlys. Co., Ltd.	Secretary, 50 Old Broad Street, E.C.
„ 28	Hull—Six Rotary Transformers	Electric Lighting Committee	T. G. Milner, Town Hall, Hull.
„ 28	Ashton-in-Makerfield, Lancs—Extension of Gasworks	Urban District Council	A. Sykes, Clerk, Council Offices, Bryan Street, Ashton-in-Makerfield.
„ 29	Celbridge, Ireland—Pump Well	Rural District Council	F. Shortt, Clerk, Celbridge.
„ 30	Kirkcaldy—Tramway Rolling-stock	Corporation	Kennedy & Jenkin, 17 Victoria Street, Westminster, S.W.
„ 30	Cleckheaton, Yorks—Electrical Plant	Urban District Council	Clerk to Council, Town Hall, Cleckheaton.
„ 30	Clitheroe, Lancs—Sewage Settling Tanks, &c.	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.
„ 30	Buxton—Retaining Walls, Steel & Concrete Covoring	Urban District Council	Gas Engineer, Town Hall, Buxton.
Dec. 2	Tripcock Point, Plumstead, Kent—Steel Light-house	Corporation of Trinity House	C. A. Kent, Secretary, Trinity House, London, E.C.
„ 2	London, S.E.—Steam Boilers, &c., at Public Baths, &c.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Camberwell, S.E.
„ 2	Dungeness, Kent—Lighthouse, Fog-Signal House, &c.	Corporation of Trinity House	E. G. Verity, 7 Great Marlborough Street, W.
„ 2	Exeter—Crane	City Council	City Engineer, 18 Bedford Circus, Exeter.
„ 2	Plumstead, Kent—Steel Lighthouse	Corporation of Trinity House	C. A. Kent, Secretary, Trinity House, London, E.C.
„ 2	Dewsbury—Dynamos	Corporation	R. H. Campion, Borough Electrical Engineer, Dewsbury.
„ 3	Dartford—Refuse-Destructor	Urban District Council	J. C. Hayward, Clerk, Sessions House, Dartford.
„ 3	London, E.C.—Artesian Well at Baths	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Old Street, E.C.
„ 4	Manchester—Boilers, Economisers, Feed Pumps, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester.
„ 5	Warwick—Steam, Cooking, &c., Apparatus & Fittings	Union Guardians	F. P. Trespass, 8 Jury Street, Warwick.
„ 6	Hull—Construction of New Dock (50 acres)	Joint Dock Committee	Sir J. Wolfe Barry & Partners, 21 Delahay Street, Westminster.
„ 6	Croydon—Heating Polytechnics	—	Deputy Borough Engineer, Town Hall, Croydon.
„ 9	London, W.C.—Light Radiators	School Board	Contracts Sub-Dept., School Board Offices, Victoria Embankment.
	IRON AND STEEL:		
Nov. 28	Glasgow—Cast-iron and Steelwork, &c., to Warehouses	Corporation	Thomson & Sandilands, 241 West George Street, Glasgow.
„ 28	Sheffield—Ironfounder's Work at Hospital	Corporation	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 29	Warrington—Nails, Screws, Bolts, Fishplates, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
„ 30	Carlisle—870 lineal yds. of Fencing, Gates, &c., at Cattle Market.	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
„ 30	Swansea—Iron Castings, Ironmongery, &c.	Harbour Trustees	Engineer, Harbour Office, Swansea.
„ 30	Pencoed, Wales—Lamp-pillars, &c.	Parish Council	W. H. Mainwaring, Clerk, Llwynon, Pencoed.
„ 30	Dundalk—Ironmongery, &c.	Commissioners of Public Works	Office of Public Works, Dublin.
Dec. 2	Margate—Pipes, Tubes, Fittings, &c.	Corporation	F. Stanley, Manager, Waterworks Office, Municipal Buildings, Market Place, Margate.
„ 2	Leeds—Boundary Wall with W.I. Palisading	Union Guardians	J. M. Bottomley, 13 Bond Street, Leeds.
„ 2	Dublin—Iron, &c.	Grand Canal Co.	G. Tough, General Manager, James's Street Harbour, Dublin.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL—*cont.*:		
Dec. 3	London—Steel Bridge Girders, &c.	Great Western Railway	Engineer, Paddington Station, London.
" 3	London, E C.—Stores	South Indian Railway Co., Ltd.	Secretary, 56 Gracechurch Street, E C.
" 3	Dublin—Bolts, Rivets, Iron Castings, &c.	Midland Great Western Ry. Co. (Ireland)	R. L. Badham Secretary, Broadstone Station, Dublin.
" 4	Dublin—Iron Castings, Boiler Tubes, &c.	City of Dublin Steam Packet Co.	Secretary, 15 Eden Quay, Dublin
" 4	London, E.C.—Tools and Stores	East Indian Railway Co.	C. W. Young, Secretary, Nicholas Lane, E.C.
" 5	Cardiff—Cast-iron Street Surface Covers, &c.	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
" 6	Dublin—Iron Stores, &c.	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier St., Dublin.
No date.	Rustington, Worthing—Supply and Erection of Cast Iron Tank (10,000gals)	T. Summers	T. Summers, Broadmark Estate, Rustington, Worthing.
	PAINTING AND PLUMBING:		
Nov. 28	Rathmines—Plumbing to Workmen's Dwellings, &c.	Urban District Council	Beckett & Metcalf, 10 Leinster Street, Rathmines.
" 28	Sheffield—Plumber, Painter and Glazier Work at Hospital.	City Hospitals Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 28	Glasgow—Plumber & Painter Work and Gas Fittings at Warehouses, &c.	Corporation	Thomson & Sandilands, 241 West George Street, Glasgow.
" 28	Greenock—Oils, Paints, &c.	Harbour Trustees	Engineer, Municipal Buildings, Greenock.
" 29	Warrington—White Lead, Oils, Lead Piping & Sheet, Brushes, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
" 30	Swansea—Oils, &c.	Harbour Trustees	Engineer, Harbour Office, Swansea.
Dec. 2	Dublin—Paints, Varnish, White and Red Lead, &c.	Grand Canal Co.	G. Tough, General Manager, James's Street Harbour, Dublin.
" 2	Sheffield—Plumbers' and Glaziers' Repairs, &c.	School Board	J. F. Moss, Clerk, School Board Offices, Sheffield.
" 3	Dublin—Brushes, Lead, Varnish, Paints, Oils, &c.	Midland Great Western Ry. Co. (Ireland)	R. L. Badham, Secretary, Broadstone Station, Dublin.
" 4	Dublin—Paints, Oils, &c	City of Dublin Steam Packet Co.	Secretary, 15 Eden Quay, Dublin.
" 5	Cardiff—Lead Service Work, &c.	Corporation	C. H. Priestly, Waterworks Engineer, Town Hall, Cardiff.
" 6	Dublin—Brushes, Oils, Plumbing Work, White Lead, &c.	Commissioners of Irish Lights	O. Armstrong, Secretary Irish Lights Office, D'Olier St, Dublin.
" 11	Dublin—Paints, Oils, White and Red Lead, &c.	Port and Docks Board	N. Proud, Secretary, Port & Docks Office, Westmoreland St., Dublin.
	ROADS AND CARTAGE:		
Nov. 28	Rathmines—Roads, Footpaths, &c.	Urban District Council	Beckett & Medcalf, 10 Leinster Street, Rathmines.
" 29	Heswall, Cheshire—Road	Wirral Rural District Council	W. H. Churton, Clerk, Eastgate Buildings, Chester.
" 29	Withington, Lancs—Street Works	Urban District Council	A. H. Mountain, Surveyor to Council, Withington.
" 30	Dunstable—Roads and Paths	Town Council	C. C. S Benning, Town Clerk, Dunstable.
" 30	Grays, Essex—Laying out Playfield	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
Dec. 2	Exeter—6,000 cubic yds. of clinkers	City Council	D. Cameron, 18 Bedford Circus, Exeter.
" 2	Warrington—Watering Van and Tumbler Cart	Paving and Sewerage Committee	Borough Surveyor, Town Hall, Warrington.
" 2	Warrington—Repairs of Watering Vans and Carts	Paving and Sewerage Committee	Borough Surveyor, Town Hall, Warrington.
" 2	Birkenhead—400 tons of Macadam	Corporation	A. Gill, Town Clerk, Town Hall, Birkenhead.
" 2	Romford, Essex—Materials	Urban District Council	J. Turvey, Surveyor, Romford.
" 2	Warrington—Paving, Kerbing and Footway Laying	Paving and Sewerage Committee	Borough Surveyor, Town Hall, Warrington.
" 3	Whitley, Northumberland Road Works	Urban District Council	J. P. Spencer, 30 Howard Street, North Shields.
" 3	Hounstow—Artificial Stone Paving, Granite, &c.	Heston and Isleworth U.D.C.	P. G. Parkman, Council's Surveyor, Town Hall, Hounslow.
" 4	Hove, Sussex—Paving Works	——	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 4	Hove—Paving Works and Laying Cabstands	——	H. H. Scott, Borough Surveyor, Town Hall, Hove.
" 7	Southowram, near Halifax—Flagging Playground	School Board	J. T. Morton, Clerk, Argyle Street, Halifax.
" 9	Erith—Approach Roads to Electric Light Station	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
No date	Loughborough—Extension and Widening of Streets	Corporation	A. W. Walker, Borough Surveyor, Town Hall, Loughborough.
	SANITARY;		
Nov. 28	Rathmines—Sewers, Sanitary, Plumbing, &c.	Urban District Council	Beckett & Medcalf, 10 Leinster Street, Rathmines.
" 28	Gourdon, Scotland—Scavenging	County Council	J. Graham, County Sanitary Inspector, Public Health Office, County Buildings, Stonehaven.
" 28	Edinburgh—Pipe Sewers	Magistrates and Council	Burgh Engineer, City Chambers, Edinburgh.
" 29	Felixstowe—Sewer	Urban District Council	S. E Fisher, Surveyor, Town Hall, Felixstowe.
" 29	Maldon—Drainage of Village	Rural District Council	R. Richardson, Engineer, Town Hall, Malton.
" 29	Warrington—Drain Pipes, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
" 30	Clitheroe, Lancs—Two Setting Tanks on Sewage Farm	Corporation	A. R. Bleavard, Borough Surveyor, Church Street, Clitheroe.
" 30	Holmfirth, Yorks—Sewerage and Sewage Disposal Works.	Urban District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster, S.W.
" 30	Williton, Somerset—Drainage System, &c., at Workhouse.	Guardians	T. H. Andrew, Surveyor, Williton.
" 30	Chorley, Lancs—Disinfecting Fluid	Corporation	J. Mills, Town Clerk, Town Hall, Chorley.
Dec. 1	Ashstead, Surrey—Scavenging	Parish Council	J. Ewington, Clerk, Woodfield Lane, Ashstead.
" 3	London, E.C.—Barging Refuse	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Shoreditch Town Hall, Old Street, E.C.
" 3	London, W.—Removal of House-refuse	St Marylebone Borough Council	Town Clerk, Town Hall, Marylebone Lane, W.
" 3	Dartford—Refuse-Destructor	Urban District Council	J. C. Hayward, Clerk, Sessions House, Dartford.
" 4	Littleover, Shardlow, Derby—Removal of Nightsoil, Refuse, &c.	Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
" 4	Sawley, Shardlow, Derby—Removal of Nightsoil, Refuse, &c.	Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
" 4	Cherryhinton, Cambridge—Sewerage Works	Chesterton Rural District Council	Beesley, Son & Nichols.
" 9	Erith—Sanitary Work, Drains, &c.	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
" 14	Wantage, Berks—Sewerage & Sewage Disposal Works	Urban District Council	Cameron, Conuwin & Martin, 7 & 8 Bedford Circus, Exeter.
	TIMBER:		
Nov. 28	Greenock—Timber	Harbour Trustees	Engineer, Municipal Buildings, Greenock.
" 29	Warrington—Creosoted Sleepers and Crossing Timbers, &c.	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
" 30	Swansea—Timber	Harbour Trustees	Engineer, Harbour Office, Swansea.
Dec. 2	Dublin—Timber	Grand Canal Company	G. Tough, General Manager, James's St. Harbour, Dublin.
" 3	Dublin—Timber	Midland Gt. Western Railway Co. (Ireland)	R. L. Badham, Secretary, Broadstone Station, Dublin.
" 4	Great Stanmore, Middlesex	Hendon Rural District Council	F. J. Seabrook, Clerk, Council Offices, Edgware.
" 4	Dublin—Timber	City of Dublin Steampacket Co.	Secretary, 15 Eden Quay, Dublin.
" 6	Dublin—Timber	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier St., Dublin.
" 6	Warwick—Wood	Union Guardians	C. H. Passman, 48 Bedford Street, Leamington Spa.
" 9	Llanelly—Two Timber Jetties	Navigation Commissioners	H. W. Spowatt, Clerk, Harbour Office, Llanelly.
" 11	Dublin—Planks and Deals	Port and Docks Board	N. Proud, Secretary, Port & Docks Office, Westmoreland St., Dublin.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 17	Tywardreath—Board Schools	——	J. Cook, Clerk to School Board, Tywardreath, Par Station, Cornwall
" 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902. Jan. 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
" 15	Kirkcaldy—Elementary School (400 pupils)	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
" 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statute to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

TENDERS.

Information from accredited sources should be sent to. "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRYNTEG (WALES).—For the erection of school buildings, Brynteg, for the Broughton School Board. Messrs. Lockwood & Sons, architects, 80 Foregate Street, Chester:—

New schools.

T. Williams	£3,899	19	0
W. E. Samuel	3,600	0	0
R. Williams	3,498	14	6
Davies Bros.	3,385	0	0
W. H. Wycherley,* Broughton, near Wrexham	3,169	0	0

Alterations.

T. Williams	1,509	7	0
W. E. Samuel	1,380	0	0
Davies Bros.	1,317	0	0
R. Williams	1,281	12	0
W. H. Wycherley*	1,199	0	0

* Accepted.

DOVER.—For the erection of an infirmary and nurses' home at the Workhouse, Dover, for the Guardians. Messrs. Cresswell & Newman, architects, Castle Street, Dover:—

G. Munro	£7,992	0
Brisley Bros.	7,988	0
Turner, Walmer	7,965	0
Tapner, Hastings	7,890	0
Warren & Son	7,732	0
Gann, Whitstable	7,6[illegible]5	0
G. H. Denne, Walmer	7,674	0
G. Keeler	7,655	0
Austen & Lewis	7,492	0
W. G. Lewis	7,430	10
W. Bromley	7,410	0
G. Lewis & Son	6,290	0

[Rest of Dover.]

EXMOUTH (LYMPSTONE).—For the erection of two cottages at Courtlands Cross, for Mr. S. Hull, J.P. Mr. Ernest E. Ellis, architect, Exmouth and Salterton:—

G. Hooper	£650	0
W. H. Perry	635	0
W. H. Chown, Lympstone	620	0
Cooper & Sons	620	0
H. Dart	555	0
E. G. Neuman, Lympstone	550	0
N. Pratt, Clyst St. Mary	512	10
J. J. Lacey	500	0
R. B. Ponsford*	490	0
A. Hayman†	466	14

* Accepted. † Withdrawn. [Rest of Exmouth.]

EXMOUTH.—Accepted for alterations to premises, Rolle Street, for Mr. C. H. Palmer. Mr. Ernest E. Ellis, architect, Exmouth and Salterton:—

T. Abell., Exmouth,

EXMOUTH (LYMPSTONE).—Accepted for erection of stable and loft for Mr. C. Winter. Mr. Ernest E. Ellis, architect, Exmouth and Salterton:—

Cooper & Sons, Exmouth.

HANDSWORTH (STAFFS).—For the laying of sewers, together with manholes, flushing chamber, &c., in Oxhill Road, Sandwell Road, through private garden property and meadow land, within the district, for the Handsworth Urban District Council. Mr. H. Richardson, A.M.I.C.E., surveyor:—

Nicholls & Co., Villa Street, Birmingham	£2,636
A. Cooper, Rotton Park Road, Birmingham	2,209
G. Trentham, Heathfield Road, Handsworth	2,189
Currall, Lewis, & Martin, Icknield Port Road, Birmingham	2,048
J. White, jun., Boulton Road, Handsworth	2,043
H. Weldon, Chamberlain Square, Birmingham	1,885
T. Vale, Stourport	1,742
J. McKay,* Bearwood Road, Smethwick	1,707

* Accepted.

HOWICK (near PRESTON).—For the erection of cottages at Howick, near Preston, for Mr. C. B. Winder. Messrs. Todd & Morris, architects, Gresham Chambers, Lord Street, Southport:—

John Walmsley, Preston	£910	0	0
Duxfield Bros., Southport	883	14	5
Wm. Hethersell, Preston	832	0	0
A. K. Irving & Sons, Southport	825	0	0
Vaughan Bros., Southport	795	0	0
Wm. Whiteside, Preston	792	8	0
P. R. Morris,* Southport	779	15	0
J. Myerscough, Preston	760	5	0

* Accepted with modifications.

LONDON.—For improvements at Alexis Street School, for the London School Board. Mr. T. J. Bailey, architect:—

McCormick & Sons	£13,786	0
F. & H. F. Higgs	13,649	0
W. Downs	13,386	0
J. Marsland & Sons	13,035	0
J. Chessum & Sons	12,999	2
Clarke & Bracey	12,583	0
Treasure & Son*	12,188	0
T. L. Green	11,292	0

* Recommended for acceptance.

LONDON.—For enlargement of Ennersdale Road School, for the London School Board. Mr. T. J. Bailey, architect:—

W. Downs	£8,424
Kirk & Randall	8,236
F. & H. F. Higgs	7,803
Johnson & Co.	7,752
T. D. Leng	7,548
E. P. Bulled & Co.	7,379
J. Garret and Son	7,355
Holliday & Greenwood, Ltd.	7,290
J. & M. Patrick	7,049
J. Smith & Sons, Ltd.	6,962
J. & C. Bowyer	6,897
W. Johnson & Co., Ltd.	6,730
Treasure & Son, London and Shrewsbury*	6,654

* Recommended for acceptance.

LONDON, E.—For the erection of two blocks of buildings on a site at Carter Road, Plaistow, E., comprising pupil teachers' laundry, and cookery centres, and caretaker's house, for the West Ham School Board. Mr. William Jacques, architect to the Board, 2 Fen Court, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

A. E. Symes	£26,111
B. E. Nightingale	24,901
Stimpson & Co.	22,537
Battley, Sons, & Holness	22,319
G. Sharpe	22,055
W. J. Maddison	21,615
A. Reed	21,[illegible]20
Gregar & Son,* Stratford	21,159

* Provisionally accepted.

LONDON, N.—For the erection of a Presbytarian Church at Muswell Hill, N. Messrs. George Baines, F.R.I.B.A., & Reginald P. Baines, architects, 5 Clements Inn, Strand, London:—

Lascelles & Co.	£7,820
Higgs & Hill	7,562
H. F. & H. Higgs	7,560
Mattock Bros.	7,267
W. J. Maddison	7,261
J. Chessum & Son	7,244
Holliday & Greenwood	7,222
Battley, Sons & Holness	7,048
Thompson & Beveridge	6,979
Turtle & Appleton	6,971
T. G. Minter	6,887
J. O. Richardson†	6,122

W. Johnson & Co., Ltd.,* Wandsworth:—

Tender for church tower and end gallery	£6,251	0
Separate estimates F, H, J, M, N, O, and Q	681	10
	£6,932	10

* Accepted. † Withdrawn. [Architect's estimate, £7,318.]

LONDON, S.W.—For the erection of a branch library in the Lillie Road, Fulham, for the Fulham Borough Council. Mr. Charles Botterill, A.M.I.C.E., borough surveyor:—

E. A. Roome & Co.	£7,500	0
J. Barker & Co.	6,998	0
J. Smith & Sons	6,997	0
Spencer, Santo & Co.	6,996	3
B. E. Nightingale	6,635	0
T. Bendon	6,587	0
Martin, Wells & Co.	6,440	0
Stimpson & Co.	6,380	0
H. L. Holloway	6,256	0
Foster Bros.	6,198	0
Lole & Lightfoot	5,984	5
F. G. Minter	5,891	0

LONDON, S.W.—For the erection of a postmen's office at Clapham, S.W., for the Commissioners of H.M. Works and Public Buildings:—

Jones Bros.	£5,600	0	0
General Builders, Ltd.	5,377	0	0
J. Mowlem & Co.	4,850	0	0
R. L. Tonge	4,669	0	0
W. S. Beaton	4,580	0	0
W. H. Lascelles & Co.	4,546	0	0
Holloway Bros.	4,500	0	0
J. Vicks, jun.	4,377	12	5
B. E. Nightingale	4,375	0	0
Foster Bros.	4,330	0	0
Martin, Wells & Co.	4,317	0	0
J. Garret & Son	4,265	0	0
T. Lapthorne & Co.	4,196	0	0
W. Johnson & Co., Ltd.	4,191	0	0
W. H. Lorden & Son	4,188	0	0
Wilson Bros.	4,159	0	0
W. Smith	4,157	0	0
H. L. Holloway	4,142	0	0
W. E. Keys	4,128	4	4
W. J. Renshaw	3,998	0	0
J. Appleby	3,955	0	0
H. Somerford & Son	3,939	0	0
H. Kent	3,794	0	0
Peacock Bros.	3,740	0	0
Speechley & Smith*	3,660	0	0
J. Christie†	3,500	0	0

* Accepted. † Withdrawn.

PAIGNTON (DEVON).—For alterations and additions to Primley House, for Mr. H. C. Belfield. Messrs. Bridgman & Bridgman, A.R.I.B.A. and M.S.A., architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

General constructive works.

R. Harris	£2,689	0
G. Webber	2,664	0
E. Westlake	2,652	0
C. & R. E. Drew	2,648	0
W. Lethbridge	2,639	0
H. Webber & Sons	2,615	0
Dart & Pollard*	2,602	0

Internal plumbers' work.

C. Bootyman*	209	18

Decorations.

H. Webber & Sons	195	0
Thomas & Jennings*	188	15
C. & R. E. Drew	188	10
Thomas & Son	184	0

* Accepted.

ROCHFORD (ESSEX).—For the erection of women's wards at the workhouse infirmary, Rochford, for the Guardians of Rochford Union. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend-on-Sea:—

Moss, Southend	£8,888
Band, Southend	7,500
Turner & Co., Deal	6,995
Coulson & Loftus, Cambridge	6,776
F. & E. Davey, Southend	6,546
Howard & Ruffle, Southend	6,538
McKay, Clacton	6,470
Shelbourne, Southend	6,389
Potter, Chelmsford	6,318
Harris & Rowe, Shoeburyness	6,270
Davis & Leaney, Southend	6,195
Dupont & Co., Southend	6,097
W. E. Davey, Southend	6,079
E. West,* Chelmsford	6,078

* Accepted.

SUNDOWN (SOUTHPORT).—For the erection of stables (exclusive of fittings) at Sundown, Southport, for Dr. G. H. Pollard J.P. Messrs. Todd & Morris, architects, Gresham Chambers, Lord Street, Southport:—

Chas. Rimmer	£797	0	0
Wm. Banks	778	0	0
Mark Wainwright	770	0	0
Thos. Whitehead	755	12	6
A. K. Irving & Sons	749	0	0
P. R. Morris	743	0	0
Vaughan Bros.	726	19	0
James Grierson	720	0	0
D. Wilkinson	713	15	0
Weatherill & Blanchard*	702	0	0

For Fittings.

Conns & Co., Manchester	128	0	0

* Accepted. [Rest of Southport.]

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WOLVERHAMPTON.
LONDON SHOW ROOMS:-
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Is, we believe, the Cheapest Railing in the Market.

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Adjusts itself to rises and falls in the ground and can be fixed close up to boundary.

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Both Plain and Enamelled.
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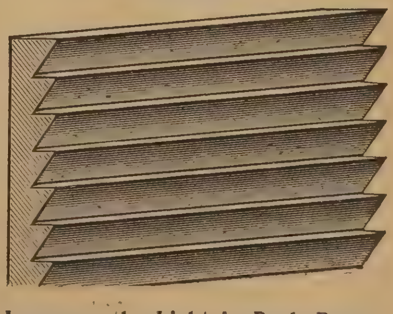

Increases the Light in Dark Rooms, Cellars, Passages, &c.
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FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	—		
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	15	0
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	7	0	1	8	7
Colza Oil, English	do.	1	7	3	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	7	6	—		
Lead, white, ground, carbonate	do.	1	4	10	—		
Do. red	do	1	0	4½	—		
Linseed Oil, barrels	do	1	12	3	1	12	6
Petroleum, American	per gal.	0	0	7	0	0	7¼
Bo. Russian	do.	0	0	6⅜	0	0	6¾
Pitch	per barrel	0	7	6	—		
Shellac, orange	per cwt.	6	10	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	9	6	1	11	6
Tar, Stockholm	per barrel	1	4	6	—		
Turpentine	per cwt.	1	6	4½	1	6	6

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	80	0	0	—		
Iron, Staffs., bar	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	10	0	11	15	0
Lead, pig, Soft Foreign	do.	11	6	3	11	7	6
Do. do. English common brands	do.	11	15	0	—		
Do. sheet, English 3lb per sq. ft. and upwards	do.	14	0	0	—		
Do. pipe	do.	14	10	0	—		
Nails, cut clasp, 3in. to 6in.	do.	6	15	0	—		
Do. floor brads	do.	9	10	0	—		
Steel, Staffs., Girders and Angles	per ton	6	0	0	6	5	0
Do. Do. Mild bars	do.	6	15	0	7	2	6
Tin, Foreign	do.	114	5	0	114	15	0
Do. English ingots	do.	116	10	0	117	10	0
Zinc, sheets, Silesian	do.	22	0	0	—		
Do. do. Vieille Montaigne	do.	22	10	0	—		
Do. Spelter	do.	16	15	0	17	2	6

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Pine, Quebec, Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	10
Do. Petersburg	per bundle	0	0	9	0	0	0½
Deals, Archangel 2nd & 1st	per P. Std.	9	10	0	14	15	10
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	0	0	—		
Do. do. 2nd „	do.	12	10	0	—		
Deals, Petersburg unstd.	per P. Std.	10	5	0	—		
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea	do.	8	5	0	16	5	0
Do. Quebec Pine, 1st	do.	27	5	0	—		
Do. do. 2nd	do.	12	15	0	13	0	0
Do. do. 3rd &c.	do.	9	10	0	—		
Do. Canadian Spruce, 1st	do.	10	10	0	11	10	0
Do. do. 3rd & 2nd	do.	6	17	6	8	15	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	5	10	6	11	5	0
Flooring Boards 1in. prepared, 1st	per square	0	11	6	—		
Do. 2nd	do.	0	10	0	—		
Do. 3rd &c.	do.	0	9	3	—		

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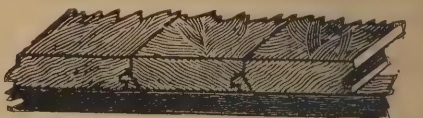
17¼ × 3 × 2	8 11	8 2	12 6
17¼ × 3 × 1½	6 10	6 3	9 6



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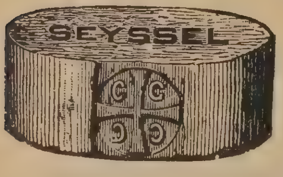

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

DEC. 4, 1901.
NO. 356.

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An Architectural Causerie.

An Opportunity for Makers. WHEN the China war was ended the boom given to manufactures in Japan was disproportionate to the available capital, and consequently there followed an inevitable depression. Happily, however, matters are now much improved; business is reviving on a far sounder basis, and the outlook is most hopeful. There is thus every expectation that the industrial exhibition to be held at Osaka in 1903 will be a great success. The point to be noted about this exhibition is that although it has hitherto been exclusively Japanese, held once every five years in different centres, it has been decided to include in the exhibition of 1903 a display of European and American manufactures and machinery, and Mr. Kanzaki, the Special Commissioner of the Japanese Government, is at present in London negotiating, among other matters, for the motive power and for a cold-storage installation. No charges will be made for space or for power, and goods for exhibition will be admitted duty free. Every inducement is thus offered to manufacturers; and when it is recollected how municipal water-supply and sanitation are now being carried out in Japan, and what extensions are being made in engineering and manufactures generally, it is to be hoped that our makers will take advantage of the opportunity, especially when the Commissioner himself states that, *cœteris paribus*, preference is almost invariably given to British manufacturers. Mr. Kanzaki can be addressed care of the "British Trade Journal," 24, Mark Lane, E.C.

The American Building. IT seems to be our nemesis to be overrun with Americans; and though, at the time when the much-vaunted architectural scheme of the London County Council was all afire, the idea of an English-American syndicate taking the whole matter in hand would have been considered incredulous and impossible, yet at the moment it is established fact. We know for certain that an application by the syndicate for the Strand site has been received at Spring Gardens, and that in due course it will be considered by the proper committee; but there seems every indication that the rough sketches published in the daily press are merely suggestive of the kind of building proposed. From the plan we note that, though the new Gaiety Theatre and Short's Restaurant are shown separated by a wide road or passage from the proposed office building, no such separation is provided at the opposite end of the island site; the result being that there is a total lack of balance, an effect which would only be aggravated by the difference in style between Mr. Runtz's building and the syndicate's great block. A passage-way with steps leading to the new crescent was shown in all the eight designs exhibited in October, 1900, at the Water-Colour Society's gallery, but they were provided at each side—an absolutely essential requirement. With regard to the English-American proposal itself, there is no reason why a most admirable building should not be built from American designs, but the Council should insist on the provision of a passage-way at each side, otherwise, no matter how good or bad the building may be, the effect will be utterly marred by the one-sidedness of the whole scheme.

City Architects. THE proposal to appoint a city architect for Manchester, which was referred to by Mr. Edward Salomons at the recent annual dinner of the Manchester Society of Architects, is not favourable in the eyes of the Lord Mayor; and as the matter is one which must necessarily concern many growing cities it is opportune to note the two standpoints adopted. Those who support the suggestion, knowing what has been perpetrated in the name of architecture by borough engineers and surveyors masquerading as architects, hold the opinion that a city like Manchester, with its constant needs for new civic buildings of one kind or another, demands the appointment of a capable man whose position will enable him to keep a progressive watch over the architecture of the city and design new buildings so that they shall form a coherent whole and not be disjointed units set among incongruous surroundings. On the other hand, the main contention of those represented by the Lord Mayor of Manchester seems to be that if a city architect is appointed the chances are that all new public buildings will drift into his hands, with the result that everything will be of one stamp, and consequently monotonous; and thus by easy stages we arrive at the plea for open competition. We cannot agree with the Lord Mayor's contention. Of course it all depends on the architect selected. If he is of the same calibre as one or two well-known theatre architects whose work seems eminently marketable, the result must be disastrous; but there is no reason to suppose that a capable architect will kill a city with monotony. Everyone must work according to his own particular views, favouring some features and abandoning others. Robert Adam built after one manner, but we should not term his work monotonous on that account, any more than we should find fault with Mr. Norman Shaw for adopting the same treatment in the White Star Offices at Liverpool as that which characterizes New Scotland Yard. Moreover, if there is one thing needed more than another in our towns and cities it is more harmony among the buildings, a defect which can only be aggravated when new additions are made by strangers ignorant of local needs and unfettered in their choice of treatment. The bizarre is to be seen on every side, and the medley of a Piccadilly Circus has its counterparts throughout the land. It is true that the presence of a single controlling hand might be too strongly felt and a city become one endless building, yet, whatever the demerits of his scheme, Haussmann made Paris what it is, and the genius of L'Enfant was largely responsible for the magnificent effects of Washington to-day: and in our own country there is the work of the Woods at Bath. So that we think the appointment of capable city architects is most desirable in every respect, but it should never be forgotten that no man can do good work when he is harassed and hurried; and when an architect has responsibilities forced on him which might well be delegated to others, when he finds himself so occupied with valuations and estimates that he has little time to think of architecture, he is not to be expected to produce his best work, though, unfortunately, many people seem to lose sight of this aspect of the question.

THE EMPIRE HOTEL, LOWESTOFT. H. L. FLORENCE AND L. H. ISAACS, FF.R.I.B.A., ARCHITECTS.

Too Generous. WE have before us the terms offered by the Birkdale Urban District Council for revising the existing plans and specifications of their cemetery chapel and lodge, superintending the work, and taking out the quantities. The cost of the chapel is not to exceed £1,200, nor the lodge £600—which makes a total of £1,800—and for all this work architects are offered a remuneration of £80, which is less than 5 per cent.; and, moreover, they are required to give a guarantee that the tenders will not exceed the amounts stated! So, all who seek such an architectural Eldorado, send ye in an application accompanied by a pencil sketch not later than December 21st: but beware the guarantee.

THE "DAVY HALL" RESTAURANT, YORK.

THE "Davy Hall" Restaurant (Messrs. Penty & Penty, architects) is situated in Davygate, York, upon a site adjacent to that formerly occupied by a building known as the "Davy Hall." Leaving the plan to show the general arrangement of rooms, it may be mentioned that the corridor by which the restaurant is approached from the street is lined at the sides with salt-glazed bricks 2½in. thick, having plinth and other dressings of local sandstone. The ceiling is groined in concrete and finished with plaster. Owing to the fact that the site is surrounded by high buildings and the necessity of keeping the dining hall and restaurant as large as possible, top lighting has been mainly utilized. The dining hall and restaurant are treated with broad effects of restful colour laid on in masses. At one end of the dining hall is a large semicircular window filled in with stained glass by Messrs. G. F. Gascoyne & Son, of Nottingham, the subject representing the knights of King Arthur's Court outside Camelot. This idea is continued in the decorative work round the wall, the stencilling on the frieze—rose and crown—being emblematic of king and country, and this, together with the stencilling in the restaurant, has been executed from the full-size cartoon of the architects. At the opposite end of the dining hall is the minstrels' gallery, with a staircase leading to it. In the framing over the fireplace underneath this gallery is a modelled figure representing King Arthur, by Mr. G. Milburn, of York, who has executed the whole of the carving in the building. Special mention should also be made of the metal work, electric light fittings and fire-grates, which are by the Bromsgrove Guild of Applied Arts.

BRICKLAYING AND TRADE-UNIONISM.

FURTHER COMMENT.

THE indictment against the building trades has passed unchallenged—simply because it is incontrovertible. There is nothing new to add to the charge, but the following additional particulars amplify and confirm the statements published in our last issue:—

The Effect of a Standard Wage.

A working joiner in the North of England thus relates (in a letter to the "Times") his experiences in the building trade:—In the first place I enter a shop as improver and am supposed to know nothing, or a little less, to start with, and after a few hours I am politely told that I must join the union or decamp. I object to certain clauses as to a standard rate of wages and other details, but, nevertheless, I am either to accept the situation or seek a "fresh shop." Circumstances are against me; I am compelled to accept the inevitable. Time passes on and a master gives me sixty doors to frame and panel; my mate on the next bench has a similar number; the amount of labour involved, the style and size are equal. Mine are sent down to the store-room at the rate of 2s. per door, while my neighbour's are costing 4s. per door. Now this is the signal for a general boycott for me. I hold to my post, and eventually I rise to take the highest post possible in the same shop, that of staircase building and handrailing, and now things assume a different aspect altogether. I am told by my shopmates that I am a fool for studying and persevering in my pursuit of knowledge, and more particularly so since that for this advanced and arduous labour (in our part) I can demand not ½d. per hour above the standard rate of wages, and the man who cannot manage even to make an ordinary frame and sash can demand the same. Now, I ask, where is there any incentive to advancement? To what purpose should I think or study for the benefit achieved? I must confess that to a man whose mind is dull and unfertilized there is none. And this cry is heard up and down the land.

Mr. William Emerson.

Mr. William Emerson, P.R.I.B.A., says:—No man can pervert and bastardize the powers and energy with which he has been endowed by working in a way which "sacrifices time, talent, labour, honour, principle and love at the altar of mammon," as seems to be encouraged by the trade-unions, without the worst moral deterioration; and as this principle appears to govern not only the building trade but most, if not all, other branches of British labour, it must affect the bulk of the working masses—in other words, the bulk of the British nation is being demoralized by means of an organised system.

The Significant Silence of the Trade-Unions.

Mr. Collison, general secretary of the National Free Labour Association, pertinently remarks in a letter to the "Times" that "although it is more than a week ago since the publication of the first article . . . . yet none of the trade-union leaders have had the courage to reply." He continues:—The restriction of work by every section of the building trade is notorious. A labourer must not "block" more than ten bricks in his hod to carry to the bricklayer—if it is ladder or scaffold work. If the bricklayer lays more bricks than the shop-delegate thinks necessary he must "stop it" or the job is "struck" and the works picketed. When the employer or travelling foreman visits a job a great show of industry is made by every branch of labour. The clink of the trowel can be heard a hundred yards off, whilst the labourers are very industriously climbing the ladders, blocking the scaffold with bricks and mortar. The talismanic word has gone around the job by the look-out delegate. It is known by the shout, "Sail-ho." When this gentleman leaves the works, the password is "Spell-ho," and the men resume their normal slow style of working. These are unwritten laws.

The Council's Bricklayers.

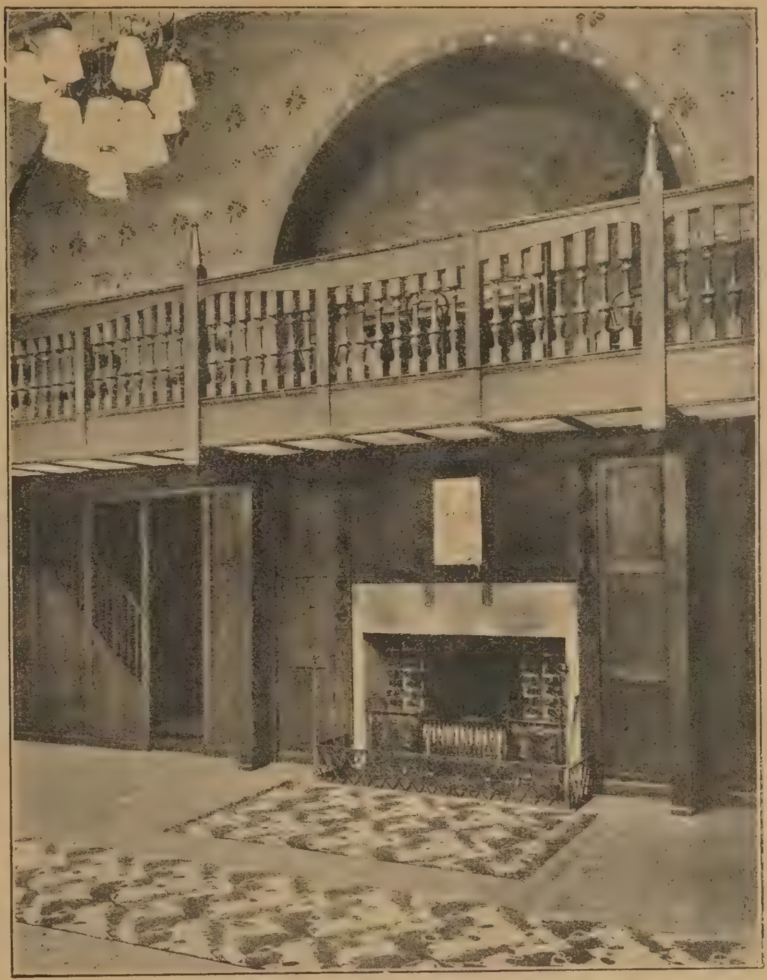
At last week's meeting of the London County Council Captain Swinton asked if the chairman of the Finance Committee had any further information to give with respect to the amount of work done by the bricklayers in the Council's employment. Lord Welby said the Works Sub-Committee had continued their enquiries, and the result confirmed the general impression that the bricklayers had done less work in recent years, but that of late an improvement had taken place. But he must add that the circumstances varied considerably in the various cases before them, and it was impossible for them at the present moment to state in any specific form what the production had been and what had been the increase of late. The Sub-Committee were still pursuing their enquiries, and would presently bring up a report. There was, however, one point which he must now notice. The "Times" correspondent stated that laying 330 bricks per day was considered a fair day's work for the London County Council. It need

THE "DAVY HALL" RESTAURANT, YORK. PENTY AND PENTY, ARCHITECTS.

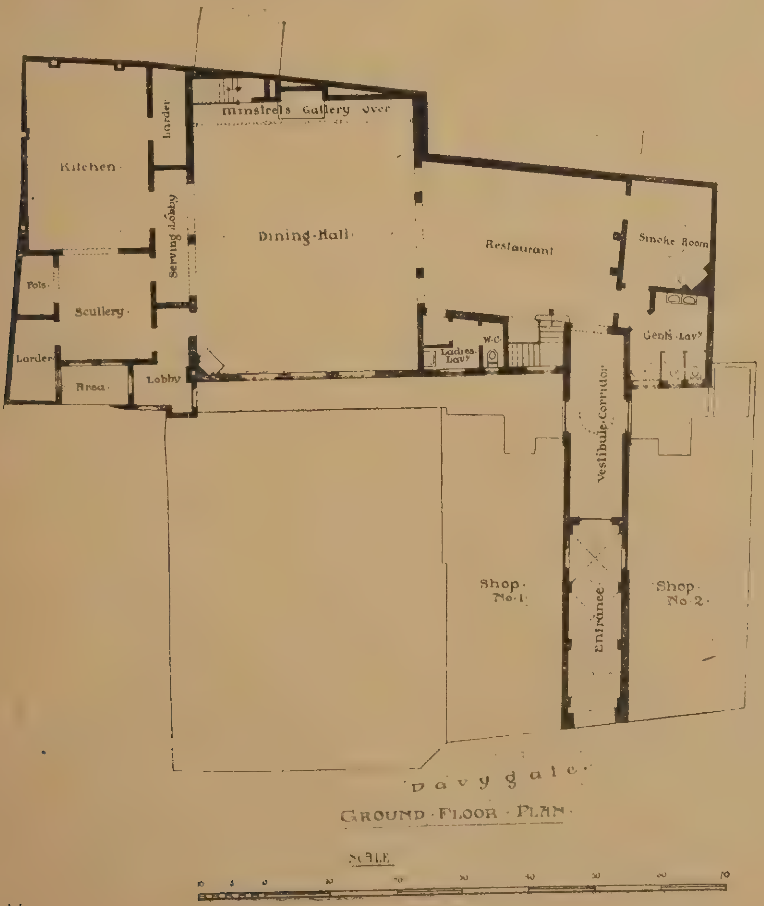
hardly be said that the Sub-Committee had never given any encouragement of any sort or kind to such a limit. The Council desired to be a model employer and to give wages which should be in accordance with those given by the best of employers; but if they gave good pay there must be some reciprocity. A good rate of pay must be rewarded by a good rate of work, and to secure that end the Works Sub-Committee would give an unwavering support to the works manager. Captain Swinton enquired whether the Sub-Committee's report would deal with other branches of labour besides bricklaying. Lord Welby said they would consider that question. Subsequently, on a report of the Fire Brigade Committee, Mr. Dobson remarked that the estimated cost of building a wall at the back of the East Greenwich Fire Station was put down at £500. He hoped that now the policy of "go easy" had been repudiated on behalf of the Works Department, and the noble lord having stated that the future policy was to be one of reciprocity, the manager of the department would insist on the latter policy being carried out by the dismissal of those men who would not give fair value for their wages. Members had denied that there was any such understanding amongst workmen as to the limitation of their production, but he could prove that it was well known all over Great Britain.

Mr. Ralph Neville Denounces the Wage System.

Mr. Ralph Neville, K.C., says:—It is hardly too much to say that work in England to-day is about as bad as an energetic, capable, and fairly honest race can make it; and it cannot be well denied that trade-unionism is, to a great extent, responsible for this unhappy state of affairs. Nevertheless it is useless to inveigh against trade-unionism. No thinking man nowadays denies the necessity of combination for the protection of labour. The British workman is what the conditions of his work have made him; you can change the man by changing the conditions, but in no other way. Exhortation and invective are popular remedies; they are certainly cheap and easy, but their effect is negligible. Give the working man sufficient interest in what he helps to produce, to make him feel that his prosperity depends upon his individual effort, and he will be speedily transformed. The perpetuation of the wage system, with the accompanying combination, as the be-all and end-all of the working man's existence means the perpetuation of improvidence, thriftlessness and inefficiency among the working class.



THE "DAVY HALL" RESTAURANT, YORK: FIREPLACE AND MINSTRELS' GALLERY IN DINING HALL. PENTY AND PENTY, ARCHITECTS.



CARPENTERS' COMPANY EXAMINATION.

THE Carpenters' Company held their annual examination in sanitary building construction recently. The preliminary course of lectures was delivered again this year with a view to helping candidates who enter to try to obtain the Company's certificate. Candidates came from distant towns, such as Nottingham, Worcester, Tunbridge Wells, &c. The board of examiners included Professors T. Roger Smith and Henry Robinson, Mr. John Slater, B.A., Mr. W. H. Seth-Smith, president of the Architectural Association, Mr. Wynter Blyth, M.O.H., Marylebone, and others. We give below the list of successful candidates, arranged in order of merit:—

1. F. Hartnoll. Special prize of books, as he has already gained the silver medal.
2. H. Barsby } Equal. Silver medal.
3. H. German }
4. G. H. Lovegrove }
5. E. W. F. Martin } Equal. Bronze medal.
6. A. Norton }
7. H. Walker }
8. H. Bolton } Equal. }
9. J. Sandham } }
10. C. W. Woodhouse } } Certificates.
11. A. B. Harvey }
12. E. A. Crane }
13. G. J. Boog }
14. J. Lawrence }
15. W. M. Couper

Architectural Association.—Owing to Mr. Francis Bond's illness, Mr. Arnold Mitchell delivered the lecture on "Capitals" before the Architectural Association on Friday evening last. Numerous lantern views were thrown on the screen in illustration of his remarks, which were given extempore.

SOCIETY OF ARCHITECTS.

MR. TREVAIL'S ADDRESS.

THE first ordinary general meeting of the Society of Architects for the session 1901–2 was held on Thursday last at St. James's Hall, Piccadilly, W., the chair being occupied by the newly-elected president, Mr. Silvanus Trevail, F.R.I.B.A., J.P. After the minutes of the last meeting had been read and confirmed, the following candidates were elected Members of the Society:—W. L. Trant Brown (London, S.W.), W. J. Dunham (Norwich), S. Arnold Kelly (Shanghai), P. S. Parris (Crowborough), H. D. Pitts (Cape Town), E. J. Sadgrove (London, W.C.), C. Simpson (Leigh), J. A. Soutter (London, E.C.) and M. Stirling (Madras). Messrs. S. C. Baggott (West Bromwich), M. B. Collins (Redruth), T. J. Edward (Ludlow) and W. C. Watkins (Southampton) were elected Students.

THE "DAVY HALL" RESTAURANT, YORK: ENTRANCE CORRIDOR.

The auditors' report for the year ending October 31st last was then read: the balance-sheet shows a balance of £350 3s. 9d. from the last account and £312 16s. 4d. from the Revenue Account.

Mr. Trevail then delivered his presidential address. After referring to architectural registration, ancient lights, the R.I.B.A. and the Architectural Association, the president spoke of the abuses of the term "architect" that come under the observation of country practitioners. He said:—

Plagiarism.

I regret to say that the local district surveyor's office in small provincial towns is frequently made the medium for plagiarism of the most impudent description. Plans and sections of new buildings have to be deposited in accordance with the provisions of the local by-laws. The local council, acting upon the recommendation of their surveyor, issue a notice that these must be in duplicate, one set to be retained by the authority and the other for stamping and return. But latterly elevations as well as plans and sections have been required, with the result that complete sets of drawings, minus the details, are in the archives of the surveyor and his batch of assistants, so that they have a complete record of all the work done in that particular town or district.

Soon we see the effect. Mr. A. builds a residence in the locality from designs furnished by a London or other distant architect of recognized standing. Afterwards Mr. B. wants a house. He likes Mr. A.'s style. When it is known locally that Mr. B. is about to build, he is visited by either the local surveyor or some member of his staff with the plausible intimation that if Mr. B. wants a residence like Mr. A.'s everything can can be done for him in the "office" much more expeditiously and better than can be the case from a distance, at a cheaper rate, and with the certainty of the plans passing the authority without revision or delay! Of course, the result is that the surveyor or his assistant gets the instruction to proceed. Such a state of things exists to an extraordinary extent in our smaller towns, and scarcely a week passes but complaint comes from one architect or another of abuses of this sort.

All local surveyors and their assistants should, as a condition of their appointment, be debarred from practising as "architects"; at any rate within the areas over which they have adjudicatory powers.

But the class I have mentioned have some knowledge of architectural work, and certainly of drainage and sanitary matters; so they have possibly more excuse for "dabbling" than Board-school masters, builders' clerks, auctioneers, land agents, general contractors, clerks of works, boys from the nearest art school, photographers, highway surveyors, and in one instance a marine store dealer—all of whom, to my knowledge, have signed themselves "architects," submitted plans to local authorities, and otherwise acted as professional advisers to their clients.

Registration: The Illinois Precedent.

(Here the president dealt at length with architectural registration, citing the case of Illinois, of which Professor Clifford Ricker, president of the State Board of Examiners, said: "The general results of the law (registration) have been decidedly advantageous to the public as well as to the profession. The professional education and training necessary to the successful practice of architecture has very materially increased during the existence of the law. Nearly one-sixth of the number of architects licensed without examination have been replaced by men who passed the examinations now required. Since this change has occurred within three-and-a-half years, it may reasonably be expected that all incompetent men will have left the profession at the end of the next ten years, when all practising architects will either have passed the examinations or possess equal preparation for their work. The professional standing of the architect should then, in Illinois, equal that of the lawyer or the physician.")

A Proposal in regard to Ancient Lights.

Mr. Trevail next spoke of ancient lights, stating that what was wanted was "a preliminary court of appeal in each locality, where plans can be deposited when any improvement is contemplated likely at all to affect others. Those who may adjoin should have notice of what was intended and the full right of inspection of plans, and the pros and cons should then be gone into fully; and if, in the opinion of the Court, damage was likely to be sustained, they might say so with or without assessing it, as might be agreed to on both sides, but at any rate to have the power of giving a permit for proceeding with the work if the damage in their opinion was not such as to materially affect the user of the complainant's premises, when the subject of actual damage sustained could be subsequently ascertained by arbitration or in the law court in the usual way. This at least would release properties from the state of absolute block that many are in to-day."

Five per Cent.

Continuing, Mr. Trevail said:—Not long ago a gentleman, who as a member of many building committees has had a great deal to do with different architects, told me that he was astonished to find such a great variation as existed among architects as to what services should be rendered for the ordinary commission of 5 per cent. He remarked that if there was a clear and definite statement upon the matter it would be of great advantage to the profession as well as to the public. Now, I take it that we as a body do not want to be told what is included in our ordinary fee of 5 per cent.; but as there are others outside who would like to know, and seeing that anything that will conduce to uniformity of practice is a distinct advantage I will take upon myself to define the duties concisely as follows as coming within the ordinary commission:—(1) Reasonable preliminary sketches in pencil, revised until the wishes of the client are exactly ascertained. (2) Approximate estimate of cost, such as may be obtained by cubing. (3) Preparation of a full set of ⅛in. scale drawings complete in all respects, with one traced copy of the same for the builder's use in carrying out the works. (4) A complete detailed specification with conditions of contract, and in duplicate, one copy being for the builder's use. (5) Advertising and obtaining tenders for the work if let by public contract. (6) Complete details, sufficient for the ordinary workman in each trade to execute his portion of the building. This would mean ¼in. or ½in. scale drawings of the better class of work that might differ, and half- and full-size sections of all mouldings and the more delicate parts, and that full and explicit instructions for the proper execution of the work should be given in all cases. (7) Personal supervision by the architect or his deputy should generally be made monthly, or say once in six weeks, dependent upon the size of the buildings. For all other services, such as extra copies of the plans for local authorities, for taking out quantities, surveys of site, arrangements with adjoining owners, travelling or other out-of-pocket expenses, the architect is entitled to charge separately.

I have made this statement for the benefit not only of my querist of the building committees, but also of architects who sometimes come across very exacting clients who not only want a £4,000 job done for half the money, but will put an architect to the trouble of drawing and re-drawing until it is brought back bit by bit to the point where he has probably been told at the start that could not be exceeded for the proposed expenditure.

On the other hand, I have heard of architects—and some of them whose work has been hung in the Royal Academy—being content to supply builders with the flimsiest plans to ⅛in. scale, partly drawn, some portions to scale and others not, with no specification, no detail drawings, and then expecting their 5 per cent., which I maintain is not fair to the public nor to their professional brethren, as it tends to bring architects and their work into disrepute. And, in the question of personal supervision, I have heard of cases of really large works of a national character where the architect has been seen on them only at intervals of six months.

To merit the public confidence we must, as architects, show ourselves to be worthy of it by our actions, and I think that perhaps, after all, it is well occasionally to recognise what our duties are, because, though the ninety-nine members of our profession may go perfectly right and the single one may not, we hear more of that solitary case than of all the others put together.

The president afterwards spoke of Metropolitan improvements, comparing London with other cities, and concluded his address by references to the tenure of building sites and the prospects of the profession.

In the course of the evening it was announced that the Gold Medal of the Society had been voted to Mr. Walter Emden in recognition of his four years' service as president.

The New Public Dispensary for Leeds is to be erected from designs of Messrs. Bedford & Kitson, architects, of Leeds, in Hartley Hill, North Street.

Law Cases.

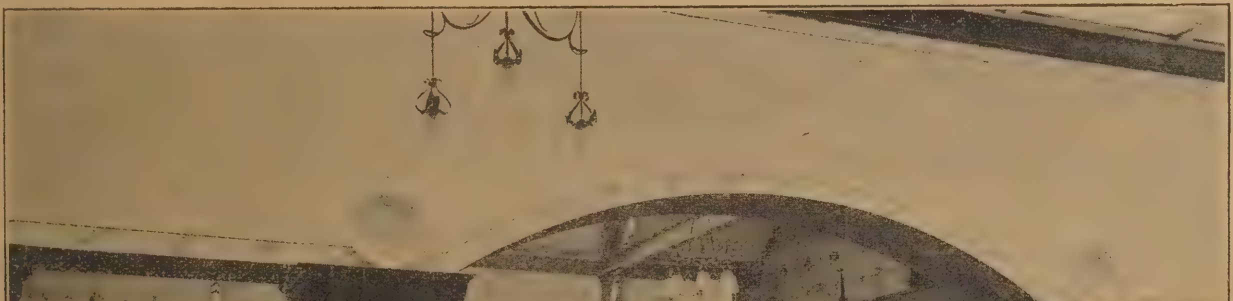
Cost of Window-Frames and Sashes.—At Colchester County Court an action was recently heard in which Mr. H. J. Linzell, builder and contractor, of Newmarket, sued Mr. Coleman, builder, of Clacton-on-Sea, to recover £45 10s. 9d. for window-sashes and frames and other work supplied, an amount based on a charge of 1s. per ft. super. Defendant paid into court £11 2s. 9d. of the amount, which was admitted, but in respect to a claim of £34 18s. for the sashes and frames he admitted £18 only, based on a calculation of 6½d. per ft., which he contended was a fair charge. Defendant counter-claimed for loss alleged to have been sustained through delay in the delivery of the sashes, and the fact that when delivered they did not fit. Mr. T. A. Cressy, architect and surveyor, of Clacton, thought a fair charge for the sashes supplied by the plaintiff would be 7d. per ft. His Honour Judge Tindal Atkinson gave judgment for the plaintiff for £26 2s. 4d. on the basis of 10d. per ft., with deduction on defendant's counter-claim.

Re W. H. Gibbs.—A first meeting of creditors was held in the Court of Bankruptcy on Wednesday last. The debtor traded as a builder at 5, West Kensington Terrace, W., under the style of W. H. Gibbs & Co., and the receiving order against his estate was made upon the petition of the Queen's Club Gardens Estates, Ltd. He stated that ten years ago he was worth about £10,000, and he then embarked on extensive building operations at Kensington, the transactions being carried through by a firm of solicitors. About August, 1898, a company—the Queen's Club Gardens Estates, Ltd.—was formed to take over the property from the debtor, the purchase price being £490,000, of which £390,000 was paid in cash, and the debtor took £100,000 in Ordinary shares. He stated that foreclosure proceedings on the part of mortgagees had affected the whole of his assets, and he attributed his failure to the stoppage of finances, heavy law and other expenses, and to ill-health. Proofs amounting to about £24,000 were lodged, and the debtor consented to an adjudication.

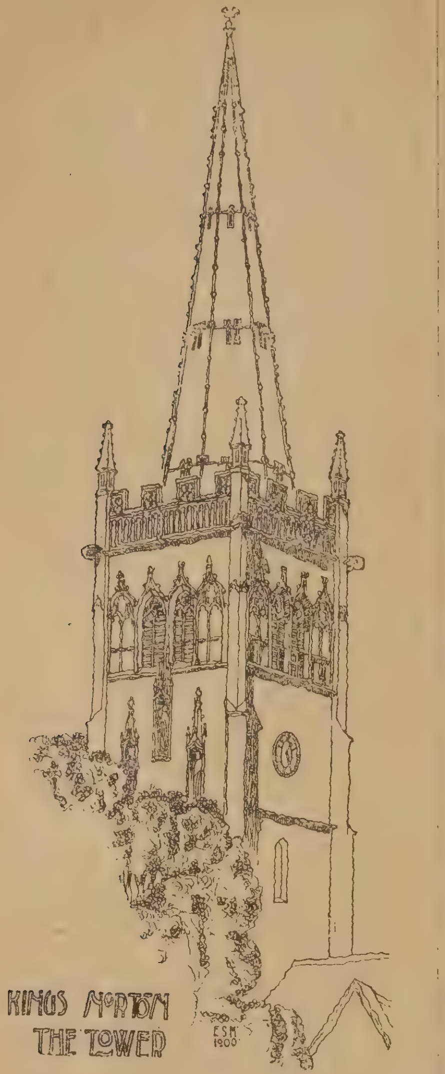
Non-Compliance with Sanitary Order.—At the North London Police Court last Wednesday Elizabeth Salt, the owner of several houses in Allen Road, South Hornsey, was summoned for a penalty for non-compliance with an order calling upon her to do certain sanitary work. She contended that it was impossible for her to do the work, as the main drainage was defective. Mr. Kennedy said that the defendant had rendered herself liable to a penalty of £130. He fined her £20 and costs, and recommended her to do the work at once.

The L.B.A. and Pipe-Fixing.—At the North London Police Court recently Messrs. Aiton & Co., steam-pipe fitters, of Western Works, Hythe Road, Willesden Junction, were summoned for doing certain work at the Hackney Electric Lighting Station without giving notice to the district surveyor, as required by the London Building Act, 1894. Mr. Meeson (the surveyor) said he found a 12in. steam pipe, tapering to 9in., with 6in. connections. The pipes were brought to the works and fixed by the defendants, and he submitted that that brought the matter within his purview. In defence Mr. Romain said that his clients were simply contractors for the fixing of the pipes. They had nothing to do with the structure. The builders made the holes in the walls and dug the trenches, all that was necessary for the defendants to do being to fix the pipes. He submitted that they did not come under section 145, which only applied to buildings. Mr. Fordham said he thought the fixing of steam pipes would come within the Act, but, on the other hand, as Mr. Romain had very clearly shown, the district surveyor had overlooked the fact that with regard to this special building it was exempt. He dismissed the summons with £1 1s. costs.

The Government Architect and Workmen's Wages.—At the Thames Police Court recently a number



THE "DAVY HALL" RESTAURANT, YORK: VIEW OF DINING HALL AND MINSTRELS' GALLERY. PENTY AND PENTY, ARCHITECTS.



of men who stated they were painters asked Mr. Mead's advice under the following circumstances. They had been working for a Government contractor at the Tower of London, and were paid at the rate of 7d. an hour. A short time ago the Government architect came round and on finding out what they were paid, said the contractor was under an obligation to pay them at the rate of 8½d. an hour. The contractor paid them at the rate of 8½d. for that day, and discharged them. Mr. Mead observed the architect had no right to regulate the rate of wages, and the men were only entitled to receive what they agreed to work for. He failed to see what the men had to complain about in getting 1½d. an hour more than they had previously received.

A Case affecting Underground Conveniences.—In the Chancery Division of the High Court of Justice judgment was recently delivered in the case of the *London and North-Western Railway Co.* v. *Mayor, &c., of Westminster*. The plaintiff company in 1886 purchased some houses in Parliament Street and Bridge Street, Westminster, which had vaults projecting beyond the boundary line of the premises. In June, 1899, the footway was 12ft. 9in. wide, but in that year certain blocks of buildings in Parliament Street, opposite the plaintiffs' premises, were removed and the footway widened to 21ft. The defendants decided to construct conveniences under Parliament Street, with descents from the footway on either side of the road, which descents, it was said, interfered with the plaintiffs' rights. Mr. Justice Joyce held that the construction of the defendants' works was in no way *ultra vires* or unreasonable. With regard to the plaintiffs' case as to soil line, the soil to the centre of the road could not be the plaintiffs'. In making the staircase, however, the defendants had taken 2ft. 9in. of the plaintiffs' soil, and he made an order for the removal of that part of the staircase which was on the plaintiffs' land. He made no order as to costs.

HARBOUR CONSTRUCTION.

The Effect of Sea-Water on Portland Cement.

IN the course of a paper on "Harbour Construction," read before a recent meeting of the Aberdeen Association of Civil Engineers, Mr. James Barron, C.E., said that a very large part of all harbour works was the erection of walls. Possibly no subject existed about which there was such a lack of experimental data as on the lateral pressure on walls. In the case of sea walls the question of vibration by shock from a wave and its sudden withdrawal exercised an effect which was not easy to determine, and engineers had to exercise their own judgment. They found dock and quay walls ranging in thickness at the base to 50 per cent. of their height, and in some cases 25ft. of base per 40ft. of height had been found necessary. The rule which had been generally followed was to make the thickness at the base one-third of the height and half-way up one-fourth, but a good deal depended on the nature of the foundation, the suitability of materials used for backing, and on the exposure to the force of the sea.

In regard to the materials of construction and the form of quays and piers, he said that latterly changes had taken place regarding the description of materials, due in large measure to the introduction of iron and steel, and particularly to concrete made with Portland cement. The possibilities of concrete as a material for construction were remarkable. The other day he saw being manufactured at Southampton Docks piles 60ft. long, with a cross-section of 14in. by 14in., and he was informed that they could be handled and driven as successfully as timber piles.

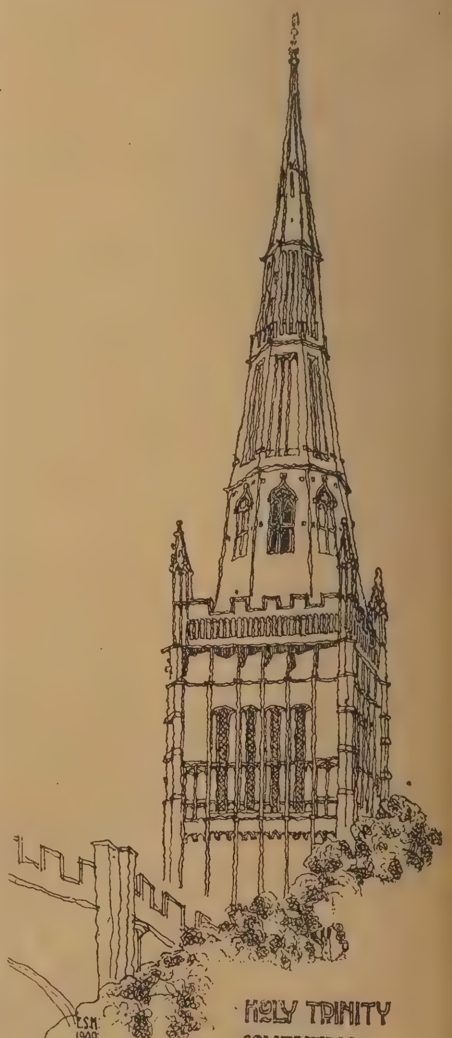
The materials chiefly used in sea works for harbours such as he described were stone, cement, concrete and timber. Where stones were abundant and of sufficient size, and could be obtained at a reasonable cost, it was often expedient to use them in preference to concrete. They were more durable, and stood wear and tear better. Cement-concrete was now found to be the most suitable material for the construction of harbour works in the open sea. The chemical properties of Portland cement were now better understood; and notwithstanding the recent scare about chemical action on cement-concrete in the sea, engineers were finding that by using the best quality of cement and regulating and adjusting the aggregates of concrete to meet the various requirements of the work satisfactory results were obtained. Referring to timber as a means of harbour construction, Mr. Barron said that it was specially adapted for piers and quays placed in sheltered bays or rivers, and, as a rule, it would be found to be cheaper than either stone or concrete, particularly if the work was on soft ground and in deep water. The kinds of timber chiefly used were pitch-pine and greenheart; the latter, although somewhat costly, should be used in salt water, as it was the better able to resist the ravages of that destructive worm, the teredo. He had occasion recently to examine a number of piers which he constructed twenty years ago, and found that the greenheart timber was as sound as when erected. Creosoted pitch-pine was often used for work above high-water level.

In the discussion which followed the reading of the paper, Mr. R. G. Nicol, C.E., Harbour Engineer of Aberdeen, observed that the great thing in using concrete was to see that plenty of cement was put into it. In the past engineers got to be very daring, and reduced the quantity of cement more and more. Suddenly all over the country failures took place. They would hardly believe it if he told them the number of works that were in ruins and which were constructed a few years ago. One thing he would always like to see in breakwaters—that was the cement faced. He pointed out that in the case of the Aberdeen pier, which was faced with granite 18in. thick, the battering that it received had reduced this facing to half its original thickness. They might judge what the effect would have been had the softer cement been exposed. Mr. Nicol then proceeded to explain how concrete was laid in position in bags perfectly dry. The mass was mixed up and enclosed in its covering and then sunk. Their experience of this method at the Victoria Dock had been most satisfactory. The mass became thoroughly impregnated right to the centre, and was more solid than that made up before being placed in position. How such a system would do with very large masses he could not say, as he had not tried it, but they were to increase the size of the bags in the future.

After a few remarks by the secretary, Mr. Barron, in reply, said with regard to the action of the sea on concrete he thought it was the general experience that if there was enough cement in the concrete there was no danger.

TWO CHURCHES.

THE following notes accompany the sketches on this page by Mr. E. Stanley Mitton:—King's Norton Church is a fine example of Perpendicular work, and is greatly admired for its graceful and remarkably fine spire, which is crocketed and has canopied windows. The nave has no clearstory windows, but has some Decorated insertions. The school-house which adjoins is a fine specimen of half-timber work, and is one of the many charming fragments of architecture to be found round about Warwickshire: it was erected in the sixteenth century, and contains a very fine library of 700 volumes, given in the reign of Charles II. by Thomas Hall.—Holy Trinity, Coventry, suffers somewhat in effect from its too close proximity to St Michael's. The spire rises to a height of 237ft., while St. Michael's rises 303ft. The original spire was unfortunately blown down in 1664, and caused considerable damage to the body of the church. The ancient pulpit is probably one of the finest to be found around, or, as some say, not to be surpassed in the kingdom. Dugdale says that the first mention of the church is in the forty-fourth year of Henry III.—that is, in 1260.



Bricks and Mortar.

APHORISM FOR THE WEEK.

An architectural object pleases the eye when its leading parts are so arranged that the attention is successively and correlatively struck by the most essential down to the least important feature.—PROFESSOR DONALDSON.

Our Plates. THE little chapel of the Brompton Consumption Hospital was erected and consecrated in the year 1850. It is picturesquely situated in a corner of the grounds of the old hospital in Fulham Road, sheltered by many trees, and hardly visible from the road. A covered corridor with tower and record room affords communication with the main block of the hospital. The cost was £2,500, out of which sum £250 was spent on the oak fittings, choir stalls, &c. There is a sedilia in the chancel on the right, and credence on the left, and most of the windows are filled with stained glass (the latter, with the exception of a new window, is however poor, and was not in the original contract). The architect of the original form of the chapel was the late Mr. E. B. Lamb, F.R.I.B.A. The drawing is by his son, Mr. E. B. Lamb, architect, of 31, Craven Street, Charing Cross, W.C., and was made before the enlargement by the late William White, F.S.A,

Church Crafts. THE CHURCH CRAFTS LEAGUE held its second annual meeting last Thursday at London House, 32, St. James' Square, S.W. The Lord Bishop of Rochester, who was in the chair, in moving the adoption of the annual report, said the membership had been doubled both amongst the artists and the ordinary members, and the work done through the League had increased proportionately. The applications received for advice during the year had numbered 91, and in every case this had been given free of all cost to the enquirer. Work had already been placed in twenty-six churches, while a large number of schemes were in progress and would come into next year's statistics. The Committee had also taken in hand the compilation of a book of simple designs for churchyard monuments, with suggestions for the use of clergy as to the protection of churchyards from disfigurement, and it was hoped that this might help considerably towards a much-needed reform. Mr. T. Stirling Lee seconded the adoption of the report. The Bishop of Rochester was then re-elected president. The election of three ordinary and three artist members of the committee, to fill the places of those retiring under the rules of the League, resulted in Canon Rhodes Bristow, Dr. F. D. Drewitt, Mr. J. T. Micklethwaite, F.S.A., Mr. R. Anning Bell, Mr. T. Stirling Lee, Mr. C. O. Skilbeck, being elected, while Mr. T. Dyer Edwardes was elected treasurer for the ensuing year. An election of artist members followed, the successful candidates being Mr. Robert Marchant, architect, Mr. Robert Hilton, metalworker, Mr. Jasper Brett, glass-worker, Mr. Hilyard Swinstead, painter, and Mr. John T. Seddon, architect.

Alfred Stevens. MR. J. ATWOOD SLATER, speaking at a recent meeting of the Bristol Society of Architects, when a paper on Alfred Stevens was read by Mr. John Fisher, said: I have for much time dispassionately held that Alfred Stevens, with Turner, were the first artists that England produced from the middle of the eighteenth to that of the nineteenth centuries; and that, compared with the great oracles of the past, he reasonably approaches Michael Angelo, whom he unquestionably touches and sometimes surpasses. I think that there is evident, in carefully examining the figures upon the Wellington Monument and the Dorchester House chimneypiece, a finer knowledge of line in Stevens's work. Michael Angelo's Medici figures, and, indeed, his other famous works, are not so unequivocably good; the effigies superimposing the sarcophagi are, for brief instance, "pillowy," though they may be more anatomic. The suavity of nature's hypo-refined grace is not traceable in their easy posture. The fact is that they pose for something, generally their own animal idiosyncracy, if not respectable vanity. Stevens's figures always, on the contrary, pose for their own decency, which throws into the core, the heart of the monument, such an expression of beauty, giving rise to the word innate, quenching the sense of frivolity, which unrestrained disordered state of things oozes out somewhere, or is at any rate felt "in the air" in Michael Angelo's works. Stevens's head was wonderfully poised on his own "torso" to know and feel this with such thrilling, vital, consistent certainty. You catch awhile his lovely idea in the strong fragrant symmetry permeating his work. The iron soul of the man implants his lines of strength far inside the actual bounds of the visible crust, and the mind of the idea expanding naturally is caught at the salient "processes" in curves and features, betokening nothing that touches but grace. I should mention that there is one fact which describes minutely my veneration for Stevens's work at its best, perhaps its fullest; whereby I mean that inspection of his intellectual labour has always restored to me the time so wisely occupied in regarding it, proving that there is goodness, virtue, essence in it past all fellowship with ephemeral things. There is a true, not a laconic, logical and prophetic inference in it that is appropriately styled "time," the finest embodiment of musical equipose, felt to a "tick"; no faltering, barbaric or false quantities, but a sustained and equable, uniform tone of chromatic measure, meted out as by a mind imbued by but sacrificing the scale of colour to its own actual achieved end.

Housebreaking by Dynamite. EGREMONT HOUSE, about half a mile [from Silverton, stands on an acre of ground. It has 150 rooms, and has been unoccupied for more than forty years. It was built sixty years ago by Lord Egremont, who only occupied it for about four years, when he died without seeing the completion of the undertaking. To complete the structure a fortune would have had to be spent, and as a result it has fallen into the hands of Messrs. Atkins & Taylor, of Exeter, who are demolishing it and making what money they can of the materials. Large marble mantelpieces have fetched nearly £50 each. Messrs. Atkins & Taylor recently blew up the whole of the front of the house by dynamite. Three successive charges were exploded, and the experiment was successful, nearly the whole of the front being brought down.

Mr. Haité on Decoration. UNDER the auspices of the northern district of the Incorporated Institute of British Decorators, Mr. George C. Haité delivered a lecture at Sheffield on November 28th, the subject being "Decoration and Decorators: A Survey of the Past and Present." Mr. Haité dealt chiefly with the domestic aspect of decoration, referring to it as the art which surrounds us during the most impressionable period of our lives—the days and hours of childhood. Its character, therefore, was of supreme importance. The influence for good or bad which it exerted was much stronger than was generally imagined, and in his opinion every nursery should be decorated in such a manner as would tend to educate and elevate the infant mind. Decoration was, moreover, the only undying evidence of national life and thought, and he held it to be one of the most important of the arts. He briefly traced the past history of decorative art and pointed out that until quite recently decoration had been a luxury only obtainable by the rich. Since the introduction of wallpaper, however, it had become accessible to the people, and he thought that there was no longer an excuse for anyone failing to secure an artistically-decorated home if he desired it. In domestic decoration our advantages were far in advance of our French neighbours, and in support of this contention he quoted the opinion of a most eminent French decorative artist and critic, expressed in a letter to the lecturer. Decoration was at its lowest ebb, perhaps, at the beginning of the last century, but after the great Exhibition of 1851 a change became manifest. A few leading architects with the feeling and faculty of design took action, and he dated the general improvement from the time when Wyatt, Godwin, Talbot and others, designed better wallpapers, and, with the aid of enlightened manufacturers, produced them. Decoration was not yet, however, what it ought to be. His first note of complaint was that the spirit of the age was "Humbug." It was undoubtedly the dominant feature of every phase of life to-day; found in politics, in literature, and, more than anywhere else, in art. He pointed out that some exponents of what is called "Fine Art" assert that there are no laws, no general principles, to govern art-expression: but this was wrong. The great principle which applied to all art-expression was "fitness." Let the expression of art be of our own time, and our own faith, accepting and content only with the best to be had; and rendering it capable of bearing the tests of logical reasoning. Exceptional opportunities for the decoration of public buildings and palaces were few. In a humbler way, however, in domestic decoration, problems occurred that called for all the judgment, experience and originality of the decorator. Substitutes for hand work were now supplied most plentifully, and in the right choice and use of these materials the decorator of to-day had great scope for the display of individuality and skill. It was no use inveighing against the use of these materials, for they were an evidence of the times, and many of them of great excellence. In fact, the manufacturer had outstripped the decorator. He had supplied media, artistic in form and colour, at a price possible for all; and it was for the decorator to apply these with skill, taste and judgment. Some people contended that decoration was decadent, but if such were the case it was because of the commercialism imported into its practice by the huge combinations of decoration with other trades. In conclusion he urged that decorative art was a necessity in the progress of civilization, and should therefore be educational; that manufactured goods were not essentially antagonistic to the art of the decorator; that it was desirable that the art of the decorator should be kept apart from other trades, instead of being undertaken by linen-drapers and furnishing firms. He submitted as a scheme that the decorators of the country should appoint a council, through this Institute, to organize an exhibition of decorated rooms in London to be kept open, say, for three months, and that afterwards it might be sent to the larger provincial centres. He thought such an exhibition would go far to abolish what he designated as the "Tottenham Court Road" school.

A Glasgow Workmen's Lodgings. ON Saturday, November 23rd, the members of the Glasgow Technical College Architectural Craftsmen's Society visited the model lodging for men known as Whitehouse, situated at Springburn. The promoters are a syndicate under the name of "The St. Mungo Boarding House Company." The idea of the management is not so much to cater for the single-night lodgers as to provide for permanent or weekly boarders. For the sum of thirteen shillings and sixpence per week a working man has his breakfast, dinner, tea and supper served in a dining-room large, airy and well lit, on tables laid with spotless tablecloths, and waited on by attendants. There is a library, recreation- and billiard-rooms. Each bedroom is provided with a wardrobe, chair and chest of drawers, in addition to a bed upon which is not placed the inevitable black-and-red bed mat, white taking the place of the black. The architect is Mr. Whitey, of Glasgow. The walls are constructed of brick, rough-cast cement on face, with red tinted cement as dressings. The floors are fireproof, and the buildings are lighted throughout by electric light. Steam is employed in the cooking arrangements, and the laundry work and cleansing is accomplished by the most improved machinery. In addition to the hotel proper, with its adjuncts, there is provided a shooting range.

"A Bricklayer's Lay."—The following is the original of the "Globe's" recent skit—it was published in "Judy" more than thirty years ago, and was styled "The Working Man's Toast":—

Eight hours' work, eight hours' play,
Eight hours' sleep, eight bob a day.
'Ate 'ard work, 'ate hupper ten,
'Ate all Tories, 'ate "Old Ben."

("Old Ben" is Lord Beaconsfield, of course.)

Views & Reviews.

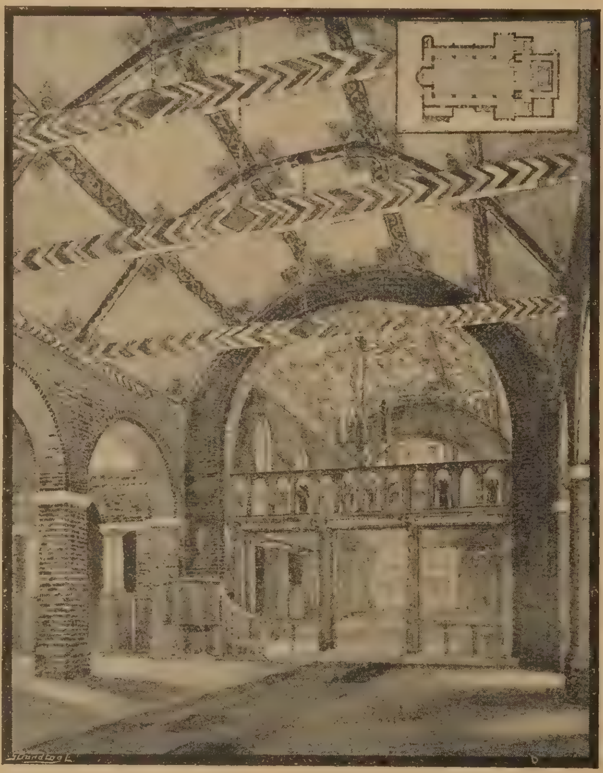
The Improvement of Towns and Cities.

Mr. Robinson is an American who is (apparently) familiar with our own country and with Europe in general, and his object is "not to give an exhaustive discussion of the subject of improvement of towns and cities, but to review the whole broad field of modern effort; to pick out the salient points, to declare the best that has been done along every line, and to encourage further effort by showing the progress attainable because somewhere attained." He could have no better object; for the dreamers and the talkers, the idealists and the socialists, and all the rest, have had their say, and albeit we are now in danger of being surfeited by them. The generalisations of Paris and London, as compared together, have been harped upon till we go in fear and trembling of every presidential address, and it is pleasant therefore to turn to the actual results and to find them gathered under different sections, analysed, and criticised in a common-sense manner. For instance, in the section of this book which deals with the planning of streets the author does not waste himself on visionary improvements, which, however desirable, are never likely to be carried out, but explains the three types of plan in general use—the gridiron plan, which offers the maximum area for building sites "and a regularity of almost childish simplicity" (like Washington or New York); the diagonal plan in which avenues afford economy of communication, vistas of much beauty, and open squares and spaces that are grateful to the eye and of considerable sanitary value (as in Paris); or the ring plan, the most noted example of which is seen in Vienna, with the famous Ringstrasse within and Gürtel-strasse (girdle street) without. The author goes into the details of all these plans and so makes his matter of real interest and value. He adopts the same method in regard to street-cleaning and paving, lighting, subways, smoke-prevention, advertisement abuses, parks, the placing of sculpture, architectural obligations, popular education in art, and the work of officials. In dealing with buildings that crown an eminence he insists that they shall be white and pure. "So rose the Acropolis over Athens, and the opposing temples of Jupiter and Juno on the twin heights of the Capitoline hill over the Rome of the Emperors. It is no dream. A dozen modern structures carry out the idea. Build them of dark material and they must glower heavily over the city; build them of white marble, in chaste design, and their beauty is not incongruous in the ugliest industrial city." A matter which offers many curiosities is the nomenclature of streets. The numerical and alphabetical names of New York, Chicago and Washington are hopelessly prosaic, being somewhat akin to the numbering of convicts in large prisons; "Main Street" as the title of a leading thoroughfare exhibits but feeble wit, yet the Paris example of the Rue du Quatre Septembre is little more commendable; and sometimes the search leads one to such quaint abstractions as those in New Orleans—Virtue, Law, Industry and Pleasure as street names, even to the sufferance of Goodchildren Street! So it behoves us to look well to our street names. The author is not a lover of the tall building, which he asserts æsthetically demands broader streets and open spaces: in Paris the maximum height of facades is fixed at 65½ft., in Rome it is 78½ft., in London 80ft., and thus the increase goes to 125ft. in New York and 130ft. in Chicago, changing thoroughfares into sunless chasms. The book sets forth what has been *done* for the improvement of towns and cities; and as an index of its thoroughness it is sufficient to note that three pages are occupied by the names of societies and organisations whose efforts and aims in different cities have been considered.

"The Improvement of Towns and Cities, or the Practical Basis of Civic Æsthetics." By Charles Mulford, Robinson. New York and London: G. P. Putnam's Sons. The Knickerbocker Press. Price 5s. nett.

Buddhist Art in India.

Professor Albert Grünwedel's handbook on "Buddhistische Kunst in Indien" was a considerable contribution to the knowledge of Indian Buddhist sculpture, and it is to be regretted that this English translation has been so badly done that it is wearisome to read it. All the clearness of the original has been lost and one's brain is kept always on the rack, a fault common to the literal translation of German. With Mr. James Burgess, late Director-General of the Archæological Survey of India, to revise it, involved English was not expected. The chief value of Dr. Grünwedel's work is in the classification and comparative analysis of the widely-diffused and chaotically-arranged specimens of Buddhist sculpture in the museums of India and Europe, specimens mostly collected haphazard without proper records being kept of them. The author's criticisms of Buddhist art will not be acceptable to many persons, and (like many archæologists) he lays too great stress on the chance resemblances of ordinary forms of design to argue their derivations.



CAMBERLEY CATHOLIC CHURCH, SURREY.
C. H. B. QUENNELL, ARCHITECT.

"Buddhist Art in India." Translated from the "Handbuch" of Prof. Albert Grünwedel by Agnes C. Gibson, revised and enlarged by James Burgess, C.I.E., LL.D., F.R.S.E. London: Bernard Quaritch.

Statics.

This is a very able elementary treatise on the statics of co-planar forces, and we can recommend it as a text-book for building construction and engineering students. The special feature of the book is the continual insistence upon the double aspect of the subject—the geometrical and the analytical. The advantage of this treatment need hardly be pointed out, for it brings the correlation of geometry and analysis into constant prominence. The illustrations are admirably clear, a point of much value in these days of cheap and bad reproductive processes.

"A Treatise on Elementary Statics for the use of Schools and Colleges," by W. J. Dobbs, M.A. London: Adam & Charles Black, Soho Square, W. Price 7s. 6d.

MANCHESTER FIRE-STATION COMPETITION.

LAST week the twenty-five sets of designs for the new fire- and police-station to be erected in London Road, Whitworth Street and Fairfield Street, Manchester, were publicly exhibited at the Town Hall. Mr. T. Worthington, F.R.I.B.A., of Manchester, was the assessor appointed by the Watch Committee. The first premium of £300 has been awarded to Messrs. Woodhouse & Willoughby, of Manchester, with Mr. John Langham, also of Manchester, as joint architects. The second premium of £200 has been awarded to Mr. G. Watson, of Edinburgh; and the third, of £100, to Messrs. Mangnall & Littlewood, of London. The site (which is triangular) will be mainly occupied by the new fire-station, the police and ambulance stations being only a small adjunct. The first premiated plans provide very comprehensive accommodation for an efficient fire brigade. The front elevations show a free treatment of the English Renaissance of the eighteenth century, and will be executed in Ruabon red brick with buff terra-cotta dressings. The frontage to the London Road is 260ft., to Fairfield Street 328ft. 6in., and to Whitworth Street 234ft.; the Commerce Street corner is 97ft. 3in. The buildings generally consist of ground floor and three storeys. The fire-station will provide space for eight fire engines, the room being 182ft. by 33ft. with eight doors to the front, the horses being stabled at the right and left rear of each. On the ground floor at the corner of London Road and Fairfield Street premises suitable for a branch bank are provided. Adjoining this in London Road the plan provides for a branch public library occupying the ground floor and basement. Above the bank, with a private entrance from Fairfield Street, the chief officer's residence is arranged for occupying the first and second floors. The second officer's quarters will be at the corner of Fairfield and Commerce Streets. The third officer's quarters are approached from the main chief staircase, and are over the offices. The other firemen's tenements occupy the first, second and third floors in London Road, with the exception of space allowed for a roomy gymnasium. This is to occupy the corner of Whitworth Street and London Road. It will embrace the ground and first floors, the area being 100ft. by 33ft., and it will have a gallery around at the first-floor level. Below in the basement will be a spacious plunge bath with all conveniences. Above the gymnasium is space for stores, and on the top floor are the laundries. In the drill yard will be a drill balcony 80ft. high, for the purpose of drilling with the big escapes. In Whitworth Street the buildings comprise loose boxes, sick-horse stables, harness-room, &c. The total estmated cost of the buildings, including the Gamwell electric installation, will be £85,000. The site cost £22,000, so that when completed the work will entail a total cost of about £110,000.

Camberley Catholic Church, Surrey. — This church, by Mr. C. H. B. Quennell, is being erected in the main London Road near the entrance to the Staff College. The seating accommodation is for 364, including the western gallery. As to materials, the brickwork, where shown, is in T.L.B. red facings, with panelled wood dado all round the church. The roof it ceiled in plaster, and Mr. Paul Woodroffe is responsible for the decorations and glass. Externally, the elevations are very simply treated. The walls are faced with T.L.B. red facings, all detail being in brick; windows in wrought-iron, roof covered with red tiles and oak shingles to a bell turret. The lowest estimate was from Mr. E. C. Hughes, builder, of Wokingham, for £3,100, which included ventilation and heating, pulpit, &c., but not internal decoration or seating.

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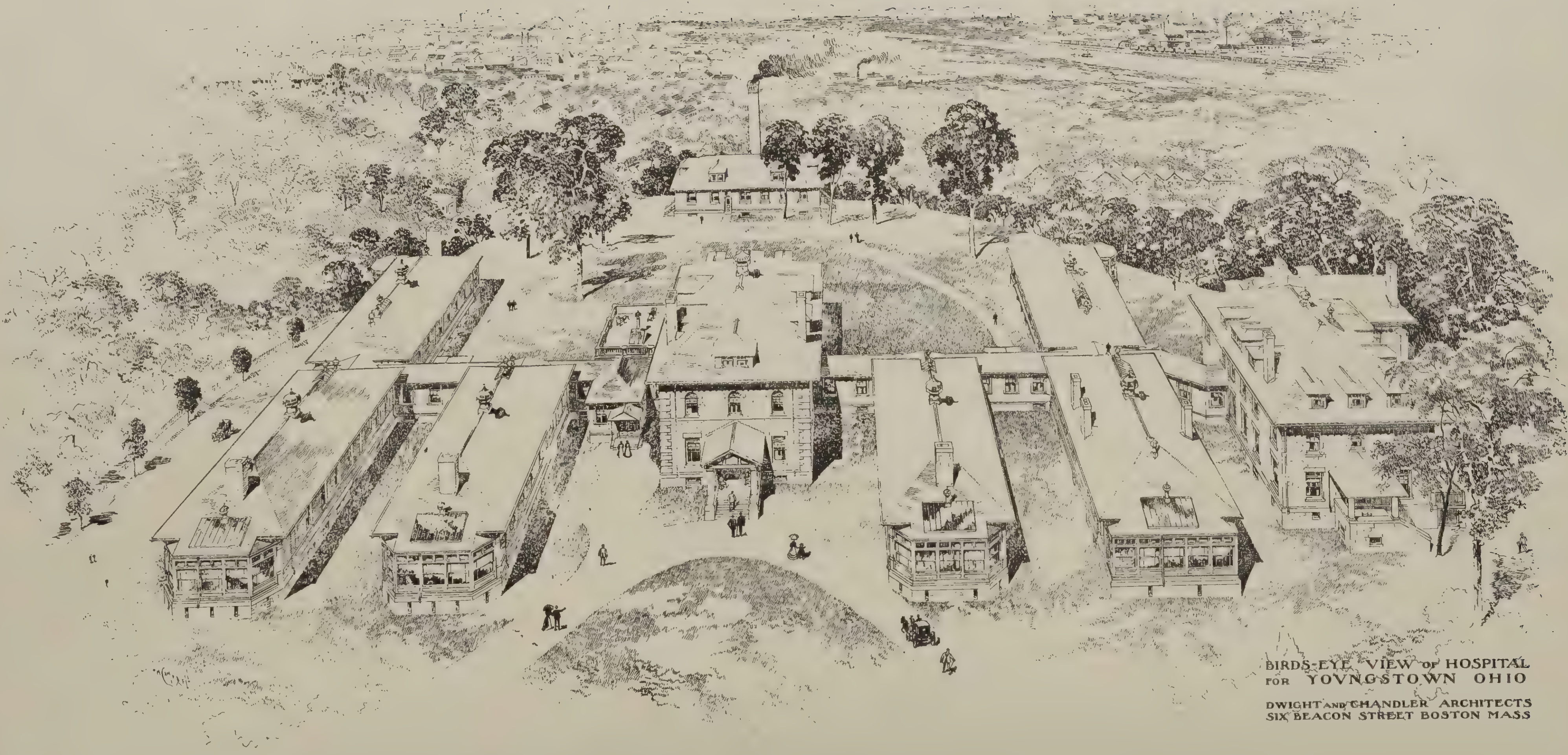
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, December 4th, 1901.



BIRDS-EYE VIEW OF HOSPITAL
FOR YOVNGSTOWN OHIO

DWIGHT AND CHANDLER ARCHITECTS
SIX BEACON STREET BOSTON MASS

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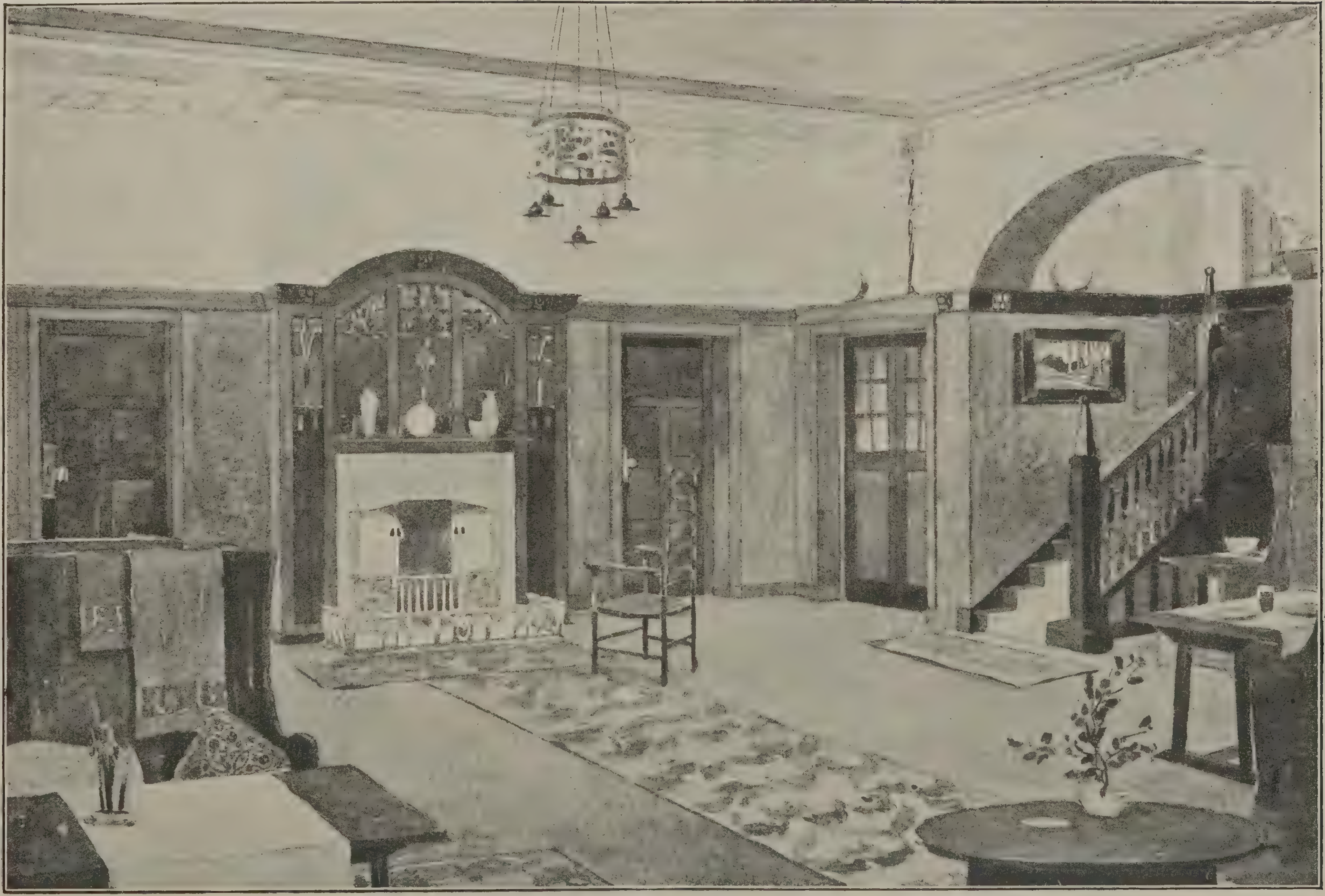
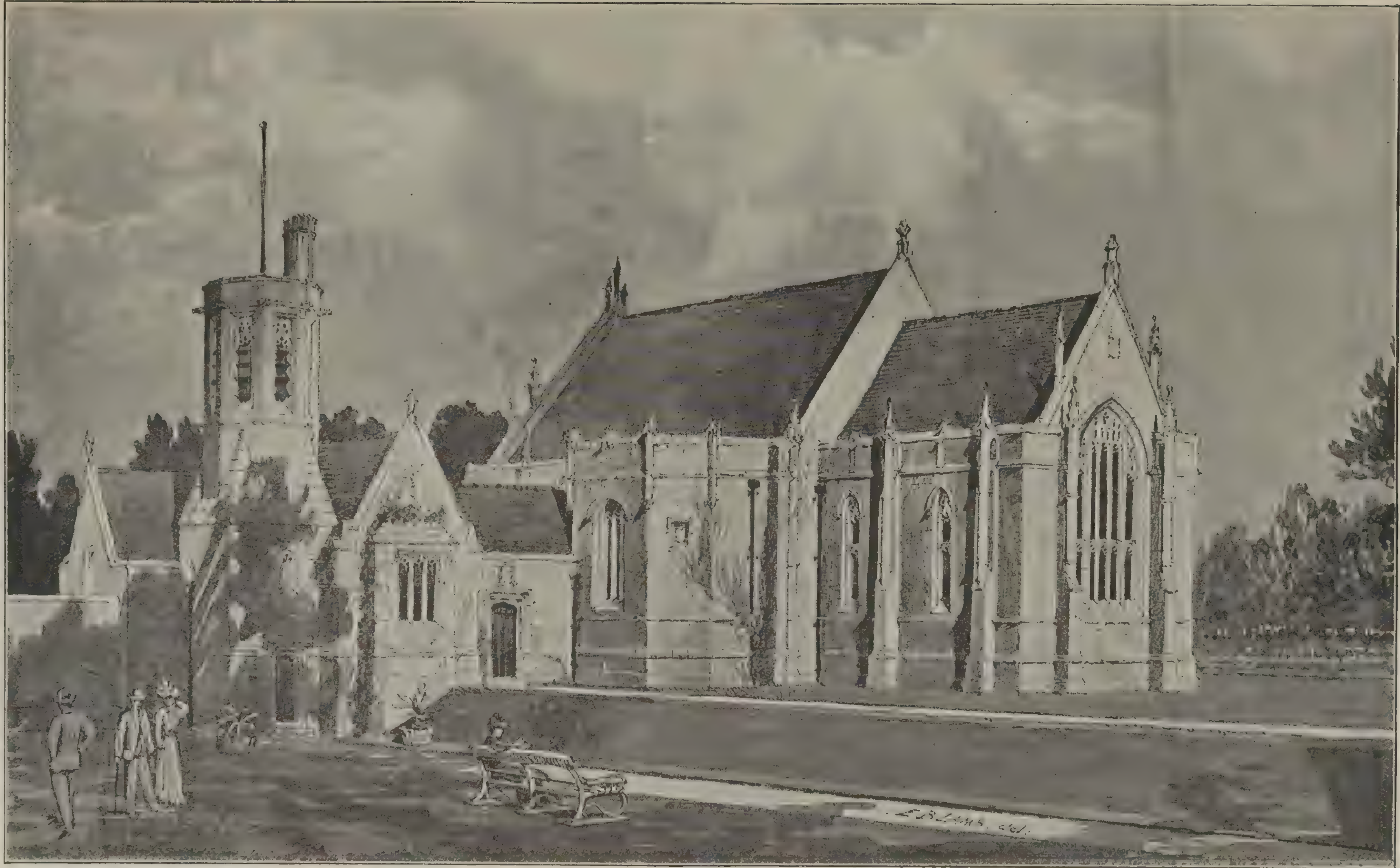


THE "DAVY HALL" RESTAURANT, YORK. Penty and Penty, Architects.

Supplement to
The Builders' Journal and Architectural Record,
***Wednesday**, December 4th*, **1901.**



BROMPTON HOSPITAL CHAPEL. The late E. B. LAMB, F.R.I.B.A., Architect.

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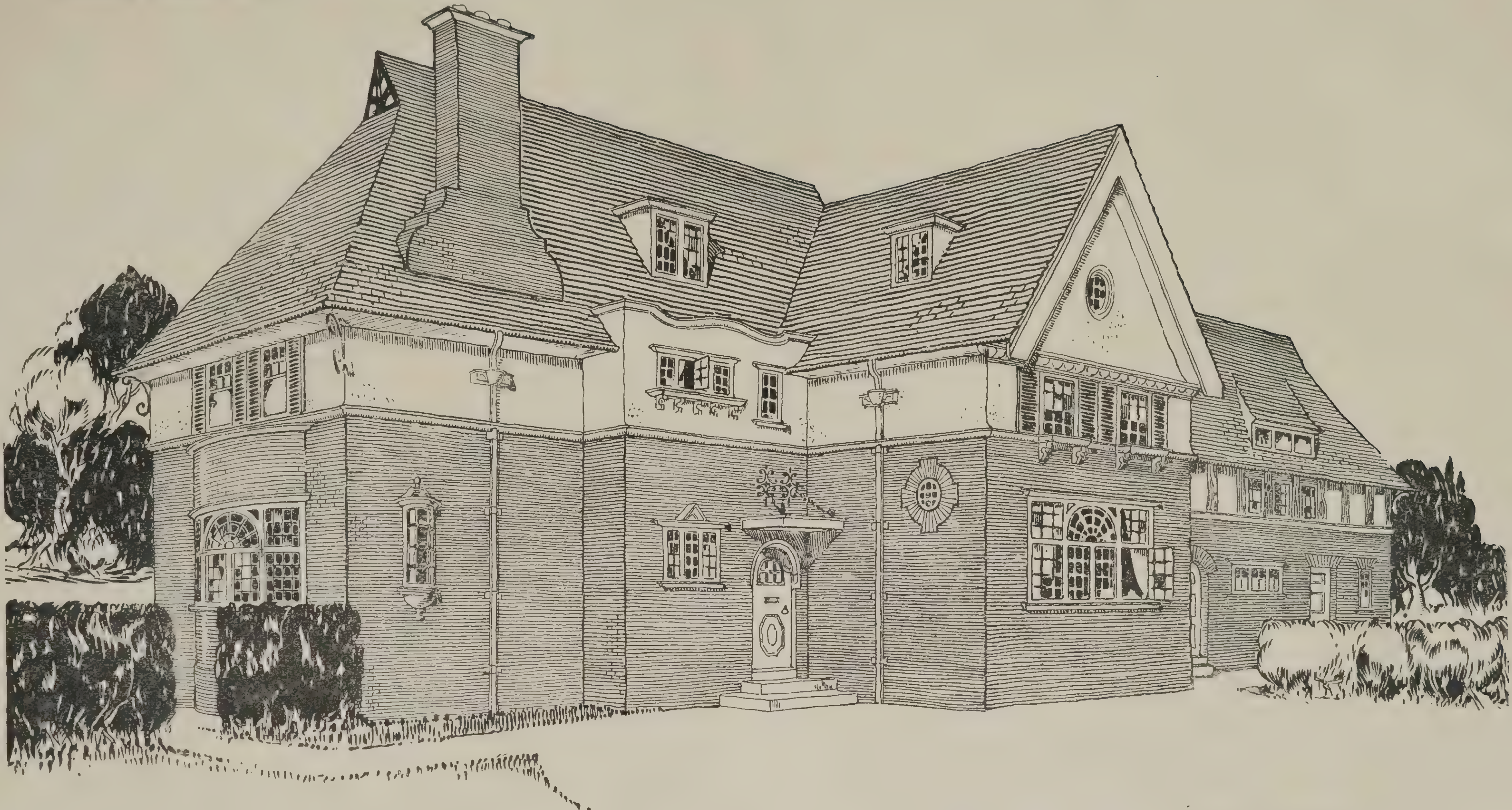
Wednesday, December 4th, 1901.



HOUSE AT KINGSTON-ON-THAMES.

G.A. Hall F.R.I.B.A. Arch^{t}.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Text-books on Building Construction.

Wisbech.—B. H. writes: "What text-book on building construction would you recommend to a student, in a district where there is no art school, intending to sit at the May, 1902, examination?"

"Rivington's Notes on Building Construction" is the most trustworthy text-book. Part I. (10s. 6d.) is the first stage or elementary course; Part II. (10s. 6d.) is the second stage or advanced course; but for the Honours examination at South Kensington, Part III. (21s.) on Materials and Part IV. (15s.) on Calculations for Structures are required. Part III. is generally to be relied upon for its facts, but is very unscientific in treatment. Part IV. is unsatisfactory. The articles on building construction now being published in our columns should meet the want, but if you have a sufficient knowledge of higher mathematics you cannot do better than study Rankine's "Manual of Applied Mechanics."

Wood Roofs.

Hull.—F. R. A. writes: "Which is the best form for a wood roof-truss for a span of 46ft., the pitch being 45 degs.?"

A Queen-post roof, examples of which will be found in Rivington's "Building Construction," Part II.

Extra Strength due to Herring-bone Strutting.

Croydon.—Oval writes: "Please give formulæ for determining the extra strength which one row of herring-bone strutting gives to a floor."

Herring-bone strutting adds no strength to a floor as a whole, but helps to spread a concentrated load, beyond the point at which it is applied, to the surrounding joists. There is no formula applicable, although the case is very much like that of a "distributing girder" in the construction of railway bridges. It would be possible to obtain a formula by testing a floor to destruction; but without such experiment there is no way of arriving at the actual increase of strength. HENRY ADAMS.

A Difficult Point under the L.B.A.

London.—H. B. writes: "We have made application to the Orsett Rural District Council for permission to erect tenement buildings at Tilbury Park Estate in accordance with the enclosed plan (not reproduced). The buildings are of two storeys and the walls do not exceed 25ft. in height. Each house contains four tenements, two on the ground floor and two above. Each tenement has a separate entrance from the front, those to the first floor having a separate staircase each. The Orsett Rural District Council object to plans on the ground that the central division wall is a party wall and should be 9in. thick for its entire length and should be arried up to the underside of the slates on the roof. We contend that we are entitled to build the wall is 4½in. thick for whole length and need not take it up beyond the ceiling of the first floor. The by-law upon which they base their objection is similar to section 5, sub-section 16 (a) of the London Building Act, 1894. Under what section of this Act is it allowable to build the central wall in 4½in. brickwork and to the ceiling level only?"

It would not be possible under the London Building Act to build a party wall 4½in. thick and to stop it at the ceiling-level, as shown on the plan submitted. There is no restriction to the size of a domestic building; and if an opening were made in the 4½in. wall separating the two buildings, I think it might be held that the tenements constituted one building only and did not require a party wall. I think it will be found on enquiry that this is what was done in the case of the building in Croxted Road, and that the Act was evaded in this manner.

X.

Architectural Photography.

Edinburgh.—Photo writes: "On p. 493 of your issue for July 31st last you stated that Sir Benjamin Stone 'observes all the main requirements' in his photographs. What are the requirements for successfully photographing architectural subjects?"

It would seem to be a simple matter to answer this enquiry, but as a matter of fact so many considerations are involved that columns might well be devoted to them, and if "Photo" really wants to go into the subject he had better read it up in the numerous books which can be consulted at any public library. We may briefly say, however, that the main requirements of an architectural photograph are that its vertical lines shall be vertical, its horizontal lines horizontal, its arches and windows shown complete and not cut in halves or quarters, its focus equal over the whole picture, its foreground, middle-distance and sky harmoniously arranged, and its composition truthfully rendered. When, in the notice of the exhibition of photographs at South Kensington, we stated that it was perhaps unfair to compare Sir Benjamin Stone with such an architectural photographer as Mr. F. H. Evans, we meant that he displays no such technical ability or artistic feeling. Mr. Horsley Hinton once remarked that he objected to printing being simply a matter of sun and paper, and it is just this interference in correcting defects or enhancing portions of a photograph which distinguishes between the ordinary man and the artist. Yet it must not be thought that such interference necessarily means the distortion of actual facts. For example, Mr. Evans will spend an immense amount of time in composing an interior stone stairway on his screen, and will exercise infinite pains and numerous devices in developing and printing, but the result is not to show the stairway as it does not exist, but to represent its values to the utmost advantage, making a picture as well as a record; whereas the ordinary photographer would produce a record only. This practice is of course subject to abuse, and undoubtedly tends to conventionalities, but in capable hands it is perfectly safe and perfectly commendatory.

Book on Modelling.

Liverpool.—Modeller writes: "Is there any good book on modelling in clay?"

"Modelling: A Guide for Teachers and Students," by E. Lanteri (Chapman & Hall; 15s. nett).

Architect's Liability for Contractor's Neglect.

Preston.—R.I.B.A. writes: "Is the architect of a new building liable for the neglect of the contractor to make good the damage caused by him to adjoining property?"

No. The builder is responsible, and he should be sued.

Carolina Pine.

Swindon.—J. H. J. writes: "Kindly give some information as to the quality and durability of Carolina pine. Is it suitable for flooring, grooved and tongued; would it be advisable to use this wood in connection with pugging?"

Carolina pine is not good for flooring, as it wears in ribs, being coarse in grain.

Ownership of Drawings, Specifications and Quantities.

Y. Z. writes: "I have had extensive alterations made to my house, the contract for which has now been completed about eighteen months; but several things have not been done to my satisfaction. I have called the architect's attention to them, and have written to him asking for a settlement, but cannot get anything done. What further steps can I take? Can I demand the drawings, specification and quantities to ascertain the quantity and quality of the materials to be used?"

The architect is in the position of an arbitrator between the contractor and client, and is only liable for incompetency or fraud. You cannot demand the specification or drawings as these are the architect's property, being his memoranda, and the quantities are the property of the builder who paid the quantity surveyor's fee, and are merely aids to him in estimating. To prove fraud you must be able to prove collusion or swindling.

Books on Elizabethan Architecture.

Newport.—E. E. writes: "Please mention some books dealing with Elizabethan architecture."

"Early Renaissance Architecture in England," by J. Alfred Gotch (Batsford, 21s.), and the general histories, such as Fergusson's and Fletcher's.

Examinations for Architects and Surveyors.

Tunbridge Wells.—A. G. writes: "Are there any preliminary examinations to be passed before anyone can enter for qualification as A.R.I.B.A. or F.S.I.; if so, where can I obtain a copy of the examinations?"

Naturally, there are examinations to be passed. Obtain the Kalendar of the Royal Institute of British Architects from the secretary, 9, Conduit Street, W., price 2s. 6d., and the syllabus of the Surveyors' Institution examinations from the secretary, 12, Great George Street, Westminster, S.W., price 1s. 6d. These give the latest examination papers.

Designs for Chimney-pieces.

Cardiff.—Ionic writes: "Where can I procure designs of marble and stone chimney-pieces, and would they be copyright?"

You can obtain old examples from measured drawings contained in such books as the Abbey Square Sketch-book and the Architectural Association Sketch-book (to be obtained from Mr. B. T. Batsford, of 94, High Holborn). Modern examples are chiefly illustrated in trade catalogues and the building periodicals, and are copyrighted.

Cost of Rubble Walling and Railings.

Moseley.—E. S. M. writes: "What is a stone rubble wall with cast-iron railings worth a foot run? It is to be erected of local stone near Bolton, Yorks. Will a thickness of 14in. be sufficient for the district?"

We can only give you rough approximate prices. The price of the cast-iron railings depends upon the design, but they would probably cost about 2s. 6d. per ft. run. Coping in local stone would cost about 1s. per ft. run, and the rubble wall about 1s. per ft. cube. A 14in. thick wall would be quite strong enough; it might be less.

Explanation of Ivory Sector.

London, W.C.—O. G. writes: "I have an old-fashioned single-fold ivory rule marked with certain scales diagonally across it. What is the meaning of these scales, and how are they used? They appear to be logarithmic scales like those on a slide rule."

The scale drawn is known as a sector. A full description of its use will be found in Heather's "Drawing and Measuring Instruments" (Crosby Lockwood & Son, 7, Stationers' Hall Court, E.C., price 1s. 6d.). This scale was commonly used by engineers before 1850, but it is now practically obsolete, the slide rule having taken its place.

HENRY ADAMS.

Strength of Steel Stanchion.

Newcastle-on-Tyne.—Student writes: "In designing a steel stanchion 20ft. long to carry a load of 20 tons on the top and 18 tons on a bracket 10ft. below, and using a 12in. by 6in. by 54lbs. R.S.J. (Dorman Long & Co), what calculations would be necessary (1) to arrive at the correct form and dimensions of the bracket and the number of rivets that would be required to ensure proper resistance to the stress; (2) to arrive at the area and thickness of the concrete that would be required to bear the load on compact earth if the usual stone base were omitted; and (3) what difference would it make in the calculations if these loads were taken in the direction of the flanges of the stanchion instead of in the direction of the web?"

A 12in. by 6in. by 54lb. Dorman Long R.S.J. used as a stanchion would carry 38 tons axially, but would not be strong enough to carry 18 tons on a side bracket and 20 tons on top, owing to the increased compression set up on the bracket side of the stanchion by reason of the resultant of the load being out of the centre. In answer to the other questions (1) the bracket surface should be at least large enough to limit the load to 40 tons per ft. super.; therefore, 18 tons would require a bracket not less than, say, 12in. by 6in., but this may be reduced if the web of girder is connected to stanchion by vertical angles on each side. Assuming $\frac{7}{8}$in. steel rivets, each will bear $2\frac{1}{4}$ tons single shear; therefore, $18 \div 2\frac{1}{4} = 8$ rivets as the minimum to connect the girder to stanchion; but it would be wise to increase the number in case of some not quite filling the holes. (2) A stone base is not essential, but if the stanchion rests direct upon the concrete the flange must be considerably enlarged. On cement-concrete the flange to carry a load of 40 tons should be 10 sq. ft. area, properly stiffened. The area of concrete should be such as to reduce the pressure on the earth to, say, $1\frac{1}{2}$ tons per sq. ft. The thickness of the concrete should be, say, twice its projection beyond the flange. (3) A stanchion of this kind will carry much less if the girder butts against the web than if it butts against a flange, owing to the great difference in the moment of inertia in the two directions. This matter is pretty fully worked out in "Designing Ironwork, 2nd Series, Part II." (Spon, 2s. 6d.) There is not space to reproduce the methods here. HENRY ADAMS.

New Patents.

These patents are open to opposition until January 6th, 1902.

1900.—Reciprocating Wood-Sawing Machines.—22,909. G. Pickles, Royd Iron Works, Hebden Bridge, Yorks. Short rods are provided at each side of the saw-frame, connected at their lower ends to the discs on the main driving shaft, and at their upper ends to a horizontal cross-bar secured to the frame. By thus dispensing with long connecting rods it is claimed that the working of the machine is made safer and that a higher speed is obtainable.

Stair Treads.—23,212. T. W. Corbin, 39, Victoria Street, Westminster, S.W. A cast-iron frame, forming a grid, is filled in with cement (or other suitable material) so that it stands above the iron on each side. This tread is inexpensive and can be reversed when one side becomes worn.

1901.—Artificial Marble.—16,640. O. Hertwig and E. Liebaug, both of Dörnfeld, near Königsee, Germany. A mixture is made of magnesite, 16 parts; chloride of magnesium, 17 parts; flint, 45 parts; kaolin, 5 parts; and water, 17 parts. This mixture is cast or poured on glass, with or without colouring matter to imitate the veining. It has a highly polished surface, and is claimed to be more tenacious than natural marble.

The following specifications were published on Saturday last, and are open to opposition until January 13th, 1902. *The name in italics is that of the communicator of the invention. A summary of the more important of them will be given next week.*

1900.—20,074, Frost, saw benches. 20,217, Lake (*Blamey*), door-fasteners. 20,496, Pruce, securing knobs and handles to spindles. 20,993, Moore, windows. 21,238, Aston, conveyors. 21,276, Robinson, pipe-joints for water-closets. 22,171, Twamley, chimney-pots.

1901.—339, Swift, closing device for the outlets of sink and other waste pipes. 542, Evans, closet-seats. 573, Bundy & Conne, weatherproof thresholds and window-sills. 623, Murchland, syphonic cisterns for water-closets. 770, Eicher, Will & Duncombe, door-locks and fastenings. 925, Abeleven, sheet metal roofing. 1,526, Wolfenden, apparatus for preventing steamy windows. 5,426, Pike, chimney tops and ventilating cowls. 6,158, Prior, hot-water boilers of kitchen ranges. 7,206, Newbigging, locking device for gas or other taps. 7,658, Jansen & Müngersdorf, coffered ceilings. 11,706, Weigle, organ pipes. 14,394, Prince, kilns for bricks, tiles, &c. 15,802, Stone, cork insulating strip for buildings, &c. 17,435, Burridge & Brown, saws. 19,413, Rymer, firegrates. 19,561, Osbourn, rust joints.

Builders' Notes.

Mr. Thomas Jackson, of Leyland, who carried on an extensive business as a builder and contractor, died recently at the age of fifty-four years.

The New Workhouse Hospital, Cheadle, Staffs, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

The Rainham Cement and Brick Industries are just now suffering from the depression that is experienced in the building trade. The employees at the Rainham Cement Works have this week been put on three-quarter time, and the same shortage in the hours of labour has been effected in the brickfields.

Collapse of a House.—A furniture shop in Westgate Road, Newcastle, and the premises above, collapsed last week without the slightest warning. The adjoining house had been removed and the erection of a new building had been commenced, but the workmen had just left the job when the accident occurred. Only one man was slightly injured.

Wallpaper Manufacturers, Ltd.—At the annual meeting held last week a resolution was passed approving the balance sheet and report of the directors, and declaring a dividend of 8 per cent. for the year on the Ordinary shares. The sum of £30,000 is placed to reserve, and the balance of £25,776 carried forward to next year's account.

The Scottish Building Trades Federation (Perth and District) held its annual general meeting recently. Ex-Bailie Forgan, joiner, was appointed chairman, and Mr. William Johnston, builder, vice-chairman. The following were appointed members of the Executive:—Messrs. Alexander Beveridge, builder; Alexander Fraser, builder; William Mackay, plasterer; James M'Leish, plumber; Bailie Brand, builder; Donald Campbell, plasterer; Michael Kerrigan, builder; Councillor David Morrison, joiner; Bailie Watson, plumber; George Bell, slater. Messrs. Fraser, builder, and M'Quibban, joiner, were appointed auditors. Mr. James Mitchell, solicitor, was reappointed secretary and treasurer.

Architectural Lectures to Workmen.—At their last quarterly meeting the Building Branch of the Aberdeen Operative Masons and Granite-cutters' Union passed the following resolution: "That this branch appoint a special committee for the purpose of arranging and organizing a series of lectures upon architecture, sculpture, geology and kindred subjects, and further invite the monumental branch to appoint a similar committee to act along with them." In view of the fact that architectural jobs have within the last few years become a most important part of the work done in monumental yards, it has become more desirable than ever that every granite-cutter should have at least an elementary knowledge of architecture and the history and development of architectural design. Even in monumental work, architectural details have to be incorporated in almost every design. The first lecture was delivered last week by Miss Nora Macdonald on "The Manners and Customs of the Ancient Egyptians."

Quick Building.—A part of the store premises of Messrs. Harrods, Ltd., in the Brompton Road, London, has recently been demolished and reconstructed in a remarkably short space of time by the contractors, Messrs. T. Allen & Sons. The idea was to carry through the work in the "out-of-season" time, so as to be ready for the winter's trade; and by keeping the builder's men employed night and day, as well as by preparing some months in advance the various materials required in reconstruction, it has been possible to produce new shops and two storeys above them within the brief period of ten weeks, counting from the time the men began to build the foundations. Seven hundred workmen have been constantly engaged on the job. Three thousand tons of English steel, costing £24,000, have been used on the building, an additional 10ft. being thrown into the roadway (thus beginning a widening scheme which will be carried out in its entirety as the leases of the various buildings in the Brompton Road fall in).

London County Council.—At last week's meeting of the Council the question as to the amount of work done by the bricklayers was discussed (see p. 274 of this issue).—The Improvements Committee reported the receipt of a further communication from the First Commissioner of Works, which reduced the original plan of widening Piccadilly at the Green Park from Hyde Park Corner to Walsingham House, at a cost of £30,000, to a smaller scheme, estimated at £13,536, which would carry the improvement only as far east as Down Street or thereabouts. The report was adopted.—Mr. R. Williams asked if an Anglo-American syndicate had offered to take the site in the Strand being cleared in connection with the Holborn to the Strand street; whether the Improvements Committee had agreed to grant a 999 years' lease; and if it was intended to erect a building eleven storeys high. Mr. Davies said the Improvements Committee had received a letter, which had been passed on to the Corporate Property Committee.—The Asylums Committee submitted a supplemental estimate of £900 for the completion of the lining of a well on the Horton estate, necessitated by the inflow of polluted water. The dug portion of the well is 200ft. deep, and it is being lined throughout with iron cylinders. Up to the present the well has cost about £6,150. The estimate was approved.

BIRMINGHAM DENTAL HOSPITAL COMPETITION.

On Thursday, Friday and Saturday last the designs submitted for the new dental hospital at Birmingham were exhibited at the Council House. The hospital is to be erected on a site at the southern corner of the intersection of Great Charles Street by Church Street. Having first considered the selection of a site, the committee determined to invite five leading Birmingham architects to submit designs. Of these five two were unable to accept the invitation, so that the sets of designs exhibited are only three in number, and are the work of Messrs. Bateman & Bateman, W. H. Bidlake, and Ewen Harper & Brother. Messrs. William Henman and Thomas Cooper, who were retained as assessors, reported in favour of the design submitted under the initial Y, to which the committee agreed; and on the sealed envelope being opened it was found that Messrs. Bateman & Bateman were the authors of the design. The requirements of the hospital demand the solution of many difficult problems in planning; and while the assessors pay tribute to the skill evinced by all three competitors in their designs, each of which has its own particular merits, they go on to say that no one design contained such a perfect embodiment of the committee's wants as to avoid the necessity of some modification. The design of Messrs. Bateman & Bateman has been selected, therefore, on the broad lines of its showing marked advantages, and being the most readily capable of moulding into a thoroughly workable scheme. Its chief feature is its excellently devised filling-room on the third floor, with accommodation for fifty patients' chairs. The great aim has been to provide for the direct access of the patients to the suites of operating rooms and the filling-room, to secure workrooms and private-rooms for the staff, for the nurses, and for students in convenient proximity to, though suitably cut off from, the public part of the hospital, and to ensure ample light from the proper quarter, with good ventilation throughout. The perspective of the selected design shows a brick and stone building of Renaissance character, having the hospital entrance in the centre of the Church Street front. Shops yielding a considerable annual rental occupy the remainder of the ground floor, with the exception of a back entrance at the upper end of the Great Charles Street front. The hospital occupies such part of the basement as is not taken up by the shop basements, while its principal rooms are on the first, second and third floors, to which lift access is provided in connection with the principal staircase. The caretakers and other rooms are provided for on a fourth floor in the rear of the building, and will not be visible from the street.

BUILDING CONSTRUCTION.

(Continued from p. 252, No. 354.)

Beams (*continued*).

44. THERE is some advantage in taking in order of complexity a series of beams and applying to them some of the results of these articles on beams.

Fig. 56 shows a projecting beam fixed in a wall at A. The small weight of 20lbs. is hung at the outer end; the weight of the beam itself is not taken account of. The bending moment at any point is found by multiplying the distance in ft. of the point from the end of the beam by the weight 20lbs., so that it increases regularly. If a point C is taken so that BC = 200 on any scale, and a straight line CD is drawn, a line drawn from any point at right angles to the beam to meet this inclined line will give the bending moment in ft. lbs. at that point. The shear is the same at every point, and it is equal to 20lbs. It may help the student to think of any part of the beam measured from the projecting end as a rigid body in equilibrium under two couples—(*a*) a couple of which one force is 20lbs. and its arm the axis of the portion of beam considered: its other force is the *shear* at the point taken, which is 20lbs., because the two forces of a couple are equal; (*b*) the other couple is a compound one made up of all the stresses in the fibres above and below the neutral axis.

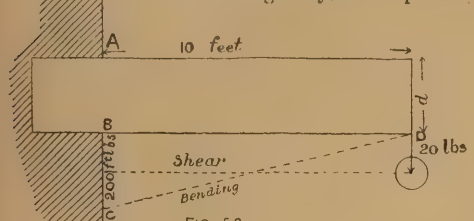


FIG 56

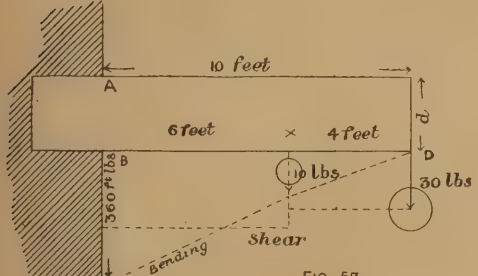


FIG. 57

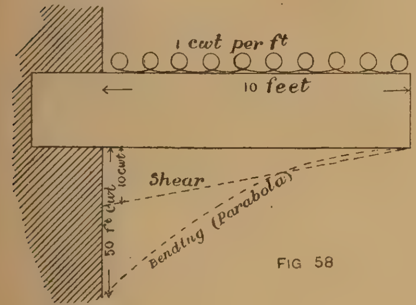


FIG 58

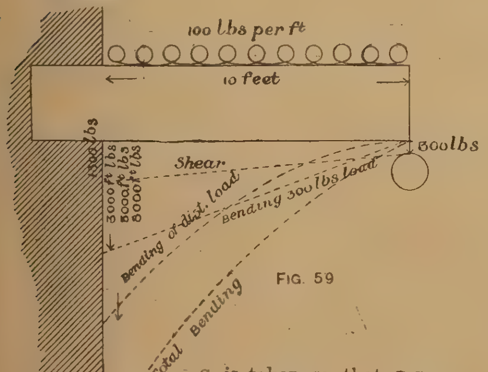


FIG. 59

Fig. 57 shows the same beam loaded at the end and at an intermediate point. If we consider, first, the 30lb. load, it can be dealt with as in Fig. 56: find a point at 300 and draw a straight line from this point to the end of the beam. Lines at right angles to the beam will by their intersection with this line give the bending moments at the points from which they are drawn; a further distance of 10 × 6 = 60 will give a point C, and if this point is joined to where the first line meets the vertical line where the 10lbs. is hung we shall have what we may call a compound line of bending moments. The shear for the first 4ft., measured from D, is 30lbs.; and for the remainder it is 40lbs., owing to the added 10lbs.

Fig. 58 shows the same beam with a uniformly-distributed load. This load may include the weight of the beam. The line of *shear* shows that the shear increases from the outer end towards the wall: it increases as the weight increases. The bending moment at any point is found by multiplying the sum of the weights between the point and the end by half the distance; if this is done for a number of points, and if lines are drawn at right angles to the beam at these points and made equal to the bending moments on some scale, the ends of these lines will be found to lie on a curve which may be drawn by joining the ends of the lines. This curve is known to be a parabola.

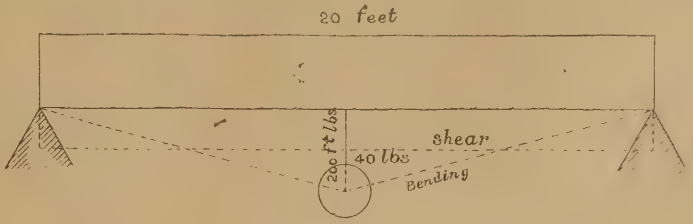


FIG. 60

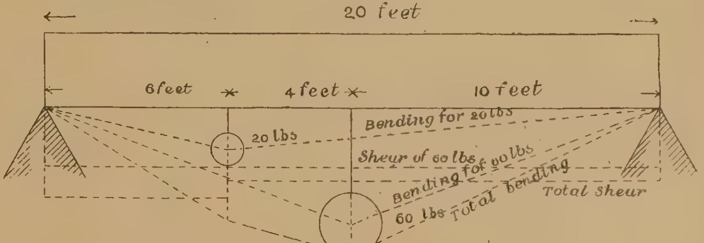


FIG 61

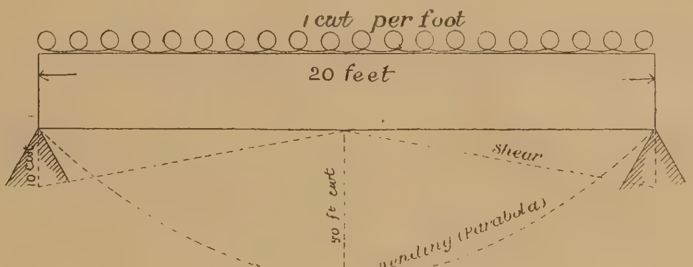


FIG 62

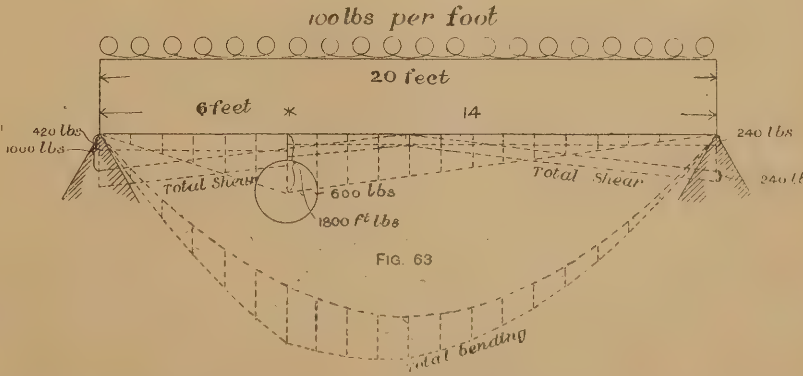


FIG. 63

Fig. 59 shows the same beam carrying both a distributed load and a load applied at the end. The curve marked "Total Bending" is found by adding the *ordinates* of the 300lb. load to those found for the distributed load curve *superposing*. (The lines drawn at right angles to the beam and terminated at the curve are *ordinates*. The student should know that ordinates are not necessarily at right angles to an axis.)

These diagrams are not to be taken as examples of real beams. The end said to be *fixed* in a wall is not to be taken as a workmanlike example of any such fixing. For any practical work the stability of the wall would be an important matter; the beam alone is here considered. The curves and lines show how the bending moment in all cases increases as we proceed from the outer end towards the wall and how in large *built* beams it will be safe to proportion the different parts to the duty they have to perform.

Fig. 60 shows a beam supported at both ends carrying a weight in the centre; Fig. 61 shows the same beam carrying two loads. The student will have no difficulty in seeing how the line of total shear and the line of total bending are drawn by *superposing* the separate lines found for the separate loads. Fig. 62 shows the same beam carrying a distributed load; and Fig. 63 shows a combined distributed load and a weight at a special point.

45. Fig. 64 shows two beams, one supposed to be fixed at one end and resting free at the other end, and the second fixed at both ends. I doubt if such conditions ever occur in practice; if they do occur, they are very rare and special cases. I shall have something to say about continuous beams later.

From Professor Unwin's "Elements of Machine

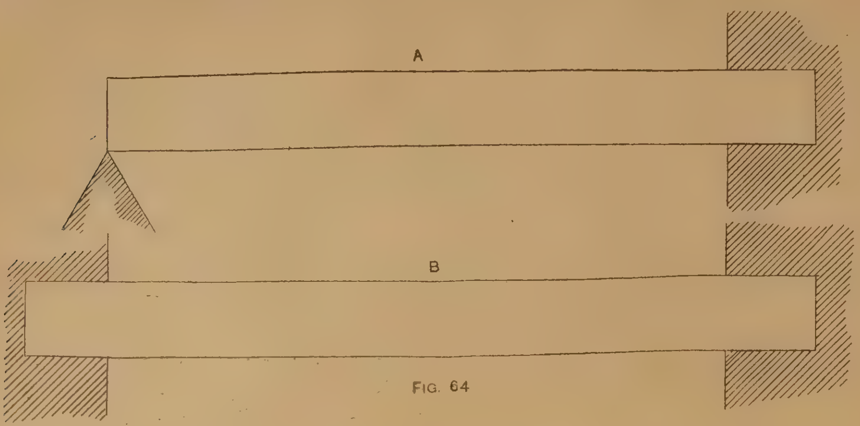


FIG. 64

Design" the beam A has for greatest bending moment (close to wall in which it is fixed) when loaded in the middle with a load W, $\frac{3}{16}$ Wl (l being the length of the beam). When loaded uniformly the greatest bending moment is at a point $\frac{5}{8}l$ from the fixed end, and $=\frac{wl^2}{8}$, where w is the load per ft. run. The beam B when loaded in the middle has a bending moment greatest at the walls, and $=\frac{Wl}{8}$; and when loaded uniformly the greatest bending moment is also at the walls and $=\frac{wl^2}{12}$.

46. *Diagram of bending moments.*—A B (Fig. 65) represents a beam resting with free ends at A and B; and p, q and r are loads resting upon it. Draw the diagram as shown. A T is the perpendicular of the triangle a P F; the triangle q O K is equiangular with a P F, and O H is its corresponding perpendicular, $\frac{AT}{PF}=\frac{OH}{KN}$ $\therefore$ A T . K N = O H . P F, where K N is the force upwards at A. In the same way, because U T is the perpendicular of the triangle V S F, and this triangle is equiangular with O W K, U T . p = O H . F S. But the moment at T is the difference of these moments; it is, therefore, O H (P F — F S) = O H . P S : O H is a constant, and therefore the bending moment is proportional to P S. If we have a suitable scale, any such line as P S intercepted between the string polygon and a b will by its length give the bending moment at any point such as T. To find the scale, produce a c and b c to intersect at c, draw c d at right angles to A B, cutting A B at X; now if the loads p, q and r were all concentrated at X the line d c would represent the bending moment. This bending moment is the upward force at A × A X = N K . A X;

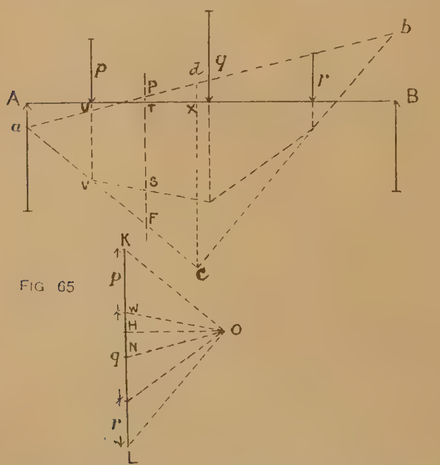


FIG 65

so that if the line d c is divided into equal divisions so as to represent the number standing for N K . A X it will serve for a scale to measure any such line as P S as bending moment at the place.

47. If the student remembers that the *shear* at any cross-section is the algebraic sum of the applied vertical forces to the right or left of the section, he will, knowing these forces, have no difficulty in determining the shear at any point. In regard to moving loads and providing for them it should be remembered that for practical purposes what is wanted is to determine the *maximum* stresses where they come, and what is their amount. In most cases it is easy to do this with the necessary accuracy by making a few diagrams of the moving load in different positions. The student should do this for himself. If he has followed these articles he will have no difficulty in dealing with any practical question in the strength and deflection of beams. Fig. 66 shows a bending moment diagram for a beam loaded irregularly. It would be more satisfactory for practical purposes if the point O had been taken closer to Q R, because this would have given what I may call greater *sag* to the string polygon.

Where beams carry walls the load is in most cases largely self-sustaining. Fig. 67 shows a section, and portion of elevation, of a lintel spanning a fairly wide opening (28ft.). A rolled joist is laid on its side; the wall over it is of cement-concrete; the bolts shown are put in position; the concrete is carefully packed about them; and when it has risen a sufficient height washers are put over the ends of the bolts and the nuts are tightened down. Such a lintel could be tied up through an arch, the arch and joist making between them a bowstring girder. I live in a region of very good building stone—mountain limestone—and among masons who are expert in building hammer-dressed rubble masonry. When such masonry is built with freshly-quarried clean stones well filled up with good Portland-cement mortar, the joints wide and the mortar coarse—*i.e.*, made with clean gravelly sand—I call the work "built concrete," because it differs from common rubble masonry. With masonry of this kind no arch is required, and the lintel may be put in as shown in the figure. In the case of a thin wall the joist is of use to give it stiffness transversely. There is no danger of trouble from expansion. When iron is in close contact with masonry the range of temperature is comparatively small. While speaking of this kind of building I may say that some years ago I designed a concrete water-tank, altogether above ground; a circular tower, 30ft. high and 20ft. internal diameter, strengthened with iron hoops which were placed close to the outside face in the concrete as the work was carried up; the concrete is only 2ft. thick; there is a heavy cornice, and the tank is covered on top—two or three hoops being let in here also. This work was carried out; it is watertight and apparently satisfactory in every way. In my practice I have a good deal of bridge-building, and I have built many small bridges having iron side-girders with a concrete platform between.

Continuous Girders.

48. Fig. 69 shows a continuous girder shown with exaggerated deflections. At the point (or cross-section) where the radius of curvature changes from one side to the other the curvature is nought, and where the curvature is nought there is no bending moment. There is only a shearing stress, and the girder may be cut into parts and placed as in Fig. 68. If the girder is of uniform cross-section the bending moment over the pier should equal the bending moment at the centre of the middle connecting lengths of girder a. Suppose the load to be uniformly distributed and of $w$lb. per ft. run, the bending moment at the middle point of a is $\frac{a^2w}{8}$.

The bending moment over $B=\frac{aw}{2}\cdot\frac{b}{2}+\frac{bw}{2}\cdot\frac{b}{4}$ $=\frac{w}{4}\left(\frac{b^2}{2}+ab\right)$, from which $\frac{a^2}{2}=\frac{b^2}{2}+ab$. $b = \cdot41a$. Suppose such a girder uniformly loaded arranged as in the figure (68), it will be in equilibrium, but the least inequality or want of uniformity of loading will upset the structure. If, however, the intermediate piers are not knife-edged as in the figure, but of the breadth c d, it is manifest that any moving load, in addition to the uniformly-distributed load, coming from A towards B will tend to bend b over c, and we have the moment of $bw\times\frac{cd}{2}$ to draw upon to maintain the stability of the structure. With flat-topped piers we see that we can afford to make the b pieces $=\cdot41a+$ the breadth of the pier. Where the rolling load is small compared to the fixed load this steadying moment may be quite enough, and the bridge may be constructed as suggested in Fig. 68. If the girder is continuous and rests on knife-edged piers the effect of a rolling load is to alter the positions of the points of no bending moment; and if the fixed load bears a very large ratio to the moving load, the change of position of points of no curvature (points of inflection) may not be very great. The investigation of this subject may be made as intricate as ever we please by choosing varieties of loads and by varying the cross-section of the girder to suit the maximum bending moments at various parts. The portions over the piers may be increased in spread, and they may be braced and strengthened till the structure becomes what is called a cantilever bridge. A general conclusion to be drawn is that there is great economy of material when a girder is made continuous over a number of piers, and this economy of girder material is to be measured against the cost of making the piers so that they can be relied upon not to "settle" in any way. There is no more risk in using continuous girders in bridges than there is in using masonry arches; in both cases we must be able to rely on the sufficiency of the foundations. A rail of railway "permanent way" is a most common form of continuous girder; and in this case both the foundations are yielding and the rolling load is enormous compared to the permanent load (the weight of the rail).

49. In the case of bridge girders, in providing for expansion, there is not the same objection to placing the girders on "rockers" that there is in the case of roof-trusses where we have no sufficient end obstruction. When a roof-truss rests in a short stirrup any side movement raises the centre of gravity, and when the stirrups hang "plumb" the condition is one of stable equilibrium; if instead of resting in a stirrup the truss rested on a "rocker"—the reverse of a stirrup—the equilibrium is unstable and an end force is needed. A bridge can easily be prevented moving endwise; and rockers such as a and b (Fig. 70), made fit to carry the weight as struts and able to act as ties (if a moving load requires a tie—as, say, at b, to help the permanent load to keep the girder down at b), are a perfectly good means of providing for expansion and contraction. I have repeatedly used the comparison between the moving load to the permanent load in connection with comparative permanence of stresses: long rockers give a means of making the weight of the piers help the permanent load to modify changes induced by moving loads, so as to almost prevent change of points of inflection. What do I mean by long rockers? The rockers I recommend should be fairly long, so that a slight movement will not appreciably lower the centre of gravity of the load; but as they are struts as well as ties, we shall see later that this will limit their length. They should be anchored well down in the masonry so as to be loaded to withstand any lift possible to come upon them. There is no need for them to be hinged; they can be formed to have enough flexibility at their ends to yield sufficiently to expansion movements in the continuous girder.

Suspension Principle.

50. We have seen that a string loaded with equal beads equally spaced hangs in a curve called a

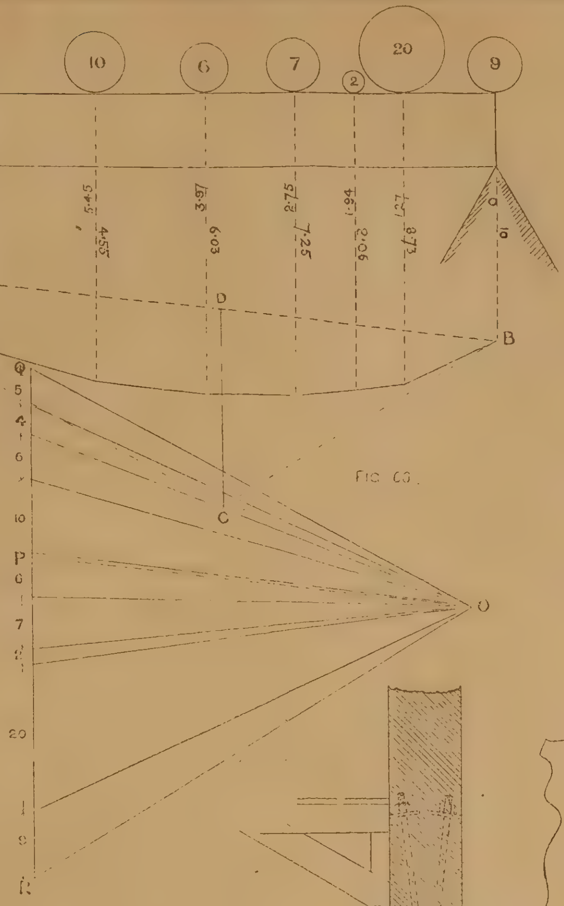


FIG. 66.

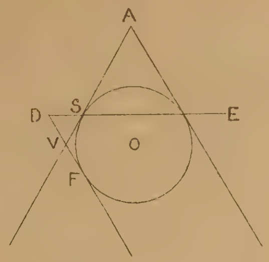


FIG. 71

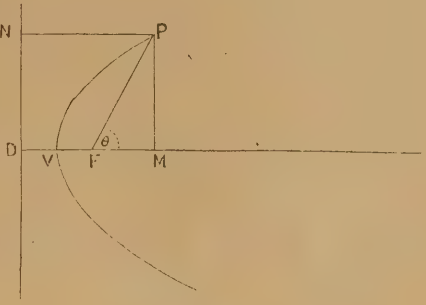


FIG. 72.

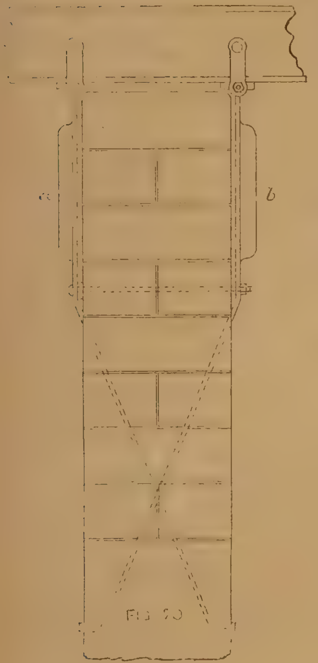


FIG. 70

FIG. 67

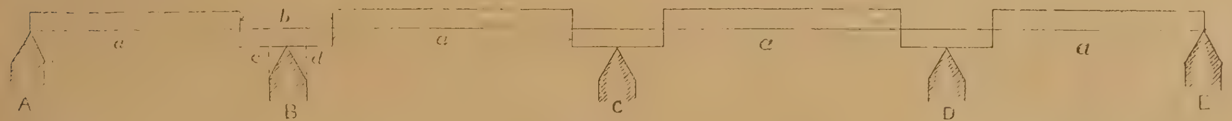


FIG. 68

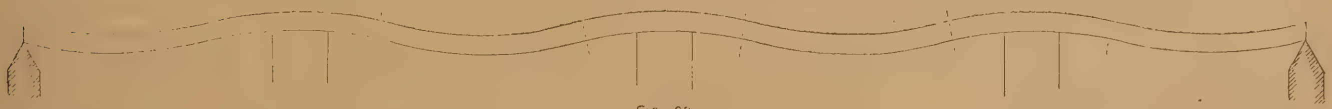


FIG. 69

catenary, or chain curve. The student has been told that the curve of bending moments of a beam loaded uniformly is a parabola; and he may infer that if the beads are spaced on the string so that when it is hung up and takes its curve the vertical lines through the centres of the beads are all equidistant, the curve is a parabola. To say that the first curve is a chain curve is merely repeating oneself, because the links of the chain are supposed to be equal in length and in weight, and they form both the beads and the string; but the idea of a parabola arises in a different way. If a right circular cone is cut by a plane parallel to the slant of the cone, the curved line where the cutting plane meets the surface of the cone is a parabola lying on the cutting plane. We can draw a parabola by drawing a plan and elevation of a right circular cone, assuming a cutting plane parallel to the slant of the cone, and finding (by descriptive geometry) points on the curve, and then rebating the cutting plane on the horizontal plane of projection. But we do not need to take all this trouble.

Fig. 71 shows the elevation of a cone whose vertex is A. O is a sphere placed in the cone so that it touches it in a circle lying in a plane represented on edge by the line D E. The plane whose cutting produces the parabola is shown on edge as D V F, and this plane touches the sphere at the point F. The two planes intersect in a straight line at right angles to the plane of the paper, and the point D is on this line. If we can take the plane represented on edge by the line D V F, and lay it down so as to lie in the paper (Fig. 72), we shall see the line D, the point V, and the point F, and with these points and the line given in position we can draw the curve. From Fig. 71: V S = V D = V F. Now the curve (Fig. 72) will be found to be such that a line drawn from F, as F P, to any point on the curve is equal to the distance of P, as P N, from the line N D, N D being at right angles to D F, and this is the law of the curve. Just as a circle may be defined as the locus of a point which moves so that its distance from a fixed point, the centre, is constant, a parabola may be defined to be the locus of a point which moves so that its distance from a fixed point (the focus F) shall be always equal to its distance from a fixed straight line (N D, the directrix).

Now (Fig. 72) $FP = DM = DF + FM = DF + FP \cos\theta$; that is, $FP = \rho = \dfrac{DF}{1 - \cos\theta}$, where DF is a constant, and this *equation* expresses the law of the curve. I have gone into this matter in the endeavour to interest junior students in such questions. Now the *equation* to the curve of the bending moments for uniformly-distributed loading of a beam can be got out from the loading conditions, and in this way it is identified as a parabola. We can see that when a string is loaded with a number of loads hanging vertically the stresses increase as we approach the points of support. We may consider the chains of a suspension bridge in the light we have from load diagrams of loaded strings.

51. We can make the string take any shape we please by our manner of loading it. In most suspension bridges there is a very great horizontal component in the pull of the chain where it meets the top of the pillar, and this is taken by the horizontal component of the stress in the chain between the top of the pillar and the anchorage. I give one illustration (Fig. 73) to show that if the loading of the chain is made so as to give it a semi-elliptical or semicircular curve, the chain may be made as nearly as ever we please, independent of anchorages. It will be seen from the diagram that for this kind of loading a thrust is put upon the girder carrying the roadway. The student must not infer from this diagram that I put it forward as a specially satisfactory form of suspension bridge.

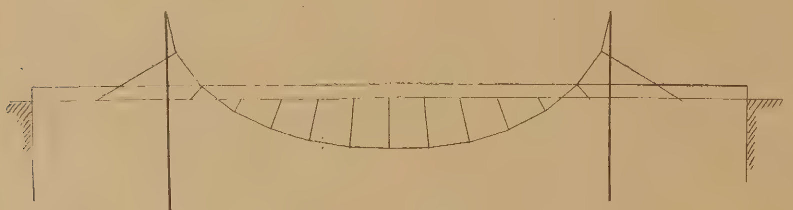
Struts.

52. In paragraph 20 (p. 185, October 23rd), in connection with the pressure of voussoirs carrying a load, I dealt with a matter which is important in this subject of struts. First, there is some difficulty in applying a pressure so that it will be uniformly distributed; and, second, I explained (Figs. 18, 19, 20) the rule that the "polygon should lie within the middle third of

the depth of the voussoir"; that if it did not lie within this region a tensile stress (or the need for strength to resist a tensile stress) would be shown at the joints. The effect of the line of centre of pressure being at the centre of gravity of the bearing surface of the voussoir, which suppose to be a rectangle, is to distribute the pressure (the stone being properly bedded) evenly over the surface; if it is to one side, that side has more to do than the other side; and we have found that when the centre of pressure is at the middle point of a line which is parallel to a side, and lying at a distance from that side of one-third of the breadth of the rectangle, the upper edge is just relieved from pressure. If we transfer our thoughts from the mutual pressure of two rectangular stone surfaces to a cross-section of an iron or wood strut sustaining an end pressure or stress, we can think of this centre of pressure going outside the middle third; some of the fibres are then in tension; we have a neutral axis, and the conditions bear comparison with those of a cross-section under bending. It is easy to see that this straying of the centre of pressure from the centres of gravity of cross-sections is greater at the middle of the strut than near the ends; that is, it is greater in long struts than in short struts, and it has a shorter range in the middle third of small cross-sections than in the middle third of large cross-sections. Every stress produces strain; the deformation of the strut sends the centre of pressure further from the centre of gravity of a cross-section, and if the stress is sufficiently great a "long" strut fails by cross breaking (partly crushing and partly tearing). (Students who have some knowledge of mathematics are referred to Professor Perry's "Practical Mechanics," pages 463–471. $P = \frac{EI\pi^2}{4l^2}$ (1) is *Euler's law of strength*, where P is the total pressure on the strut, E Young's modulus for the material, I the moment of inertia for the cross-section about the axis through its centre of gravity at right angles to the plane in which it most easily bends, and l the length of the strut. This formula applies to struts hinged or rounded at the ends, as A (Fig. 74). If a strut has flat ends (B, Fig. 74), it is prevented from bending at the end; and for such a strut Euler's formula is $P = \frac{EI\pi^2}{l^2}$ (2), which shows that a strut with flat ends may be twice as long for the same load as a strut with hinged ends. The assumptions on which these expressions have been arrived at are that the struts are straight and that the material is homogeneous, and these conditions cannot be absolutely counted upon in practice. A reliable formula for practical purposes is $P = \frac{pA}{1 + a\frac{l^2}{k^2}}$ (3), where P is the breaking load, p the breaking stress per unit of area for the material, l, the length of the strut, and k the least radius of gyration for the cross-section. (The moment of inertia being the sum of the products of each elemental area multiplied by the square of its distance from an axis, the radius of gyration is found by dividing the number representing the moment of inertia, I, by the number representing the area A, and extracting the square root $k = \sqrt{\frac{I}{A}}$. The moment of inertia of a mass about an axis is the sum of all the products found by multiplying each element or particle by the square of its distance from the axis; if we could imagine the whole mass concentrated in one point, the distance of this point from the axis is the radius of gyration. It gives some difficulty to have a mental picture of the radius of gyration of a mass: it involves the conception of mass without volume or size; but the student will fail to have any direct mental picture of the radius of gyration of an area about an axis.)

(3) may be written $P = \frac{pA}{1 + nB}$. p, n and B have been experimentally found and tabulated.

I take the following from Perry's "Applied Mechanics," pp. 468–469.



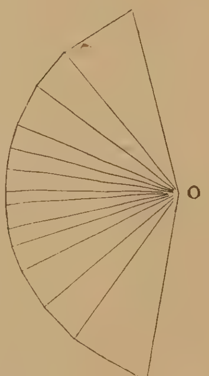


FIG. 73

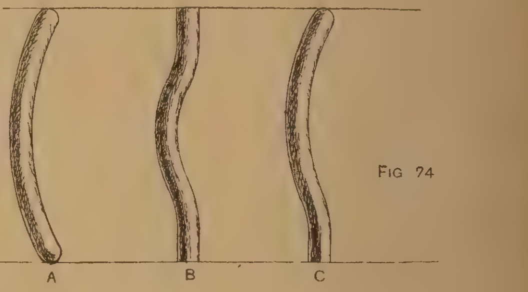


FIG 74

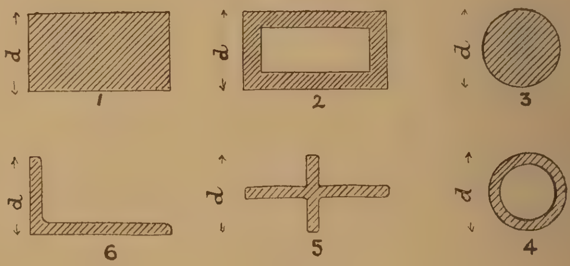


FIG. 75

TABLE IX.

—	Breaking stress in pounds per square inch $= p$.
Cast-iron	80,000
Wrought-iron	36,000
Timber	7,200

TABLE X.

VALUE OF B FOR STRUTS OF THE SECTIONS SHOWN IN TABLE C.

The first column gives the length of the strut divided by its least cross sectional breadth d.

l length divided by d least breadth.	B for cast-iron.	B for wrought-iron.	B for strong dry timber.
10	0·748	0·132	1·0
15	1·68	0·300	3·6
20	3·00	0·532	6·4
25	4·61	0·832	10·0
30	6·76	1·200	14 4
35	9·20	1·632	19·6
40	12·00	2·132	25 6
45	18·72	3·332	40·0

TABLE XI.

(See Fig. 75.)

1. Square, of side $= d$; or rectangle with smallest side $= d$	$n = 1·00$
2. Hollow rectangle or square	$n = 0·50$
3. Solid circular section	$n = 1·33$
4. Ring section	$n = 0·66$
5. Cruciform section	$n = 2·00$
6. Angle	$n = 2·00$

(*To be continued.*)

MUNICIPAL UNDERTAKINGS.

A Comparison Between England and America.

IN the course of an address at the dinner recently given to him by the Municipal Trading Committee of the London Chamber of Commerce the Hon. Robert P. Porter, the United States Commissioner in Cuba, said America seemed to have been more successful than England in drawing the boundary line, as it were, between legitimate and illegitimate municipal undertakings. Rightly or wrongly, America had drawn that line on waterworks on the ground that the water-supply of a city was closely allied to its sanitary conditions. The tendency, he thought, was for cities to take over the waterworks, and there seemed to be no objection from any quarter. England, on the other hand, had dashed ahead along some lines that Americans would regard as extremely hazardous. Thus one was surprised to find the London County Council running omnibus lines, erecting small but expensive electric plants to supply limited areas of street lamps, building tramways, planning extensive subways from Westminster to the Bank; while the water-supply of the greatest modern city was in the hands of private companies. Looking over the entire field, he found that about half the capital invested in English tramways was owned by municipal authorities, about one-third of the capital in gasworks, by far the largest portion of the capital in electric-light plants, but only half the municipal boroughs of England seemed to own their own waterworks. In making fiscal comparisons between corporation and company undertakings attention should be directed to the estimate of the taxes which a municipalised city lost by owning and operating its own profit-making undertakings. Take, for example, the Brooklyn Rapid Transit Company, which was paying over £200,000 annually as taxes. It had worked up a big business in transportation, had consolidated smaller tramways, paid the city nearly £40,000 annually for the privilege of carrying passengers from New York free across the Brooklyn Bridge, and if they wished would carry one twenty-two miles at good speed for the modest fare of 5c. (2½d.). Then, again, they had the Metropolitan Street Railway of New York carrying nearly 200,000,000 passengers on transfers free of cost—£2,000,000 thrown away, some people contend. The Union Traction Company of Philadelphia had made an estimate of their taxes, and, including the cost of the maintenance of paving, removal of snow and ice, and the interest on the original £2,800,000, and the cost of improved pavements laid by the company at the time the franchise was granted, this aggregated over £400,000 annually.

Keystones.

Change of Address.—Mr. Joseph Berry, architect, surveyor and valuer, has removed to 3, Market Place, Huddersfield.

A New Wesleyan Chapel at Newport, I.W., is being erected at Hunnyhill. The new building will be of red bricks with slated roof. Mr. S. E. Tomkins, of Newport, is the architect, and Messrs. G. Ball & Son are the contractors.

Workmen's Dwellings in Bermondsey.—The Bermondsey Borough Council propose to purchase for £25,000 the site of Messrs. Bryan, Donkin & Co.'s engineering works, Southwark Park Road, and erect blocks of workmen's dwellings at a cost of £30,200. The plans provide for 400 rooms, comprising forty three-roomed houses and 140 two-roomed dwellings.

The New Church of the Ascension at Stirchley has recently been consecrated. It is in the Decorated Gothic style, built of red bricks, with Bath stone dressings, and provides accommodation for over six hundred persons. The chancel has a waggon-shaped roof, and the choir vestry occupies the base of the tower on the south side, the organ-chamber being above. At the west end of the church is an apsidal baptistery. The total cost of the church and organ was £8,400. It is in this district that Mr. Cadbury's model village has been built, which to some extent accounts for the rapid increase in the number of residents.

A New Wesleyan Church at West Bridgford has been erected. It accommodates 300 persons. The entrance directly fronts on Trent Boulevard, the face being of Coxbench stone with Hollington stone dressings, the remainder of the structure being of pressed bricks. The edifice, which has cost about £2,000, has a length of 58ft. and a breadth of 31ft. The style is Perpendicular Gothic, with a large tracery window, and an entrance porch. A roof on the hammer-beam principle has been adopted. The whole of the woodwork, including the pews and roof, is of Canadian pine, and the heating is by hot water on the low-pressure system. At the rear is a church parlour, with classrooms overhead. Mr. A. E. Lambert was the architect, Mr. T. Barlow the contractor.

The Glasgow Technical College Architectural Craftsmen's Society held a meeting on Friday, November 22nd, Mr. John McKissack in the chair, when a paper entitled "Foreign Competition in the Building Trades" was read by Mr. George Herbertson, measurer. The essayist held that the restrictions put by the combined action of workmen on the importation of foreign-made joinery finishings and the like was contrary to the spirit of free trade which is the policy of this country. He suggested that for rolled steel beams and Portland cement a certain standard should be specified, and let the material come from where it might. He deprecated the proposed boycotting by slate-quarry masters in their attempt to keep out foreign slates. A discussion followed, opened by Mr. John Fairweather, A.R.I.B.A.

The Proposed New Buildings at Edinburgh Castle.—The Council of the Edinburgh Architectural Association have had under discussion the designs of these buildings, recently exhibited in the City Chambers. After having inspected the plans, the site and the probable effect from various points of view, and having fully considered the question, they resolved as follows: "The Council desires to express its sense of the courtesy of the War Office in giving the citizens an opportunity of seeing and discussing what is proposed to be erected on a site so unique in position as Edinburgh Castle. The Council feels most strongly that a site of its commanding position demands the most careful and skilful consideration, and although it is evident that no little attention has been directed to the preparation of the designs, the Council observes with great regret that from any point of view the outline of the great mass of the Castle and its buildings will be disfigured; and, further, that the general designs do not commend themselves as being in harmony with the better work on the Castle Rock. The Council trusts that, as this question is one of very great and permanent importance, nothing will be done without further serious consideration."

The Organ of St. Stephen's, Walbrook, closed since August for repairs and extension, has been reopened.

A New Church at Ilfracombe is proposed to be erected on the site of the present St. Peter's from plans by Mr. G. H. Fellowes Prynne.

Hogarth's House, Chiswick, together with about half an acre of garden attached, was sold by auction at the mart last week by Messrs. T. H. Currie & Co. for £1,500. It was built about 200 years ago, and occupied by William Hogarth from 1749 to 1764.

Mr. Walter Crane and Mr. Anning Bell have been invited to superintend the arrangement of the British section at the forthcoming Exhibition of Arts and Crafts in Turin. Eager as the Italians have shown themselves of late for exhibitions, this is a new departure on their part, and British decorative work should be represented to the best advantage.

A New Wesleyan Chapel and Schools at Worcester is being erected in Pump Street. The school buildings will be placed at the rear and will include an assembly-room and five classrooms, vestries and a ladies' parlour. The total outlay is estimated at £8,000. The architect is Mr. Jameson Green, of Liverpool, and the contractors are Messrs. Hopkins & Son, of Birmingham.

A New London Board School at Gospel Oak has been erected in Mansfield Road. It has been built on an exceptionally favourable site, being separated only by a railway from Parliament Hill Fields, which are over 300 acres in extent. The site was acquired sixteen years ago, and the immediate neighbourhood has in the meantime been covered with houses, one of the factors in the development of the district being the establishment of large engineering works in connection with the Midland Railway. The school will accommodate 800 children.

Leighton House.—At a recent meeting of the Kensington Borough Council the Libraries Committee brought up their report in reference to Leighton House. After some discussion the recommendation of the committee:—"That the council do consent, subject to satisfactory arrangements being made for the acquisition of the freehold as well as the leasehold interest, to take over the Leighton House and grounds on the terms laid down by the owners of the property, and that it be referred back to the committee to continue their negotiations on this basis"—was carried.

The Proposed Liverpool Cathedral.—At a meeting in aid of the Liverpool Cathedral fund, held at the Childwall Rural Deneary, Mr. Robert Gladstone, as representative of the Diocesan Committee, said that as to the style of architecture the committee were unanimously in favour of Gothic, but they had consented that the matter should remain open, and if the architects of England could create a new style and produce something more beautiful the committee would be pleased. It was stated that a Bill would be introduced in Parliament authorising the purchase of the selected site and also of the advowson of the rectory of Liverpool.

The Empire Music Hall, Swansea, in High Street, has just undergone extensive alterations for the Swansea Improvements and Tramways Company, and the hall will be reopened shortly under the name of "Palace of Varieties." New exits and entrances have been provided to each part of the house; sanitary arrangements have been renewed, verandahs have been fixed over all entrances, and the whole of the building, including bars, has been redecorated and refurnished. Electric light has been installed so that the building is up to date in every respect, and the safety and comfort of the public have been specially considered. The system of ventilation has been changed and a large motor fan substituted which will extract all smoke and foul air from the hall in a few minutes. The seating accommodation is about 600. The contractors for the work were: Messrs. J. & T. Weaver for the structural alterations, Mr. W. Evans for decorations, Mr. H. Coles for electric lighting, and the Domestic Supply Co. for the furnishing. The architects for the alterations were Messrs. Bucknall & Ellis, of Swansea, from whose plans the building was erected in 1887. The cost of the present alterations is about £4,000.

Battle Abbey Estate was sold last week to Sir Augustus Frederick Walpole Webster for £200,000.

The Cardiff, South Wales and Monmouthshire Architects' Society.—The meeting reported on p. 266 of our last issue was of the Associate (or Student) members of this Society.

Mr. C. J. Innocent, F.R.I.B.A., F.S.I., has taken into partnership his son, Mr. Charles Frederick Innocent, who has been associated with him several years. He is an associate of the Royal Institute of British Architects, having passed its final examination in 1896.

St. Andrew's Church, Bromley-by-Bow, is in need of gates to protect the outer doors of the church in a very rough locality (the handles having been wrenched off and other damage done), and £40 is required. Another £160 is needed to enlarge the present small and inadequate organ.

Dover Hospital is being extended as a local memorial to Queen Victoria. The work to be carried out includes a new out-patients' department, an isolation block and an operating theatre. The operating theatre is being built as the town's memorial to the late Sir Richard Dickeson, for many years president of the hospital.

The View from Richmond Hill: Middlesex County Council Object.—At a meeting of the Middlesex County Council held last week a resolution was passed that the proposal that the Council should contribute £12,000 towards the purchase of the Marble Hill estate was unacceptable, and that four members should be appointed to enquire into the best means for preserving the view from Richmond Hill.

A Discovery in Jerusalem.—The Greek Catholic monks, who are in possession of the chief portions of the Church of the Holy Sepulchre, are building a bazaar opposite it, where pilgrims may purchase souvenirs of their visit to Jerusalem. During the process of clearing the site the foundations of an old mediæval church, forty mètres long and thirty wide, with three apses, were discovered. A number of fine capitals, fragments of basalt pillars, and bas-reliefs, with symbolic animals, were found, all these remains having doubtless belonged to the choir of the church.

The Edinburgh Architectural Association held a meeting last Thursday, Mr. Henry F. Kerr, president, in the chair. Mr. Louis A. Barnier, B.A., delivered a lecture on "The Old Monuments of Provence," showing how the influence of Greek and Roman civilization began earlier and finished later than in the rest of the Gaul, and therefore left a stronger mark on the people, who have ever since preserved an individuality, and have been, so to speak, a nation apart from the rest of the French. Some of the monuments, Roman theatres, amphitheatres, temples, mausoleums, &c., in the following towns were specially mentioned: Orange, Avignon, Tarascon, and Beaucaire, Arles, Aignes, Mortis, Carcassone, and Nimes.

Statue to Queen Victoria at Hull.—The Hull Queen's Memorial Committee has unanimously selected the joint design for the Queen's memorial in the new City Square by Mr. H. C. Fabr, sculptor, and Mr. J. S. Gibson, architect, London, after the various models submitted for its consideration had been inspected. The design consists of a figure of the late Queen, 9ft. in height, clad in State robes, upon a pedestal, on each side of which is a figurative group of statuary illustrating Great Britain and the Mistress of the Seas and her dominion over land. Round the frieze of the pedestal will be an inscription of her Majesty's titles, while on the panels at the back and front in bas relief will be a symbolical old-world galleon and an ancient Greenland ship, whilst on the four corners of the pedestal are dolphins and over the cornice a representation of the city arms. The statuary and enrichment will be in bronze and the pedestal figures in Portland stone. The cost of the statue, apart from foundations, will be £2,700. The memorial, including the pedestal, will cost something like £3,000. The work it is expected will be completed by August next. The total height of the statue from the flag level will be 30ft., and cover at its base a space of 25ft. by 20ft.

The Exhibition of the Queen Victoria Memorial Designs at St. James's Palace will be closed after Saturday, December 7th.

Mr. Edward Forrest, an architect, in Douglas, died last week from a severe cut in the throat' evidently self-inflicted with a razor that was by his side.

Mr. Walter Long, President of the Local Government Board, received a deputation last week from the Association of Municipal Corporations. In reply to Sir A. K. Rollit, he said that, if the time for the repayment of loans were extended from forty to sixty years, there was not sufficient evidence to show that the rents would be brought within the reach of the very poor. He was hoping that some such evidence would be sent to him.

The Victoria Station Hotel, Nottingham, was opened recently. It has been built in connection with the Central Station, jointly owned by the Great Northern and Great Central Railway Companies, and has been designed by Colonel R. W. Edis. It is built of red bricks with stone dressings, surmounted by a lofty tower with tapering spire. On the ground floor the hotel has a central hall, with reception and business rooms on the one hand, whilst on the other hand access is obtained to a lounge, coffee-rooms, a smoking-room, reading-room and buffet. The billiard room is on a lower floor, and on the same level is the domestic department. From the ground floor a grand staircase leads to the upper floors, which are also reached by an electric lift. The building has been built, fitted and appointed throughout by Messrs. Maple & Co., Ltd.

Masters and Men.

Trade Unions and Free Labour.—An important judgment was given in the Philadelphia Courts last week in a case involving the question of the legal right of trade unions to compel contractors to employ only union labour. The council of the Allied Building Trades, a prominent labour organisation of the United States, had compelled certain contractors to discharge some plumbers who were not connected with that society under a threat of ordering a strike of the members of the Allied Building Trades. An injunction was applied for, and the Court has made an order restraining trade unions from ordering contractors to discharge members of societies not affiliated with the Allied Building Trades. The judgment also restrains officials of the latter organisation from approaching buildings where mixed labour is employed for the purpose of interfering with the contractor's arrangements.

Engineering Notes.

The New Chapel and School at Summerhill, near Wrexham, have lately been fitted with the well-known "Small Tube" hot-water heating apparatus by Messrs. John King, Ltd., engineers, Liverpool.

The Brighton Corporation Electric Tramways were opened recently. They have been laid down on the overhead trolley system at a cost of £175,000, and practically cover the borough from the Pavilion northwards. There are four sections, known as the Lewes Road, Elm Grove, Ditchling Road and New England Road routes, but only the first-named has been opened. It is anticipated, however, that the whole system will be in use within a week.

Electric Railways to Brighton.—Major Cardew and Mr. Philip Dawson have been retained as consulting electrical engineers to the London, Brighton and South Coast Railway Company. Though the company does not contemplate the promotion of a Bill in Parliament for the conversion of the line to an electric railway in the immediate future, the appointment has been made with that end in view. The company has already considerable electric works of other kinds. Also expert advice is desirable in regard to what the general manager calls "fantastic" schemes of electrical traction to Brighton which may come before Parliament. Mr. W. Emden, L.C.C., is preparing designs for the terminus at Brighton of the proposed Brighton Electric Railway.

Trade and Craft.

Geysers.

A new illustrated catalogue of geysers and instantaneous water-heating appliances has been issued by Messrs. Ewart & Son, Ltd., of 346, 348 and 350, Euston Road, London, N.W. On pp. 12 to 15 is illustrated the "Califont" geyser, which is their most important novelty. It instantly supplies hot water under high pressure, without circulation, if desired feeding a tap above or below the level of the apparatus and at any distance, with a flow of water averaging from 1 to 8 gallons per minute. This geyser gives an adequate hot-water service to any number of taps. On pp. 2 and 3 the "Lightning" geyser is shown. To the usual stock sizes larger ones have been added, rapidly heating water in big quantities for baptistries, factories, &c. On p. 6 a convenient combination of geyser with shower-bath arrangement and lavatory supply is illustrated. The "Champion" geysers, sizes "X" and "Z," are very powerful inexpensive heaters, useful for bottle washing, laundries, &c. Page 23 illustrates a satisfactory and reliable geyser heated by oil, for which there are many enquiries. The "Success" geyser has been on the market for a few years, but has recently been improved. The "Bar" geyser (p. 30) shows a new departure in water-heating. Special arrangements are made for the easy removal of fur deposited by boiling water, and a patent controlling valve is provided by which a supply of boiling water is always maintained for restaurant use or tea-making purposes. On p. 31 is illustrated the "Albany" gas circulating boiler for connection with radiators, greenhouse pipes, &c. On p. 27 information and a sketch are given showing how to deal with the trouble which takes place in vent pipes, caused by downdraught; and some interesting bathroom sundries and fittings are shown on pp. 28 and 40.

Vulcanite Roofing.

The Patent Vulcanite Roofing and Asphalte Co., Ltd., of 2, New Union Street, London, E., draw attention to the following information regarding their patent roofing, which takes the place of asphalt, copper, lead or zinc. When completed it is entirely one flat surface, without seam or joint, requiring no drips or rolls; and, moreover, it is cheaper and more fireproof than slated or tiled roofs, and is perfectly waterproof and dustproof. Its efficiency is testified by the fact that it is now used by the War Office and the Admiralty, after the strictest examination by the Government surveyors. The following are the principal advantages of vulcanite roofing: The roof being arranged in an almost horizontal position, the area is reduced to the least possible extent, affording a great saving in the outlay on timber and wages. The boarding may also be used as a ceiling, still giving good rooms immediately under the roof. The construction is not only simple but adapts itself easily to the most complicated forms of ground plan, and the vulcanite roofing is also particularly suitable for the tops of Mansard roofs. It is claimed that the temperature in the rooms beneath a vulcanite roof is in summer and winter more even than under any other roof; and the material being bituminous, horn-like and elastic, while retaining its elasticity permanently, becomes in course of time of a metallic hardness and is absolutely impervious. It is a fire-resisting roofing of the first order, because the layer of gravel or soil is a protection against any burning objects and the hermetically-closed roof offers the greatest possible resistance to the spread of a fire, as it stifles the flames. Possessing these advantages, it demands inspection by all architects. Some time ago an appeal case was heard before Mr. Justice Grantham and Mr. Justice Channel in which the question was raised as to whether vulcanite roofing was incombustible within the meaning of the London Building Act. The justices of Edgware decided that the material was more fire-resisting than slates, metal, &c., and Mr. Justice Graham upheld this decision. The compliance of the patent vulcanite roofing material with the building by-laws is thus established, as no further appeal against this judgment is possible.

ANCIENT LIGHTS.

Mr. LEIGH CLARE pointed out in a recent lecture on "Some Points in the Law of Prescription," delivered in the Inner Temple Hall, that prescription is one of the oldest branches of the law, and goes as far back as legal memory can go. It is based on the principle that, when a man has exercised openly and for a long time without dispute any particular right, the law assumes that his action is rightful and not wrongful. Broadly speaking, this is a very wise and just principle, but, like all other general laws, it is inevitably open to some abuse. Mr. Leigh Clare asserts that its greatest defect arises in connection with ancient lights. The great drawback to the operation of this law is that in some cases the right to light is used out of all proportion to the value of the light which is claimed. Mr. Clare's opinion is that the courts should be invested with the power of saying that where the inconvenience and loss to the owner of an ancient light is infinitesimal compared with the injury which the exercise of the right would inflict, either upon a neighbour or the general public, it was a question of compensation and not, as at present, of injunction. Mr. Clare would have Parliament interfere in this matter, and impose upon our legislators the task of finding a remedy for what is sometimes an injustice. Sir Francis Jeune, however, is not so confident of Parliament finding a remedy or of the wisdom of leaving the subject to the Legislature.

CURRENT MARKET PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	—
Clover, best	per load	4 15 0	5 10 0
Hay, best	do.	5 5 0	5 15 0
Sainfoin mixture ..	do.	4 10 0	5 5 0
Straw	do.	1 8 0	1 18 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 7 0	1 8 7
Colza Oil, English ..	do.	1 7 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 7 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do	1 0 4½	—
Linseed Oil, barrels ..	do	1 11 0	—
Petroleum, American ..	per gal.	0 0 7	0 0 7¼
Do. Russian ..	do.	0 0 6⅝	0 0 6¾
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	6 5 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 9 6	1 10 0
Tar, Stockholm	per barrel	1 4 6	—
Turpentine	per cwt.	1 6 9	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	80 0 0	—
Iron, Staffs., bar ..	do.	6 10 0	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 0 0	11 10 0
Lead, pig, Soft Foreign..	do.	11 2 6	11 3 9
Do. do. English common brands	do.	11 10 0	—
Do. sheet, English 3lb per sq. ft. and upwards	do.	14 0 0	—
Do. pipe	do.	14 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	6 15 0	—
Do. floor brads	do.	9 10 0	—
Steel, Staffs., Girders and Angles	per ton	6 0 0	6 5 0
Do. Do. Mild bars	do.	6 15 0	7 5 0
Tin, Foreign	do.	113 0 0	113 10 0
Do. English ingots ..	do.	116 0 0	—
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	16 12 6	17 0

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec, Yellow ..	do.	4 7 6	6 0 0
Do. Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 10
Do. Petersburg ..	per bundle	0 0 9	0 0 0½
Deals, Archangel 2nd & 1st	per P. Std.	9 10 0	14 15 10
Do. do. 4th & 3rd	do.	7 15 0	8 0 0
Do. do. unsorted	do.	5 12 6	6 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	14 0 0	—
Do. do. 2nd „	do.	12 10 0	—
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	do.	13 15 0	16 15 0
Do. White Sea ..	do.	8 5 0	16 5 0
Do. Quebec Pine, 1st ..	do.	27 5 0	—
Do. do. 2nd ..	do.	12 15 0	13 0 0
Do. do. 3rd &c.	do.	9 10 0	—
Do. Canadian Spruce, 1st	do.	10 10 0	11 10 0
Do. do. 3rd & 2nd	do.	6 17 6	8 15 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds	do.	5 10 6	11 5 0
Flooring Boards 1in. prepared, 1st ..	per square	0 14 6	—
Do. 2nd ..	do.	0 10 0	—
Do. 3rd &c. ..	do.	0 9 3	—

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Dec.	5	Warwick—Infirmary (151 Inmates and Staff)	Union Guardians	F. P. Trepass, 8 Jury Street, Warwick.
„	5	London, W.—Block of Offices, Stabling and Tenements	Wilts United Dairies, Ltd.	Pilditch, Chadwick & Co., 2 Pall Mall East, Charing Cross, W.C.
„	5	Barnsley—Three Dwelling Houses, Stables, &c.	———	Smith & Clegg, 15 Regent Street, Barnsley.
„	5	London, N.E.—Offices and Coal Stores for Municipal Electricity Works.	Hackney Borough Council	Gordon & Gunton, Architects, Finsbury House, E.C.
„	5	Oswestry—Business Premises	———	W. H. Spaull, Architect, The Gables, Oswestry.
„	5	Rodley, Leeds—Filtration Tanks	———	W. D. Gill, 2 Summerville Terrace, Stanningley.
„	5	Sedbergh, near Kendal—Farm Buildings	Grammar School Governors	S. Shaw, Architect, Kendal.
„	5	York—Alterations, &c., to Working-Men's Club	———	Secretary, Barton Lane Working Men's Club, Bootham Crescent, York.
„	5	Sligo—Portland Cement, Limestone, &c.	Harbour Commissioners	T. J. Mercer, Secretary, Harbour Office, Sligo.
„	5	Cardiff—Jobbing Works	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
„	6	Halifax—Alterations, &c., to Bakery	Industrial Society	M. Hall, 29 Northgate, Halifax.
„	6	Dublin—Cement, Barrows and Trucks, Ladders, &c.	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier Street, Dublin.
„	6	Croydon—Extension to Polytechnics	Town Council	Deputy Borough Engineer, Town Hall, Croydon.
„	6	Hull—New Premises	R. Field & Son, Ltd.	Broderick, Lowther & Walker, 77 Lowgate, Hull.
„	7	Bradford—Warehouse	———	S. Jackson & Son, Architects, Tanfield Chambers, Bradford.
„	7	Blaenavon, Mon.—Sliding Partitions, &c., at Schools (Two Contracts).	School Board	Lansdowne & Griggs, Architects, Metropolitan Bank Chambers, Newport, Mon.
„	7	Annfield Plain, Durham—Additions to Mixed School	Kyo School Board	G. T. Wilson, 121 Durham Road, Blackhill.
„	7	Huddersfield—Additions to Tramway Power Station	Corporation	Borough Engineer, 1 Peel Street, Huddersfield.
„	7	Rochdale—Two Cloakrooms at Hall	Carters' and Lurrymen's Union	G. Wright, 635 Oldham Road, Rochdale.
„	9	York—Glass, Portland Cement, &c.	North Eastern Railway Company	E. H. Clark, Stores, Gateshead.
„	9	King's Langley, Herts—Alterations, &c., to Convalescent Home.	Metropolitan Asylums Board	Surveyor, Board's Offices, Embankment, E.C.
„	9	Hull—Mansions for Working Men	———	Gelder & Kitchen, 76 Lowgate, Hull.
„	9	Belfast—Villa	———	W. J. Fennell, Scottish Provident Buildings, 2 Wellington Place, Belfast.
„	9	Bideford—Infirmary Buildings at Workhouse	Union Guardians	R. T. Hookway & Son, Architects, Bridgeland Street, Bideford.
„	9	Bishop Auckland—Alterations to Theatre	———	F. H. Livesay, Architect, Bishop Auckland.
„	9	London, N.E.—Bandstand	London County Council	General Section, Architect's Department, County Hall, Spring Gardens, S.W.
„	9	Bodringallt, Wales—Schools	Ystradyfodwg School Board	J. Rees, Architect, Hillside Cottage, Pentre.
„	9	Middlesbrough—County Court	Commissioners of H.M. Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
„	9	Wolverhampton—Ice Factory and Cold Stores	Markets Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„	9	Wolverhampton—Alterations, &c., to Town Hall	Council	F. T. Book, Architect, Weelfoun Chambers, Darlington Street, Wolverhampton.
„	9	Erith—Engine and Boiler House, Chimney Shaft, &c.	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
„	10	Conisborough—Isolation Hospital	Doncaster and Mexborough Joint Hospital Board.	J. H. Morton, 50 King Street, South Shields.
„	10	Kirkcross and Brigham—Lime Quarry Working	———	Allerdale Coal Co., Ltd., Workington.
„	10	Chiswick, S.W.—Additions at Polytechnic	Middlesex County Council	H. T. Wakelam, County Architect, The Guildhall, Westminster, S.W.
„	10	London, S.W.—Four Maisonette Houses	———	F. & W. Stocker, 90 & 91 Queen Street, Cheapside.
„	10	London, W.C.—Superstructure of Three Blocks of Workmen's Dwellings.	London County Council	Architect's Department, Housing Branch, 18 Pall Mall East, S.W.
„	10	Barking—Portable Floor to Swimming Bath	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
„	10	Hull—Junior Department at School	School Board	B. S. Jacobs, Architect, Lincoln's Inn Bldgs., Bowlalley Lane, Hull.
„	11	Dover—Bricks, Lime, Glass, Cement, &c.	Harbour Board	W. Mowll, 36 Castle Street, Dover.
„	11	London, S.E.—Boundary Wall at Schools	Lambeth Guardians	W. Thurnall, Clerk, Offices, Brook Street, Kennington Road, S.E.
„	11	Carlow, Dublin—Additions to Lunatic Asylum Chapel	Committee of Management	T. F. M'Namara, 50 Dawson Street, Dublin.
„	11	Billinghurst—Two Detached Houses	W. H. Puttock	W. Buck, Architect, Horsham.
„	12	Nottingham—Bricks, Lime, Cement, &c.	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
„	13	Winchfield—Alterations, &c., to Workhouse Infirmary	Union Guardians	H. T. Sugden, Architect, Eversley, Winchfield.
„	14	Alnwick—School	———	J. W. Douglas, 40 Bondgate, Alnwick.
„	14	Kirkcaldy, Scotland—Electric Generating Station	Corporation	W. L. Mackindoe, Town Clerk, Kirkcaldy.
„	14	Cavenham Hall, Suffolk—Farm Buildings	A. B. H. Goldschmidt	P. M. Beaumont, Architect, Maldon, Essex.
„	14	Ulting, Essex—House	H. N. Falkner	P. M. Beaumont, Architect, Maldon, Essex.
„	14	Somercoates—Additions, &c., to Premises	S. T. Watson	G. W. Bird, Architect, Ripley, Derby.
„	16	Hull—Pavilions and Alterations at Infirmary	Royal Infirmary Board	J. Watson, Surveyor, Cogan Chambers, Bowlalley Lane, Hull.
„	16	Macclesfield—Additions, &c., to Public Baths	Corporation	Borough Engineer, Town Hall, Macclesfield.
„	16	Sevenoaks—Isolation Hospital	Urban District Council	W. H. Ansell, 11 Great James Street, Bedford Row, W.C.
„	17	Tywardreath, Cornwall—Schools	School Board	J. Cook, Clerk, Tywardreath, Par Station, Cornwall.
„	18	Great Stanmore, Middlesex—Isolation Hospital	Hendon Rural District Council	J. A. Webb, Surveyor, Great Stanmore.
„	18	Swinefleet, near Goole—Police Station	West Riding County Council	J. V. Edwards, County Surveyor, Wakefield.
„	18	Plumstead—Boundary Wall (550ft.)	Woolwich Union Guardians	J. O. Cook, 1A Eleanor Road, Woolwich.
„	18	Leeds—Engine Shed, Workshops, Offices, &c.	North Eastern Railway Company	W. Bell, Company's Architect, York.
„	21	Reading—Electric Power Station	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
No date.		Kingswood, Bristol—Factory	Bees & Potter	Bees & Potter, Kingswood, Bristol.
„		Watford—Boys' Department at School	School Board	J. Hunt, 40 Upper Baker Street, London, N.W.
		ENGINEERING:		
Dec.	5	Warwick—Steam, Cooking, &c., Apparatus & Fittings	Union Guardians	F. P. Trespass, 8 Jury Street, Warwick.
„	5	Biggleswade—Hand Pump for Cesspools	Rural District Council	J. Owen-Jones, Surveyor, Biggleswade.
„	5	Birkenhead—Two Lancashire Boilers	Corporation	J. W. M. Richardson, Water Engineer, Town Hall, Birkenhead.
„	5	Birmingham—Bridge Reconstruction, &c.	Public Works Committee	J. Price, City Engineer, Council House, Birmingham.
„	5	Huddersfield—Steel Girder Bridge	Corporation	Town Clerk, Town Hall, Huddersfield.
„	5	Southampton—Reconstruction of Quay, Landing Steps	Harbour Board	W. Bowyer, Clerk, Harbour Office, Town Quay, Southampton.
„	5	Withington, Lancs—Kitchen Equipment	Urban District Council	J. B. Broadbent, 15 Cooper Street, Manchester.
„	5	Youghal—Extension of Sewerage Scheme	Urban District Council	J. J. O'Shea, Clerk, Town Hall, Youghal.
„	6	Hull—Construction of New Dock (50 acres)	Joint Dock Committee	Sir J. Wolfe Barry & Partners, 21 Delahay Street, Westminster.
„	6	Croydon—Heating Polytechnics	———	Deputy Borough Engineer, Town Hall, Croydon.
„	7	Burnley, Lancs—Electric Lighting Plant	Union Guardians	Shepherd & Watney, Consulting Engineers, Greek St. Chmbrs, Leeds.
„	9	York—Telegraph Shores	North-Eastern Railway Co.	Mr. Graves, Telegraph Department, York.
„	9	Huddersfield—Electric Tramways	Corporation	K. F. Campbell, Borough Engineer, Town Hall, Huddersfield.
„	9	Preston, Lancs—Laundry Heater	Union Guardians	Mr. Whitwell, Engineer, Fulwood Workhouse, Preston.
„	9	London, W.C.—Light Radiators	School Board	Contracts Sub-Dept., School Board Offices, Victoria Embankment.
„	10	London, N.E.—Water Supply at Workhouse	Bethnal Green Board of Guardians	G. H. Hughes, 97 Queen Victoria Street, E.C.
„	10	London, S.W.—Twelve Fire Escapes	London County Council	Clerk, County Hall, Spring Gardens, S.W.
„	10	Bradford-on-Avon, Wilts—Filter Bed at Waterworks	Urban District Council	S. Howard, Waterworks Engineer, Town Hall, Bradford-on-Avon.
„	11	Birkenhead—Laying 6½ miles of 14-in. Pumping Main	West Cheshire Water Co.	W. M. Jones, 9 Hamilton Square, Birkenhead.
„	11	Bideford—Lighting	Urban District Council	W. B. Seldon, Town Clerk, Bideford.
„	13	Chesterfield—Storage Reservoir	Rural District Council	R. F. Hartwright, Clerk, Union Offices, Chesterfield.
„	13	Bakewell, Derbyshire—Waterworks	Rural District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
„	13	Maidenhead—Electric Lighting Plant	Corporation	Burstall & Monkhouse, 14 Old Queen Street, Westminster, S.W.
„	14	Pontypridd—Electric Plant for Power Station	Urban District Council	R. P. Wilson, Engineer, Council Offices, Pontypridd.
„	14	Southampton—Electric Motors	Director-General of Ordnance Survey	Preece & Cardew, 8 Queen Anne's Gate, Westminster.
„	16	Towcester—Water Supply Works	District Council	W. Whitton, Clerk, Towcester.
„	16	Ireland—Single Railway Line Viaduct over River Barrow.	Fishguard and Rosslare Railways and Harbours Co.	Sir B. Baker, 2 Queen Square Place, Queen Anne's Mansions, Westminster, S.W.
„	17	Bury, Lancs—Sewage-Disposal Works	Sewage Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
„	17	Rochdale—Goods Yard, Widening Bridge, &c.	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
„	17	Stourbridge—Three Purifiers, &c.	Gas Committee	W. North, Engineer, Gas Works, Stourbridge.
„	17	Entwistle, near Bolton—Widening Railway	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
„	31	Littleton, Middlesex—Bridge across River Ash	County Council	H. T. Wakelam, County Engineer, The Guildhall, Westminster.
„	31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
1902.				
Jan.	1	Lower Egypt—Lock Gates for Ziftah Barrage Works	Inspector-General of Irrigation	Inspector-General of Irrigation, Lower Egypt.
„	6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
„	6	Nantwich, Cheshire—Electric Plant	Urban District Council	Under-Secretary for Public Works, Sydney.
„	7	Manchester—Laying Waterpipes from Thirlmere to Manchester.	Corporation	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
„	10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	G. H. Hill & Sons, 3 Victoria Street, Westminster.
Feb.	28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
Mar.	31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
Dec. 5	Cardiff—Cast-iron Street Surface Covers, &c.	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
" 5	London, E.C.—Steel and Iron Footbridge	Great Indian Peninsula Rly. Co.	J. L. Berry, Secretary, 48 Copthall Avenue E.C.
" 5	Chatham—Street Gratings and Manhole Covers, &c.	Town Council	C. Day, Borough Surveyor, Town Hall, Chatham.
" 5	Sligo—Stores	Harbour Commissioners	T. J. Mercer, Secretary, Harbour Office, Sligo.
" 6	Dublin—Iron Stores, &c.	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier St., Dublin.
" 7	Hetton-le-Hole, Durham—Colliery Stores	Coal Co., Ltd.	J. Laverick, Hetton Colliery, Hetton-le-Hole, R.S.O.
" 9	York—Stores	North-Eastern Railway Co.	E. H. Clark, Stores, Gateshead.
" 9	Aberaman, near Aberdare—Stores	Powell Duffryn Steam Coal Co., Ltd.	Stores Manager, Aberavon Offices, near Aberdare.
" 9	South Hetton, Sunderland—Colliery Stores & Castings	Coal Co., Ltd.	J. R. Lambert, South Hetton, Sunderland.
" 9	York—Telegraph Stores	North-Eastern Railway Co.	Mr. Graves, Telegraph Department, York.
" 9	South Hetton, Sunderland—Iron Castings, Wire Ropes	Coal Co., Ltd.	J. R. Lambert, South Hetton, Sunderland.
" 10	London, E.C.—Stores	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Secretary, Gloucester House, Bishopsgate St. Without.
" 11	Dover—Iron, Steel, Ironmongery, &c.	Harbour Board	W. Mowll, 36 Castle Street, Dover.
" 11	Dublin—Iron Castings, Ironmongery, &c.	Port and Docks Board	N. Proud, Secretary, Port & Docks Office, Westmoreland St., Dublin
" 12	Nottingham—Iron Castings, Ironmongery, &c.	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
" 14	Trimdon Grange, Durham—Colliery Stores	——	Storekeeper, Trimdon Grange Colliery, Durham.
" 18	Leeds—Iron and Steel Work in Engine Shed, &c.	North Eastern Railway Company	W. Bell, Company's Architect, York.
" 20	Glasgow—Steel Rails, &c.	Corporation	J. Young, 86 Renfield Street, Glasgow.
	PAINTING AND PLUMBING:		
Dec. 5	Cardiff—Lead Service Work, &c.	Corporation	C. H. Priestly, Waterworks Engineer, Town Hall, Cardiff.
" 5	Sligo—Varnish, Red Lead, Oil, &c.	Harbour Commissioners	T. J. Mercer, Secretary, Harbour Office, Sligo.
" 6	Glasgow—Oil, Paints, White & Red Lead, Varnish, &c.	Messrs. Burns	Messrs. Burns, 30 Jamaica Street, Glasgow.
" 6	Dublin—Brushes, Oils, Plumbing Work, White Lead, &c.	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier St, Dublin.
" 9	King's Langley, Herts—Painting at Convalescent Home	Metropolitan Asylums Board	Surveyor, Board's Offices, Embankment, E.C.
" 9	York—Lead, White and Red Lead, Oils, Brushes, &c.	North-Eastern Railway Co.	E. H. Clark, Stores, Gateshead.
" 11	Dover—Paint, Oil, &c.	Harbour Board	W. Mowll, 36 Castle Street, Dover.
" 11	Dublin—Paints, Oils, White and Red Lead, &c.	Port and Docks Board	N. Proud, Secretary, Port & Docks Office, Westmoreland St., Dublin.
" 12	Nottingham—Brushes, Plumbers' Work	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
" 14	London, S.E.—Sheet Lead Pipes & Painters' Materials	Guy's Hospital	Superintendent, Guy's Hospital, S.E.
" 20	Chatham Downs, near Canterbury — Painting and Decorating.	County Lunatic Asylum Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
No date.	Nottingham—Cleaning and Painting Schools	School Board	W. J. Abel, Clerk, School Board Offices, Victoria Street, Nottingham
	ROADS AND CARTAGE:		
Dec. 5	Chatham—Gravel, Crushed Ragstone, &c.	Town Council	C. Day, Borough Surveyor, Town Hall, Chatham.
" 5	Woolwich—Tar Macadam Works	Borough Council	F. Sumner, Borough Engineer, Massey Road, Plumstead.
" 7	Church, Lancs—Paving, &c	Urban District Council	Surveyor, District Council Office, Church.
" 7	Northampton—Broken Granite, Setts, &c.	Highways Committee	W. J. Brown, Borough Surveyor, Guildhall, Northampton.
" 7	Southowram, near Halifax—Flagging Playground	School Board	J. T. Morton, Clerk, Argyle Street, Halifax.
" 9	Bootle—Street Improvement Works	Corporation	Borough Engineer, Town Hall, Bootle.
" 9	Erith—Approach Roads to Electric Light Station	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
" 9	Hale, Cheshire—Making-up Road	Urban District Council	F. J. Lobley, Surveyor, Ashley Road, Hale.
" 9	New Brompton, Kent—Roadmaking, &c.	Football Club Co., Ltd.	W. I. Groombridge, 177 Balmoral Road, New Brompton.
" 9	Beckenham—Quartzite	Urban District Council	J. A. Angell, Surveyor, Council Offices, Beckenham.
" 9	Woodford—3 Slop Carts and Horse Road Sweeper	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green, Essex.
" 10	West Ham, E.—Making-up Streets	Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 10	Croydon—Repair of Roads	Borough Council	Borough Road Surveyor, Town Hall, Croydon.
" 11	Dublin—Broken Stone, Paving Setts, &c.	Port and Docks Board	N. Proud, Secretary, Port & Docks Office, Westmoreland St., Dublin.
" 11	London, S.W.—Making-up and Paving Streets	Fulham Borough Council	C. Botterill, Borough Surveyor, Town Hall, Fulham, S.W.
" 12	Nottingham—Materials	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
" 12	Londonderry—Paving Setts	Corporation	City Surveyor, Guildhall, Londonderry.
" 14	London, S.E.—Sand, Ballast, and Rubbish Cartage	Guy's Hospital	Superintendent, Guy's Hospital, S.E.
" 16	Hastings—Brooms and Brushes	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 17	Rochdale—Road	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
	SANITARY;		
Dec. 5	Bradford—500 tons of Lime	Gas Committee	Town Clerk, Bradford.
" 5	Spondon, Derbyshire—Scavenging	Sharlow Rural District Council	J. W Newbold, Clerk, Becket Street, Derby.
" 6	Grimsby—Bottles for Sanitary Department	Sanitary Committee	Town Clerk, Grimsby.
" 7	Thornton-le-Moor, Yorks — Sewerage and Sewage Disposal Works.	Thirsk Rural District Council	Fairbank & Son, 13 Lendal, York.
" 9	Erith—Sanitary Work, Drains, &c.	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
" 9	Bridgend—Sewerage Work	Urban District Council	M. Williams, Engineer to Council, Station Road, Bridgend.
" 9	Bridgend—Sewerage Materials	Urban District Council	M. Williams, Engineer to Council, Station Road, Bridgend.
" 9	Hendon—Pipe Sewer and Drain	Urban District Council	S. S. Grimley, Engineer to Council, Hendon.
" 12	Nottingham—Pipes, Scavenging Brushes, &c.	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
" 13	Devonport—Pipe Sewers, &c.	——	J. F. Burns, Borough Surveyor, Devonport.
" 14	Wantage, Berks—Sewerage & Sewage Disposal Works	Urban District Council	Cameron, Conuwiu & Martin, 7 & 8 Bedford Circus, Exeter.
" 16	Sutton Coldfield—Pipe Sewer, &c.	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
" 16	London, N.—Sewers, &c.	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
" 17	Bury, Lancs—Sewage-Disposal Works	Sewage Committee	A. W. Bradley, Borough Surveyor, Bury, Lancs.
Jan. 6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
	TIMBER:		
Dec. 5	Sligo—Timber	Harbour Commissioners	T. J. Mercer, Secretary, Harbour Office, Sligo.
" 6	Dublin—Timber	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, D'Olier St., Dublin.
" 6	Warwick—Wood	Union Guardians	C. H. Passman, 48 Bedford Street, Leamington Spa.
" 9	Aberaman, near Aberdare—Timber	Powell Duffryn Steam Coal Co, Ltd.	Stores Manager, Aberavon Offices, near Aberdare.
" 9	Llanelly—Two Timber Jetties	Navigation Commissioners	H. W. Spowatt, Clerk, Harbour Office, Llanelly.
" 11	Dublin—Planks and Deals	Port and Docks Board	N. Proud, Secretary, Port & Docks Office, Westmoreland St., Dublin.
" 11	Dover—Timber	Harbour Board	W. Mowll, 36 Castle Street, Dover.
" 12	Nottingham—Timber	Corporation	A. Brown, City Engineer, Nottingham.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 17	Tywardreath—Board Schools	——	J. Cook, Clerk to School Board, Tywardreath, Par Station, Cornwall
" 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902. Jan. 1	Gillingham, Kent—Laying-out Recreation Ground	£20, £10 & £5.	F. C. Boucher, Clerk to U.D.C., Gardiner St., New Brompton, Kent.
" 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
" 15	Kirkcaldy—Elementary School (400 pupils)	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
" 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
May 1	Melbourne, Victoria—Memorial Statute to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St, Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Leigh, Lancs—Infirmary or Cottage Hospital	£30, £20, £10.	J. H. Box, Hon. Sec., Infirmary Committee, Leigh, Lancs.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BECKENHAM.—For the erection of two firemen's cottages, together with a room to contain a hose-cart, situate in Station Road, Shortlands, Beckenham, for the Beckenham Urban District Council. Mr. John A. Angel, surveyor:—

General Builders, Ltd., Wharf Road, Notting Hill	£2,176
H. Chapman, Glebe Road, Bromley, Kent	1,768
Thomas & Edge, Anglesey Road, Woolwich	1,699
Foster Bros., St. Mary's Road, Norwood	1,567
W. Wallis, Ramsden Road, Balham	1,521
Barden & Head, 12 Union Street, Maidstone	1,490
A. P. Poingdestre, Gwydyr Road, Bromley, Kent	1,432
P. Orpin, 14 Minden Road, Anerley	1,326
H. Heathfield, Kent House Road, Beckenham	1,316

CARLISLE.—For the construction of underground lavatories, Market Place, for the Corporation. Mr. H. C. Marks, C.E., borough engineer, 36 Fisher Street, Carlisle. Quantities by engineer:—

J. & R. Bell	£1,375	10	0
Batey & Sons	1,375	0	0
J. Beaty	1,373	19	7
Beaty Bros.	1,360	0	0
J. Laing,* Milbourne Street	1,338	0	0

* Accepted. [Engineer's estimate, £1,350.]

CHALFORD (GLOS.).—For the erection of an infants' school at Chalford Hill, with work incidental thereto, for the Chalford School Board. Mr. V. A. Lawson, architect, 17 Rowcroft Stroud:—

A. S. Cooke, Pagan Hill, Stroud	£1,066	14	6
A. King & Sons, Gloucester	1,645	0	0
Orchard & Peer, Stroud	1,590	0	0
Drew Bros.,* Chalford, Stroud	1,532	0	0

* Accepted.

CONISBOROUGH (YORKS.).—For the erection of mixed school, and caretaker's house and Board-room. Mr. Geo. White, A.M.I.C.E., architect, Mexborough:—

Mixed School.

W. Johnson	£4,485	12	0
J G. Cooling	4,247	19	0
G. H. Smith	4,079	19	0
D. Gill & Son	3,992	0	0
M. Grantham	3,953	0	0
Mullins & Richardson	3,853	17	0
B. Wortley	3,784	9	0
Earnshaw Bros.*	3,739	12	2

House.

G. H. Smith	£580	12	0
M. Grantham	555	0	0
W. Johnson	540	10	0
Mullins & Richardson	530	12	0
Earnshaw Bros.*	523	14	0
D. Gill & Son	480	0	0
B. Wortley	448	10	0

* Accepted.

DOVER.—For the erection of a public-house and premises in the Elms Road, for Messrs. Thompson & Son, Ltd. Messrs. Edward W. Fry & Miller, architects, Cannon Street, Dover:—

Hayward & Paramor	£1,690
Goldsmith & Tapley	1,670
Lewis & Sons	1,635
W. Bromley	1,553
Warren & Son	1,548
J. Parsons	1,537
Austin & Lewis*	1,498

* Accepted.

FLEETWOOD (LANCS.).—For building and construction of a new pavilion or public shelter, and other works in connection therewith, for the Urban District Council. Mr. E. Frobisher, A.M.I.C.E., surveyor:—

J. C. Barnes, Victoria Street	£1,316	17	9
Lancaster & Atkinson, Lower London Street	1,308	3	7
Blackburn & Hastings, Osborne Road Sawmills, South Shore, Blackpool	1,289	0	0
J. Parkinson & Sons, Kent Street Sawmills, Blackpool	1,214	7	10
T. Riley, North Albert Street	1,212	11	1
Portable Building Co., Ltd., Preston Street	1,149	1	2

[Rest of Fleetwood.]

ILKESTON.—For the erection of shop premises and additions to property in Station Road, Ilkeston, for Mrs. A. Woolliscraft. Messrs. Geo. Haslam, M.S.A., & Son, architects, Euclid House, Ilkeston:—

Thos. Hallam	£415	0
W. V. Ireson	410	15
Hazlewood & Masson	408	0
Alfred Earnshaw	400	0

* Accepted.

LITTLEHAMPTON.—For pumping plant at Warningcamp Waterworks, for the Littlehampton Urban District Council. Mr. H. Howard, engineer:—

Mather & Platt, Ltd., Salford Ironworks, Manchester	£5,020
Simpson & Co., 101 Grosvenor Road, London, S.W.	4,950
Glenfield & Kennedy, Kilmarnock	3,730
Simpson & Co.*	3,600
Hydraulic Engineering Co., Chester	3,256
Warner & Co., Walton-on-Naze	3,217
Timmins & Sons, Bridgewater Foundry, Runcorn	3,180
Hydraulic Engineering Co.	2,714

* Accepted.

LONDON, N.—For sewerage works at the Rookfield Estate, Muswell Hill, N., for the Hornsey Urban District Council. Mr. E. J. Lovegrove, surveyor:—

R. Jackson, Stroud Green, N.	£7,127	6	6
Myers, Gilson, & Rose, Ltd., Hornsey, N.	6,961	10	7
J. A. Dunmore, Crouch End, N.	6,948	1	1
Wilkinson Bros., Finsbury Park, N.	6,800	0	0
C. Ford, Harlesden, N.W.	6,489	0	0
E. Rogers & Co., St. Lawrence Road, W.	6,427	0	0
T. Adams, Wood Green, N.	6,356	18	10
E. T. Bloomfield, Tottenham, N.	6,084	0	0
F. J. Coxhead, Leytonstone	5,989	0	0
Johnson & Langley, Leicester	5,960	0	0
D. R. Paterson, Camden Town, N.W.	5,656	10	0
G. W. Killingback & Co.,* Camden Town, N.W.	5,177	18	8

* Accepted.

LONDON, S.E.—For the erection of new offices, &c., 246 Rotherhithe Street, S.E., for Messrs. Bellamy's Wharf, Ltd. Mr. John James Downes, architect, 199 Lewisham High Road, New Cross, S.E.:—

Chalkley	£2,600
Jerrard & Sons	2,184
S. R. Best	2,147
T. D. Leng	2,118

LONDON, S.W.—For the erection of offices and shops, Brixton Hill, S.W., for Mr. W. H. Daw. Messrs. Dale & Gadsdon, architects, 8 Union Court, Old Broad Street, E.C. Quantities by Mr. W. James Pamphilon, 21 Finsbury Pavement, E.C.:—

Kemp	£5,050	0
Hoare	4,983	0
Peacock Bros.	4,560	0
Candler & Son	4,294	10
Sharpe	4,250	10
Irwin	4,250	0
Staines & Son*	4,248	0

* Accepted.

LONDON, W.—For the erection of new chapel and mortuary at Manor Place, Paddington, W., for the Borough of Paddington. Mr. George Weston, surveyor. Quantities supplied:—

B. Nightingale	£4,188	0
Martin, Wells, & Co.	3,998	10
Richards & Co.	3,462	0
Spencer, Santo, & Co.	3,399	0
Foster Bros.*	3,397	0

* Accepted.

PEMBROKE.—For the erection of a new workhouse infirmary. Mr. E. H. Lingen Barker, architect, Hereford:—

T. & J. Brown, Llanelly	£4,124	5	0
Davies & Griffiths, Pembroke Dock	3,702	3	9
W. P. Lewis & Co., Hereford	3,645	0	0
Davies & Morgan, Pembroke	3,573	0	0
D. Davies, Cardiff	3,378	0	0
T. Watkins & Co., Swansea	3,378	0	0

RADCLIFFE-ON-TRENT.—For the construction of new sewerage and sewage-disposal works at Radcliffe-on-Trent, for the Bingham Rural District Council. Mr. W. H. Radford, C.E., engineer, Albion Chambers, King Street, Nottingham:—

J. F. Price, Nottingham	£10,214	0	0
W. Pattinson & Sons, Sleaford	9,052	0	0
T. Smart, Nottingham	8,966	5	6
G. Bell, Tottenham, London	8,789	0	0
Lock & Andrews, Nottingham	8,694	11	10
S. E. Lucas, East Leake	8,636	11	0
A. Jenkins, Southwell	8,550	0	0
S. Richmond, Nottingham	8,442	0	0
Grisenthwaite & Newton, Carlisle	8,354	0	0
T. J. Hawkins & Co., Ashford, Middlesex	8,098	9	8
J. Ford, Coalville	7,952	0	0
J. Holme, Leicester	7,870	15	0
C. E. Carden, Penkridge, Stafford	7,790	0	0
G. F. Tomlinson, Derby	7,775	0	0
H. H. Barry, Radcliffe on-Trent	7,770	0	0
Cope & Raynor, Nottingham	7,667	13	0
Johnson & Langley, Leicester	7,291	18	11
Bower Bros.,* West Bridgford, Nottingham	6,948	0	0

* Accepted.

SALTERTON.—Accepted alterations and additions at "The Baths," and converting into a Gentlemen's Club. Mr. Ernest E. Ellis, architect, Exmouth and Salterton:—

G. Bennett, Salterton.

SOUTHEND ON-SEA.—For the erection of 12 proposed small houses on the Avenue Estate, Southend. Mr. Frampton A. Knight, surveyor, 2 Wetherby Terrace, Earl's Court, London, S.W.:—

G. Saint, Kensington, W.	£4,800	0	0
Holdstock & Mould, Earl's Court, S.W.	4,600	0	0
J. W. Jones, Croydon	4,499	0	0
F. J. Trew, Westcliffe-on-Sea	4,350	11	2
J. H. Matthews & Son, Leigh-on-Sea	4,270	0	0
A. Ducat, Westcliffe-on-Sea	4,080	0	0
H. & S. Kerry, Leigh-on Sea	3,809	8	0
T. Lawford, Southend	3,750	0	0
Howard & Ruffell, Hockley	3,629	0	0
A. Woodiwiss, Southend	3,396	0	0

COMING EVENTS.

Wednesday, December 4.

RUSKIN SOCIETY OF BIRMINGHAM.—The Rev. Professor H. C. Beeching on "Ruskin as a Man of Letters," 7.45 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

SOCIETY OF ARTS.—Mr. Herbert Stone on "The Identification of Wood and its Application to Scientific and Commercial Purposes," 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Section).—Mr. John Ednie on "The Applied Art of To-day and Yesterday." 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

INSTITUTE OF CHEMISTRY.—Annal Dinner, Hôtel Metropole, at 7 p.m.

Thursday, December 5.

ROYAL ACADEMY.—Demonstration in Anatomy: The Head and Neck. By Prof. Arthur Thomson, M.A., 4 p.m.

SOCIETY OF ARTS (Indian Section).—Mr. Edward Penton, B.A., on "The New Trade Route to Persia by Nushki and Seistan," 4.30 p.m.

ROYAL SOCIETY.—Ordinary Meeting at 4.30 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. J. Bridges Lee, M.A., on "Geometric Interpretation of Photographs," 8 p.m.

Friday, December 6.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. Sydney Perks on "The Ethics of Dilapidations," 7.30 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. H. H. Statham, F.R.I.B.A., on "The Architectural Treatment of Bridges."

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. C. Ernest Monro on "Hotel Planning and Construction," 8 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' meeting).—Mr. R. W. A. Brewer on "Gas-Engine Construction," 8 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. F. S. Pilling, A.M.I.M.E., on "Street Railway Construction for Electric Traction," 8 p.m.

Saturday, December 7.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Annual Meeting at Carpenters' Hall, E.C., at 6 p.m.

BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—Winter Meeting at the Geological Society's Rooms, Burlington House, W. Election of Council and Officers and new members and associates. Mr. A. G. Cloake on "French Practice in the Manufacture of Cast-iron Pipes." Mr. S. H. Terry, M.I.C.E., on "English Practice in the Manufacture of Cast-iron Pipes." 10.30 a.m.

SANITARY INSPECTORS' ASSOCIATION.—Meeting at Carpenters' Hall, London Wall, E.C. Mr. W. Morley on "Drain Ventilation," 6 p.m.

Monday, December 9.

INSTITUTION OF ELECTRICAL ENGINEERS.—Annual Dinner, Hotel Cecil, 7.30 p.m.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

SOCIETY OF ENGINEERS.—Annual General Meeting at 7.30 p.m.

BRISTOL SOCIETY OF ARCHITECTS.—Mr. Harold Smith, A.R.I.B.A., on "Paris, Past and Present," 8 p.m.

LONDON INSTITUTION.—Mr. Francis Bond, Hon. A.R.I.B.A., on "Mediæval Monks and Monasteries," 5 p.m.

Tuesday, December 10.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—Paper by Mr. J. Coates Carter, F.R.I.B.A., at 8 p.m.

MANCHESTER SOCIETY OF ARCHITECTS (Students' Meeting).—Mr. Percy Darbyshire on "Furniture."

INSTITUTION OF CIVIL ENGINEERS.—Mr. Bryan Donkin, M.I.C.E., on "Motive-Power from Blast-Furnace Gases," 8 p.m.

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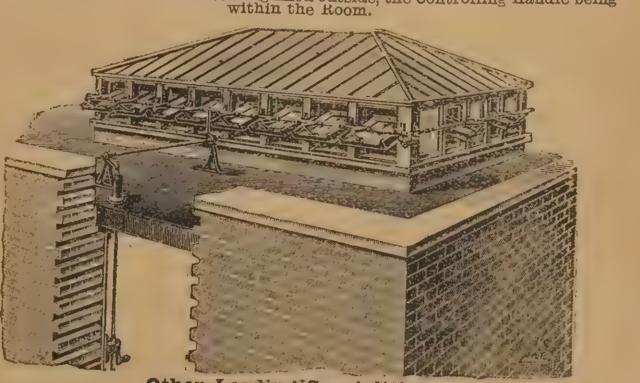

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Wednesday, December 11.

SOCIETY OF ARTS.—Prof. Ernest Wilson, M.I.E.E., on "Aluminium," 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. J. Miller Carr on "Terra Cotta, &c," 7.30 p m.

Surveying and Sanitary Notes.

Eighteen Papers on the Walls.—The medical officer of health for Poplar (Dr. Alexander) states that some of the rooms which have been stripped after small-pox had eighteen, fifteen, twelve and ten papers on the walls.

London Street-Widenings.—£58,100 has been given for the vacant land, 3,850ft. super., of the site of Nos. 82 to 85, Fleet Street, for the continuation of the widening there; and £7,560 for the leasehold interests in a house required for the widening of Fenchurch Street.

National Registration of Plumbers.—The District Council for Cardiff, South Wales, and Monmouthshire, in connection with the Worshipful Company of Plumbers, London, have arranged for the present winter a series of papers on subjects dealing with the plumbers' craft, to be given in the Technical Schools, Cardiff, to the registered plumbers and students in the Council's district. The first of these was given by the president of the council for the current year, Mr. W. H. Dashwood Caple, architect, on November 26th, Mr. E. J. Sawyer, R.P.C., in the chair.

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Registered to carry on the business of contractors for and manufacturers of wood-pavement, wood-block flooring, concrete and asphalting, manufacturers of paint, varnish and other similar articles, &c., and to undertake all classes of work connected with the building trade formerly carried on by R. L. Lowe at Farnworth, near Bolton, Lancashire. Capital £15,000 in £1 shares. The first directors are S. E. Lowe, L. Rushton and C. Cooper.

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Registered to acquire as a going concern the business and undertaking of James Puttrell, painter, &c., as now carried on at Sheffield Moor, Sheffield; and to carry on the business of painters, decorators, paper and paint merchants, glaziers, plumbers and builders. Capital £5,000 in £1 shares. Registered office: 94, Sheffield Moor, Sheffield, Yorkshire

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Registered to acquire the Netherton Colliery, in the county of Northumberland, now belonging to or worked by Charles R. Barrett and others, trading as the Netherton Coal Company, and to construct brickworks, limekilns, &c. Capital £100,000 in £100 shares. Registered office: 11, Queen Street, Newcastle-on-Tyne.

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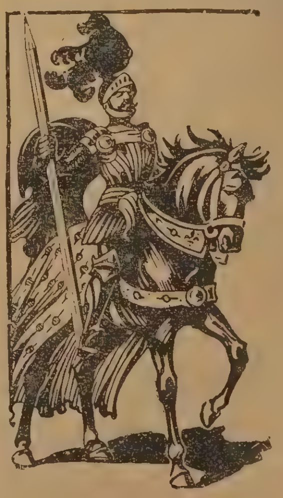

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A New Mission Room at Sutton-in-Ashfield for St. Modwen's Church has been erected on High Pavement. It is a brick structure, and will seat about 200 persons, and the cost will be about £300. The contractors were Messrs. A. Wass and A. Straw.

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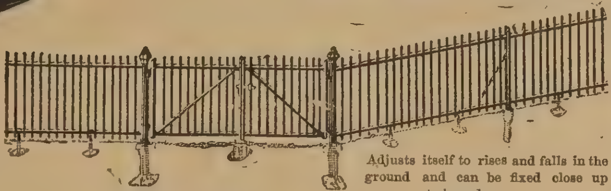

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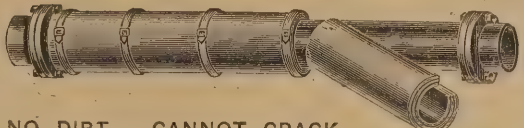

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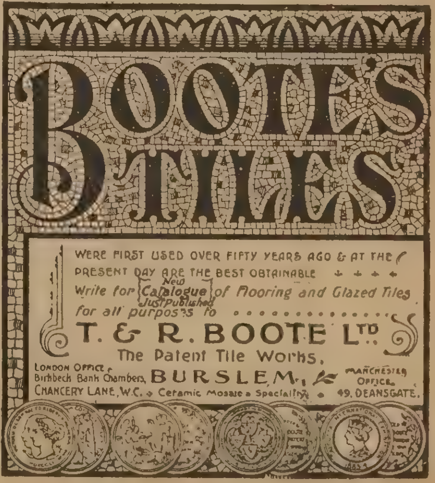

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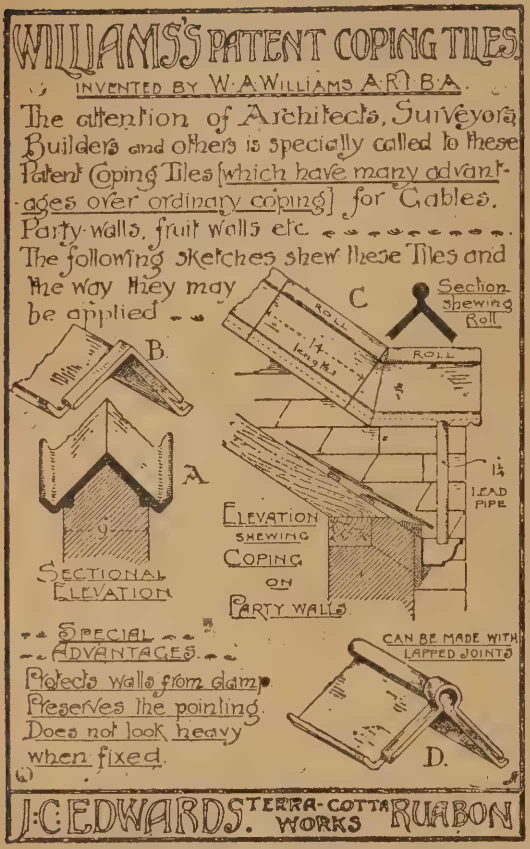

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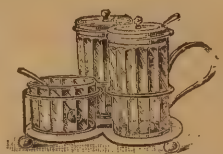

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DECEMBER.

VICTORIA MEMORIAL NUMBER.

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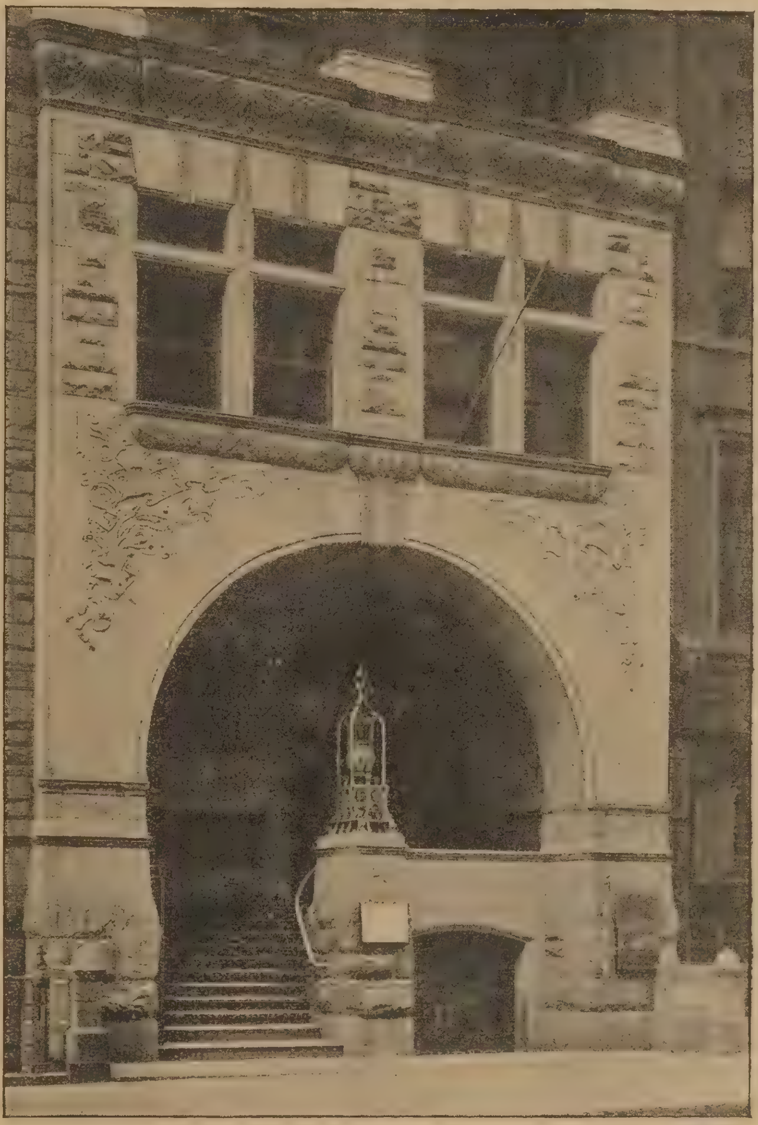
An Architectural Causerie.

A Weak Defence. THE smallest things sometimes furnish a clue to the greatest mysteries, and so it happens that when Mr. Akers-Douglas, First Commissioner of Works of His Majesty's Government, brings forward as proof of Mr. Henry Tanner's eminence as an architect the fact that he is a F.R.I.B.A. and won the Tite prize in 1878—we are inclined to think that the First Commissioner knows very little about the practice of architecture in this country to-day: and we feel rather sorry for Mr. Tanner himself, who, we are sure, would wish that something less ridiculous had been said about him. If it were not for Mr. Leonard Stokes, this controversy might be very one-sided, because so much depends on the exact state in which the drawings were left by Mr. Brydon, and as these have been in Mr. Akers-Douglas's possession for some time past we should not have been able to know the exact truth about them; for it is not probable that, without such bullying, the First Commissioner would have made the generous offer to exhibit the drawings in support of his action. However, Mr. Stokes, as one of the executors, happens to have had the drawings in his possession before they went to the Office of Works, and he has several times asserted that they were very incomplete, and, what details there were, hurriedly done. We do not accuse Mr. Akers-Douglas of dealing obstinately in this matter, for we feel sure he is desirous of securing the best results in the circumstances, but there are certainly two or three practising architects who are more capable of finishing Brydon's work than the Office of Works; and as to the question of an outside architect subordinating "his own inventive genius to that of the original designer," we never heard at the time when Mr. Brydon's design was first exhibited that it was such an immaculate work of art and that the creator of it was the apotheosis of architecture which Mr. Akers-Douglas apparently supposes he was: and if every little scratch he made when the Office of Works was hurrying him to get out the drawings for the contract is to be considered sacred, we certainly shall not have the building as Brydon himself would have built it. Rather, the incompleteness of these drawings demands that the hurried details shall be dealt with by a trustful hand, and we might name one architect especially who would be quite as sympathetic in his treatment as Mr. Henry Tanner. But we lose faith in the official sympathy, which Mr. Akers-Douglas is so confident he has secured, when we hear that, as a commencement, the sloping roofs of Brydon's design have been swept clean away and replaced by flat asphalted ones!

Mr. Holiday's New Reredos. IT is well known that owing to one circumstance or another—such as deficient lighting of the chancel, lack of convenient size in the panel spaces, or the blinding quality of the glass in the window over the altar—painting is generally ineffective as the principal part of a reredos. Indeed, an ordinary painting on panel or canvas in such a position is generally quite invisible 30ft. away. To remedy this defect many expedients have been adopted, such as gilding the ground, thus emphasizing the silhouette of the subject, making use of relief with the addition of colour, raising parts of the surface with gesso, &c.; and to most of these processes some objection, either æsthetic or practical, has been taken. The problem as to the absolute best still awaits solution, and yet another attempt has lately been made by Mr. Henry Holiday to solve it by combining enamel with relief, a material hitherto only used for small surfaces, at least in connection with serious art. Notwithstanding the richness and depth of colour obtainable by the use of enamel, the smooth and shining surface which it presents is quite unsuitable for large decorative work, and it is with the object of retaining the glow of colour while breaking up the surface that Mr. Holiday has made his experiments. He is now at work upon a reredos for the church of the Holy Trinity, Edinburgh, the centre panel of which is 7ft. high by about 2ft. 6in. wide, and the two side ones 5ft. by 2ft., which is an example of this fresh process. The central panel is finished, and some idea of the final effect may be gained from it, though the lighting of a studio is so different from that of a church that surprises are not unlikely. The subject is the "Crucifixion," and the side panels will be filled with "The Agony in the Garden" and "Christ bearing His Cross" respectively. The cross rears itself to the top of the panel against a dark blue sky in which the sun and moon are set, dull blood red; below, it is gashed with bars of light, against which the dark blue hills and the very successfully suggested town stand in solemn colour. The pale figure of the Christ is sustained by cords bound about his body in the manner suggested by J. J. Tissot in his drawings of the Passion. The figures of the Virgin, the Magdalene and St. John are in brighter colours—pale blues, crimsons, greens, purples and golden browns with some admixture of white. The design is modelled in low relief and the plates of silver or copper for each part (for the surface is cut up into many sections) are *repoussé* to fit the casting from the model; they are then coated with enamel colours and fired, some once, most of them twice, some even three times. The moulds are useful in the furnace to support the metal, which, being thin, would otherwise lose its shape in the great heat. The mixture of transparent and opaque enamels gives great opportunity for variety of effect, and beauty of colour is easily obtainable after a little practice. The several pieces are stuck down upon a shaped matrix with cement, the backs being made rough and coated thinly with enamel so as to ensure adhesion; but whether this will prove effectual time will show. Mr. Holiday has also in hand a wall panel for the chapel of Aysgarth School in Yorkshire. The subject is "The Carpenter's Shop," and the process used is the same. In this



ENTRANCE TO ALDRICH COURT, 45, BROADWAY, NEW YORK. CABLE AND YOUNG, ARCHITECTS.

GENERAL VIEW OF CAUDEBEC-EN-CAUX FROM THE LEFT BANK OF THE SEINE.

case it is proposed to add a frame in which a good deal of mosaic will be used, and it will be interesting to see how the materials will unite. The enamel colours are most of them made in the studio, or at least in a room opening from it, and Mr. Holiday has also been making pot metal for stained-glass windows, in which he has attained considerable success, as may be seen in a window now in his studio in which some very beautiful greens, blues and purples are introduced. The window is for a church in New York, and the figures of St. Paul, St. Stephen and Phebe are set beneath elaborate canopies of fourteenth-century style. The backgrounds are blue and ruby, counterchanged. This window is one of the most satisfactory which has come from Mr. Holiday's hand. A. W.

R.I.B.A.

THE following were elected members of the Royal Institute of British Architects at the last meeting:—

As Fellows—B. E. Baily (Nottingham), John Begg (Bombay), J. Cash (Oxford Street, W.), H. E. Farmer (Walsall), Henri Favarger (Cairo), J. H. W. Hickton (Walsall), F. E. Masey (Cape Town), M. B. Price (Pietermaritzburg).

As Associates—T. W. Aldwinckle (London, S.E.), H. Allberry (Dublin), J. P. Bishop (London, W.), C. H. E. Bridgen (London, W.C.), H. Cayley, M. A. (London, S.W.), F. D. Clapham (Eltham, Kent), W. B. Dawson (London, S.W.), H. D. Day (Godalming), W. M. Dean (London, W.C.), L. G. Detmar (Sutton, Surrey), T. N. Dinwiddy (Greenwich), L. W. Ensor (Sheffield), K. Gammell (London, W.C.), L. C. Gregory (London, W.C.), C. Ll. Hall (Blackburn), J. P. Hall (London, W.), S. J. Halse (Canterbury), G. R. C. Harding (Lincoln), A. Holstead (Alnwick), E. V. King (South Shields), A. G. R. Mackenzie (London, W.C.), E. G. Page (London, W.C.), A. Pickup (Blackpool), L. E. Pryke (Summers Town, S.W.), E. J. Pullar (London, S.W.), A. H. Roe (Forest Gate, E.), R. B. Rowell (Colchester), C. Stretton (Leicester), J. G. Walker (London, N.W.), R. C. Wrinch (Ipswich).

As Hon. Corresponding members—Señor don Enrique Mariá Repulles Y Vargas, President, Central Society of Spanish Architects (Madrid), Senor don M. Alberto de Palacio (Madrid).

On the motion of Mr. Lacy W. Ridge, F.R.I.B.A., the following resolution was passed:

> That the Royal Institute of British Architects desires to thank the Local Government Board for the issue of Model By-laws, IV. (Rural Districts). While doing so the Royal Institute would urge on the Board the desirability of preparing a Model to enable Rural District Councils to regulate party-walls as distinct from external walls, a matter for which the Urban Model By-laws, to which the Board refer them, are not available. The Institute grounds this on the belief that the existence of properly constructed party-walls has proved an efficient barrier to the spread of fire, and that it is undesirable that such protection should be withdrawn in places where it has already existed.

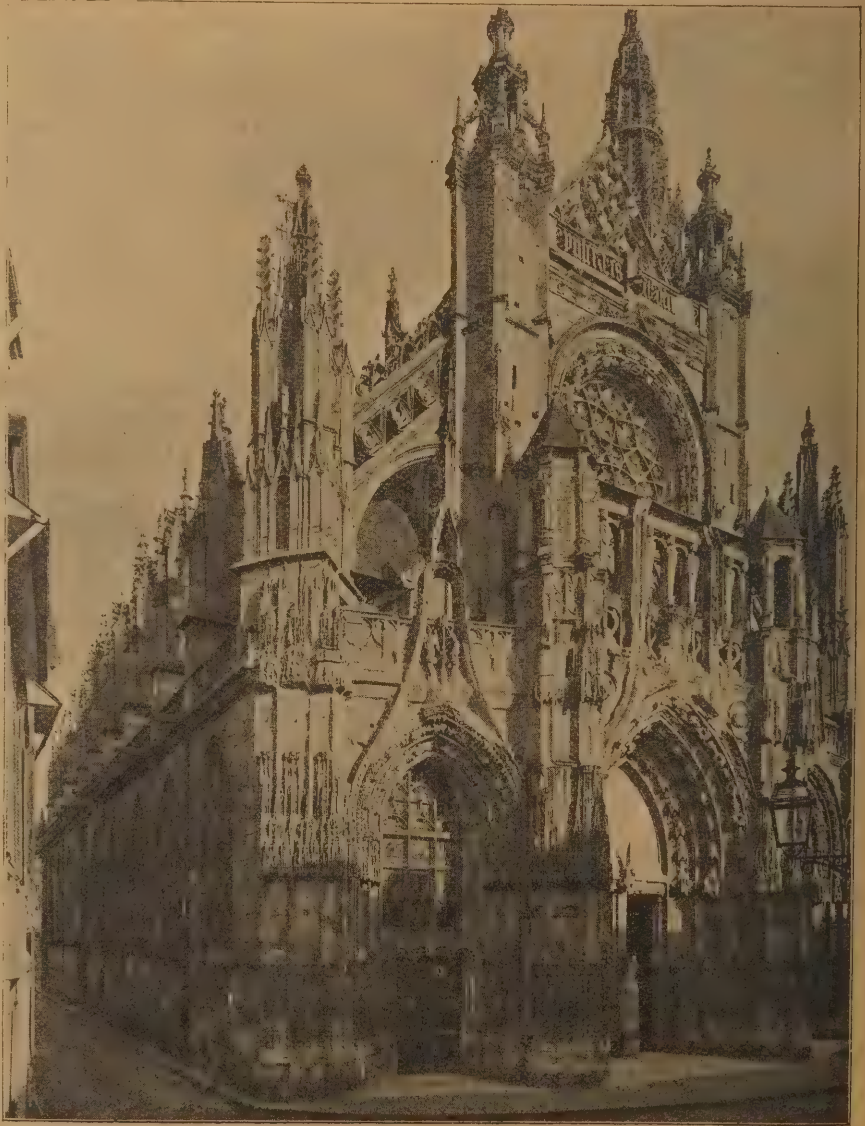
On the motion of Mr. H. D. Searles-Wood, F.R.I.B.A., the following resolution was also passed:

> That this Institute requests the Local Government Board to promote a Bill in Parliament to embody those sections of the London Building Act, 1894, which apply to ownership and the mode of dealing with party-walls, and make them apply to the United Kingdom.

CAUDEBEC.

By H. W. HOBBISS.

THE little town of Caudebec-en-Caux is situated in a beautifully-wooded country on the right bank of the Seine, about half-way between Havre and Rouen. The chief architectural interest is centred in its church, which is of the later Flamboyant period, with a western screen of the irresistible Francis I. date. This western elevation is remarkably beautiful in detail, and harmonises well with the earlier work of the nave and aisles. The accompanying illustration shows a characteristic French plan without transepts. As the south aisle is wider than the north aisle, it follows that either the west elevation has been "cooked" so as to bring the aisle doors equal, or there is a difference of 3ft. in their widths. I am inclined to think the plan is correct, as such a big difference would have been noticed at the time. The vaulting shafts to nave are corbelled out with figures immediately above the pier capitals. There are no capitals to the vaulting shafts. The nave effect is very similar to an English Decorated cathedral, with its beautifully-proportioned triforium and clearstory. One gets a somewhat



THE CHURCH OF CAUDEBEC-EN-CAUX.

discordant line in the triangular termination of nave, but this, however, produces a pleasing chevet arrangement. The church is full of interesting and most delicate carving; much of it was apparently restored during the Francis I. additions. The west end is occupied by the organ, which is corbelled out upon a gallery of Renaissance work. This, and the rose window above it, adds dignity and charm to the interior. Most of the aisle chapels contain piscinæ of the same period, and each is a gem of the mason's craft. There is a great deal of wrought-iron work used for screens, &c., and a dull brass lectern bearing the date 1716 is a work of art. The tower is 330ft. high, of open tracery, surmounted with a triple floral crown; but the effect is far from good architecturally, for it is of too jerky an outline. The town itself contains interesting work. There are many streets that have been unaltered (except by the hand of Time, and that has only beautified them) since the fifteenth century; and in their quaint romantic atmosphere one almost expects to see them suddenly peopled by Warwick's men-at-arms, for the town was taken by him and Talbot in 1419. The surrounding villages of Tumieges, Vatteville, Abbeyville, Norville, Boscherville, all contain work of interest and afford study for the architectural student; they are also within easy reach of Caudebec.

THE COST OF THE CRETAN EXPLORATIONS.

THE balance-sheet submitted by the Directors shows that since the Cretan Exploration Fund was established in the spring of 1900 about £3,500 have been raised by subscriptions, partly from learned societies, but mainly from individuals. Rather more than this sum has been spent on the excavations at Knossos, Kephale, the Dictæan Cave, Kato Zakro and Præsos. Knossos alone is accountable for £2,000, but unfortunately even this does not represent more than half the money spent on this important site. For, without reckoning his travelling or personal expenses, Mr. Evans has himself spent £2,000 on the work in the last two seasons. The large scale of the work, on which throughout the greater part of last season 200 workmen were constantly employed, makes it necessarily costly; and in this case, in addition to many other incidental items of expenditure, a great deal has to be done towards the conservation, and in some cases even the roofing-in, of the chambers discovered. To complete the excavation of the palace it is estimated that another £2,000 will be required, and, considering the unique importance of the discoveries made, it ought not to be difficult, even in these times, to raise so moderate a sum to complete so important a work. Mr. Hogarth has secured the right to excavate another very important early site which he would be prepared to undertake next season if a sum of at least £600 could be raised for the purpose. Unless this sum can be assured this very competent explorer must reluctantly abandon further work in Crete, which would involve a serious loss to archæological research.

Contributions to the Cretan Exploration Fund may be sent to the account of the Fund at Messrs. Robarts, Lubbock & Co., Lombard Street; or to the treasurer, Mr. George A. Macmillan, St. Martin's Street, W.C.

Mr. Shield's Pictures.—Last week, at the Dowdeswell Galleries in New Bond Street, a private view was given of seven paintings by Mr. Frederic Shields, intended to be placed in the Chapel of the Ascension, Hyde Park Place, W., of which Mr. Herbert P. Horne is the architect. Mr. Shield's paintings (which are not treated decoratively) comprise "The First Cleansing of the Temple," "The Lesson of Forgiveness," "The Leper Healed," "Faith," "Patience," "Hope" and "Love." In our opinion they fail in their most important particular—the colouring—and this is most noticeable in the robes of Christ, the fiery-rose tint of which stands out in unpleasant contrast to the rest. It is interesting to note that the pictures are painted on canvas which will be affixed with white lead to slate slabs riveted to the walls of the church, so as to leave an air-chamber behind, after the manner practised by Puvis de Chavannes at Amiens.

A SHORT HISTORY OF SEWAGE PURIFICATION.

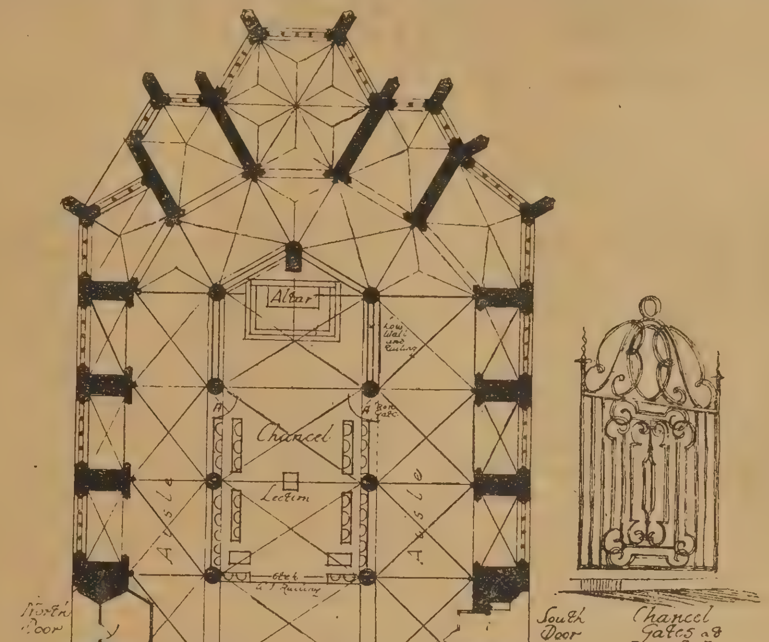
BY H. ALFRED ROECHLING, C.E., F.G.S.

AT a meeting of the Society of Engineers held on December 2nd a paper was read on "The Sewage Question during the last Century" by Mr. H. Alfred Roechling, C.E., F.G.S. After some preliminary remarks relating to his subject, the author gave a short history of the theory and practice of sewage purification during last century. Concerning its theory he remarked that from the position of pure instinct it had advanced through various stages until at last Pasteur and others had given it that form it now generally took—that in sewage purification, mechanical, chemical and biological agencies played an important part, and that the decomposition of the organic matter was in the main a bio-chemical process.

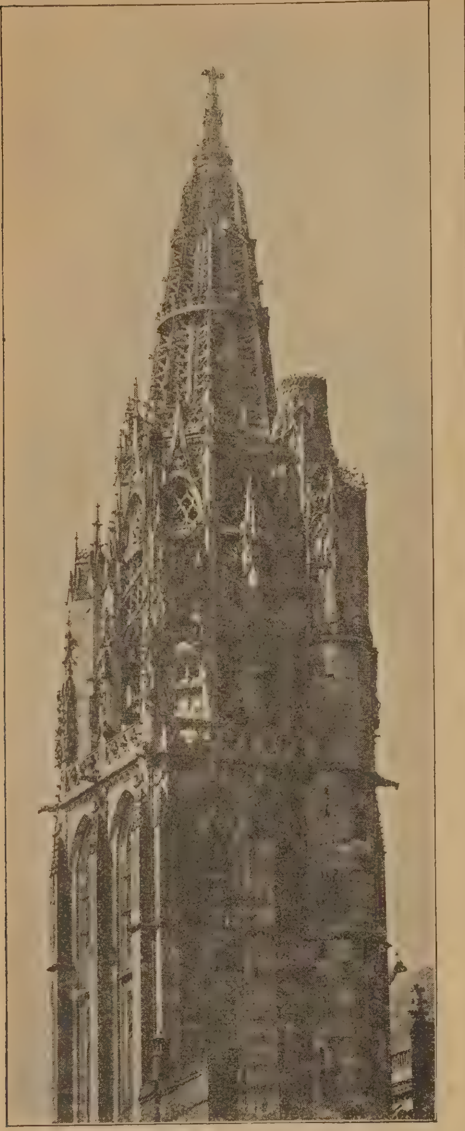
Dealing with the practice of sewage purification, the author observed that the only known method of sewage treatment at the dawn of the last century was irrigation on land. He then pointed out how, years afterwards, chemistry had tried to make a lucrative business out of it; how Commission after Commission, and in fact every authoritative enquiry, had expressed an unmistakable verdict in favour of land treatment, and how, in consequence of this mass of accumulated evidence, the Local Government Board had been compelled to insist on the land treatment of raw sewage or effluent in any scheme of sewage-disposal for which its sanction had been asked.

But the author observed that even the best of land could not do its work for ever if it was not well looked after. And so it happened that, through gross neglect and ignorance, the apparent failures created a strong feeling against land treatment, and finally led to the appointment of a new Royal Commission. This new Commission had just issued its interim report, in which it had re-established land in its position as the first and only natural method of sewage treatment, and had termed all the biological or bacterial methods "artificial," some of which would be admissible without land.

The author next referred to the natural self-purification of sewage, or to the self-purification of sewage in the only natural medium, land, and considered in detail the self-purifying powers of land, mentioning amongst other things that besides its retentive and absorbing properties it possessed also the power to decolorise, to deodorise and to retain and render harmless such poisons as strychnine, nicotine, &c. The self-purifying process, he said, might be likened to a



PLAN OF THE CHURCH OF CAUDEBEC-EN-CAUX. MEASURED BY H. W. HOBBISS AND G. DRYSDALE, AND DRAWN BY A. D. THACKER.



THE SPIRE, CAUDEBEC-EN-CAUX.

process of digestion; and when the digestive powers of land had been over-taxed, sickness was the only natural result.

After describing the work of bacteria in the soil and some products of their activity, the author stated that experience and experiment had proved that the chances of pathogenic germs doing further harm on sewage farms were exceedingly remote. No soil, with the exception of peat—owing to its great amount of moisture—was probably entirely useless, and a loamy sand subsoil had in many instances proved very effective. The depth of soil necessary for purification depended on local conditions, such as the character and thickness of the top soil (humus), the nature of its cultivation, the character of the subsoil (especially its facilities for retaining and exchanging air quickly), the surface slopes of the land, and the level of the subsoil water (thickness of the zone of evaporation, and of the passage and capillary zones).

Dealing next with the artificial self-purification of sewage, or the self-purification of sewage in artificial media, the author remarked that, apart from the sludge difficulty (which had been reduced but not altogether removed), these artificial methods had given very fair and encouraging results concerning the chemical purity of the effluent. But whilst warning his hearers not to expect that these theoretical results would be reached in practical working, and incidentally mentioning two cases of failure of works of this kind, he drew attention to the bacterial impurity of the effluent, which was little better in this respect than raw sewage. The Legislature, however, could not contemplate without the gravest concern the wholesale admission of pathogenic germs into the streams, as an action might lie againt a sanitary authority for causing an outbreak of typhoid fever lower down the stream.

After stating that the excessive quantities of manurial elements in the effluents from artificial self-purification works might engender such a luxuriant vegetation in the streams as to obstruct the natural flow of water and to completely cover the whole bed, the author stated that the objections raised led, in the natural order of things, to the supplementing of the artificial methods by the only natural one—land—when all reasonable requirements would be satisfied. It might likewise prove advantageous to partially treat the sewage by an artificial method before using it on the land. No system, however, would prove successful unless the present method of supervision of sewage-disposal plant was radically altered and the education of future managers systematically taken in hand.

NEW GOVERNMENT BUILDINGS.

MR. AKERS-DOUGLAS'S DEFENCE.

THE Right Hon. A. Akers-Douglas, M.P., First Commissioner of Works and Public Buildings, has taken occasion to publish in the "Times" a defence of his action in regard to the new Government offices in Whitehall and Parliament Street, more especially with respect to the completion of the new offices for the Local Government Board and Education Department designed by the late J. M. Brydon.

The R.I.B.A.'s Letter.

On November 8th last the following letter was sent from the Royal Institute of British Architects to Mr. Akers-Douglas:—

Sir,—The Council of the Royal Institute of British Architects have taken the opportunity of their first meeting of the session to pass a unanimous resolution that representations be respectfully addressed to His Majesty's Government with regard to the present proposal to execute the new Government buildings in Parliament Street from the late J. M. Brydon's designs without the aid of a specially-appointed architect of repute. The Council, with the warm support of the presidents of all the architectural societies in the United Kingdom in alliance with the Royal Institute, whose names are appended as signatories to this letter, venture to express the earnest hope that even at this eleventh hour an architect in sympathy with Mr. Brydon's artistic ideals may be appointed to superintend the erection of this vast building, which, if not very carefully detailed in the spirit in which it was designed, will lose much of the grace with which Mr. Brydon, had he lived, would have clothed it. They would also, with all deference, point out that it is only during the execution of his building that the architect himself arrives at the true development of his original conception, so that, for the successful execution of work of this important character, the inventive genius of a sympathetic colleague of the original designer is essential.

The Council of the Royal Institute of British Architects earnestly and respectfully urge the above considerations upon the attention of His Majesty's Government.

We have the honour to be, Sir, your most obedient servants,

WILLIAM EMERSON (President, Royal Institute of British Architects).
THOMAS DREW, Kt. (President, Royal Hibernian Academy, Member of Council R.I.B.A.).
GEORGE C. ASHLIN (President, Royal Institute of the Architects of Ireland).
F. MARSHALL (President, Sheffield Society of Architects and Surveyors).
S. PERKINS PICK (President, Leicester and Leicestershire Society of Architects).
ALFRED DARBYSHIRE (President, Manchester Society of Architects).
JOHN JAMES BURNET (President, Glasgow Institute of Architects).
FRANK CAWS (President, Northern Architectural Association).
FRANK W. WILLS (President, Bristol Society of Architects.)
ARTHUR MARSHALL (President, Nottingham Architectural Society.
F. M. SIMPSON (President, Liverpool Architectural Society).
W. H. BIDLAKE (President, Birmingham Architectural Association).
BUTLER WILSON (President, Leeds and Yorkshire Architectural Society).
H. G. LUFF (President, Devon and Exeter Architectural Society).
JAMES P. BRUCE (President, Dundee Institute of Architecture, Science and Art).
C. H. CHANNON (President, York Architecture Society).
EDWIN CORBETT (President, Cardiff, South Wales and Monmouthshire Architects' Society).
ARTHUR CLYNE (President, Aberdeen Society of Architects).

Lord Esher's Reply.

In reply to this letter Lord Esher wrote to the Secretary of the Royal Institute of British Architects as follows:—

Sir,—I am directed by the First Commissioner of His Majesty's Works, &c., to acknowledge the receipt of your letter of the 8th inst., together with a resolution signed by the President of the Royal Institute of British Architects and others; and to say that Mr. Akers-Douglas quite appreciates the point of view of those who would prefer some other method of carrying out Mr. Brydon's work than that upon which he has decided. It was, however, after careful examination, during which none of the considerations now urged were overlooked, that the decision to carry out the designs by the agency of Mr. Henry Tanner, F.R.I.B.A., the principal architect of this Department, was arrived at. I may say frankly that among architects of high repute the First Commissioner failed, after some confidential enquiry, to discover any one sufficiently in sympathy with Mr. Brydon's artistic ideals to subordinate his own inventive genius to that of the original designer. It appeared to Mr. Akers-Douglas due to the memory of Mr. Brydon that his work should remain intact, and that the designs which he left should be carried out with as little variation as possible. The question as to whether these drawings are in a sufficiently complete state to enable this to be done is one upon which the First Commissioner is aware opinions differ; but he has confidence in the judgment of his technical advisers, and he will be ready to exhibit these drawings to Parliament should his action, as a Minister of the Crown, be hereafter questioned.—ESHER.

On November 27th Sir John Aird, M.P., wrote a letter to Mr. Akers-Douglas in which he expressed the desire "to be able authoritatively to say that there is no ground for the great uneasiness which would appear to be felt in some quarters in reference to this important subject."

Mr. Akers-Douglas to Sir John Aird.

Mr. Akers-Douglas, in his reply, after detailing the measures originally adopted by the Government for the selection of the architects for the new public offices, said:—

THE LECTERN.
CAUDEBEC CHURCH.

Mr. Brydon left no son or partner to succeed him. It seemed to the Government to be out of the question to abandon his plans after the large sum already expended on them and on the foundation works; and if his designs, which are still satisfactory to the Government, are to be carried out they should be executed in their integrity. I satisfied myself, after careful enquiry, that this object would be best secured by entrusting the execution of the plans to the architects of my own Department. Fortunately, very abundant materials existed for ascertaining Mr. Brydon's intentions. His executors handed over to the Office of Works complete plans, elevations and sections, to the scale of 10ft. to an inch; also full, careful and clearly drawn ½in. scale details of all the important parts. The work of carrying out these designs was placed in the hands of Mr. Henry Tanner, principal architect to the Department, who is a Fellow of the Royal Institute of British Architects, and the winner of their Tite prize for classical design in 1878. Thus qualified, Mr. Tanner may fairly claim to have been recognized by that body as possessing talent for sympathetic treatment of the work. The employment of Mr. Tanner has the great advantage of securing that the building shall be erected with every regard to the requirements of the Departments which will occupy it; and for this end not only Mr. Tanner's own great experience in the erection of very large public buildings, but that of Sir John Taylor (who will be in consultation with him), will be available. Such saving of cost as there may be by this arrangement has only weighed with me as a secondary consideration.

It is obviously unfair to speak of this work, as many do, as if it had been handed over to draughtsmen or architectural clerks, or as if the attention of the Office of Works staff would be given to it in the intervals of ordinary official duties. On the contrary, I have made arrangements in the Department to relieve Mr. Tanner of much of his ordinary business; and Mr. Brydon's chief assistant, who prepared a large proportion of these drawings under Mr. Brydon's direction, has been engaged to assist in working out such details as yet have to be made up. I have confidence in the judgment I have formed upon the advice of my professional staff that this development of the drawings can be faithfully and effectually executed. I shall be prepared to exhibit Mr. Brydon's designs, stamped and signed as being those handed over by his executors, for the information of Parliament, and to defend my action if it should be questioned.

As a further guarantee that Mr. Brydon's work shall be respected, I propose that no variations in the external elevations shall be made without the assent of the advisory committee above mentioned, on which Mr. W. Emerson (president of the Royal Institute of British Architects), Mr. Aston Webb and Sir John Taylor will act; and, in the improbable event of any suggestions for such variations being put forward, I will refer them to this Committee. I venture to think that when my action is fairly considered in the light of the full facts it will be held to have been justified.

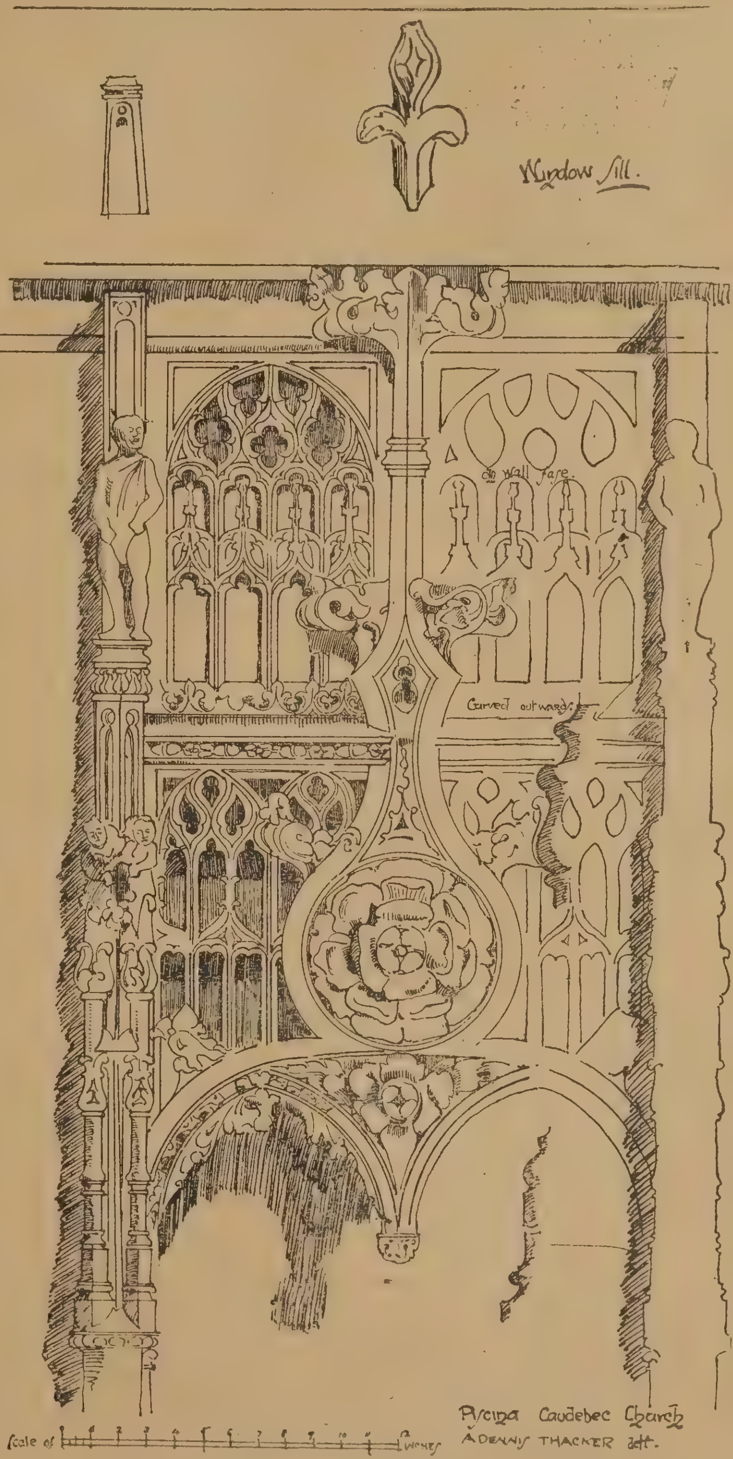
Mr. Leonard Stokes.

With regard to the foregoing correspondence, Mr. Leonard Stokes says:—

We are told "frankly" that the First Commissioner of Works failed, after confidential enquiry, to discover an architect of high repute who would subordinate his own inventive genius to that of the original designer. He therefore thought fit to entrust the work to Mr. Henry Tanner, F.R.I.B.A., chief architect to the Office of Works. Would it be troubling Mr. Akers-Douglas too much to ask for a hint as to the direction in which these "confidential enquiries" were made? I know more than one architect of repute, and I cannot help thinking that at least one of them would have entertained the idea had it been put to him nicely. It would be interesting to know the views of the advisory committee Mr. Akers-Douglas tells us of on the whole question—*i.e.*, if they have been consulted. I happen to have private information on this head, but, of course, I cannot use it here.

May I further trouble Mr. Akers-Douglas with the information that he can never hope to "retain his (Brydon's) work intact," as the drawings which I handed over to him—and for which he paid only two-fifths of the whole fees due—are nothing like complete enough to ensure this? Some other individuality must creep into the building. We had hoped that this might have been the individuality of an outside architect of repute, but fate appears to have decreed otherwise.

It is absurd, under a mistaken sense of loyalty to Brydon's memory, to blindly carry out this great work from details hurriedly made by him, for he would have been the first, as the work proceeded, to thoroughly amend these drawings himself, but the last, I fancy, to ask the Office of Works to do so for him. It is equally absurd to maintain, as Mr. Akers-Douglas suggests, that any gentleman who happens to be a F.R.I.B.A.—their name is legion—and who may have won the "Tite prize" (a small students' affair) in his youth, is therefore to be recognized as suitable to complete the greatest building of the age.


Window Sill.
Wall face.
Carved outwards
Scale of 0 1 2 3 4 5 6 7 8 9 10 11 12 inches

Piscina Caudebec Church
A Dennis Thacker delt.

It is admitted that Mr. Tanner is a very able man, but it is news to some of us that his ability lies in the particular direction now stated. If it does, the wonder is that this has not been discovered sooner, and we shall, I hope, hear more of him in times to come, as there is a great field open before him at the Office of Works.

P.S.—*I have just heard on credible authority that the Office of Works has made a clean sweep of the whole of the sloping roofs as designed by Brydon and substituted flat asphalt ones instead. How does this tally with their recently-published pledges?*

Painswick Parish Church has recently had several additions. The framework of the bell had for some time been in a dilapidated state, and a few months ago steps were taken to rehang the bells in an iron framework. With the old woodwork a lych-gate has been erected at the end of Stroud Road. In addition to these improvements, a screen has been erected at the west end of the church at a cost of £700 by Messrs. Boulton & Son, of Cheltenham, from designs by Messrs. Protheroe & Phillott.

BRICKLAYING AND TRADE-UNIONISM.

A LITTLE RETROSPECT.

MR. SIDNEY WEBB and his wife, Mrs. Beatrice Webb, contend that the absence of any contradiction in the columns of the "Times" is no proof of the correctness of the assertions made in that paper with respect to the decadence among the building trades caused by trade-unionism. "Working men do not read the 'Times,' any more than your correspondent reads our 'Industrial Democracy,' in which he would have found all his charges against trade-unionism examined in full and minute detail, and, we hope, with candour, four years ago. This elaborate work has not been refuted or replied to." They then go on to state in their letter to the "Times" that the complaints as to diminished quantity or energy of work, and of the tacit conspiracy to discourage individual exertion, occur with curiously exact iteration in every decade of the last hundred years at least. "Even in the sixteenth century there were found those who, in the words of Orlando in 'As You Like It,' sighed for—

> The constant service of the antique world"
> When service sweat for duty, not for meed.

But such complaints are evidence only of the psychological condition of their utterers—they prove no objective fact. To give one instance only, we have found exactly the same accusation of the bricklayers limiting the number of bricks, and precisely the same belief that they were only doing 'half as much' as they did twenty years before, in the great strikes of 1833, in those of 1853, again in 1859-60, and again in 1871. We believe them all—that is to say, we take them as some evidence that the employers felt the workmen's constant attempt in all ages to alter the bargain to their own presumed advantage. But we have found absolutely nothing that can be called evidence that the actual *quantum* of work done per hour, quality and conditions being taken into account, is less to-day than it was a hundred years ago. (It must be remembered that brickwork differs enormously, and that some that passed muster in old days would not now be allowed by the architect or district surveyor.) We must add that we entirely disbelieve in the existence of any unwritten limit of 400, or any other number, of bricks per day as a consciously agreed-upon limit. This is another old story, for which, after much investigation, we have never been able to find any evidence."

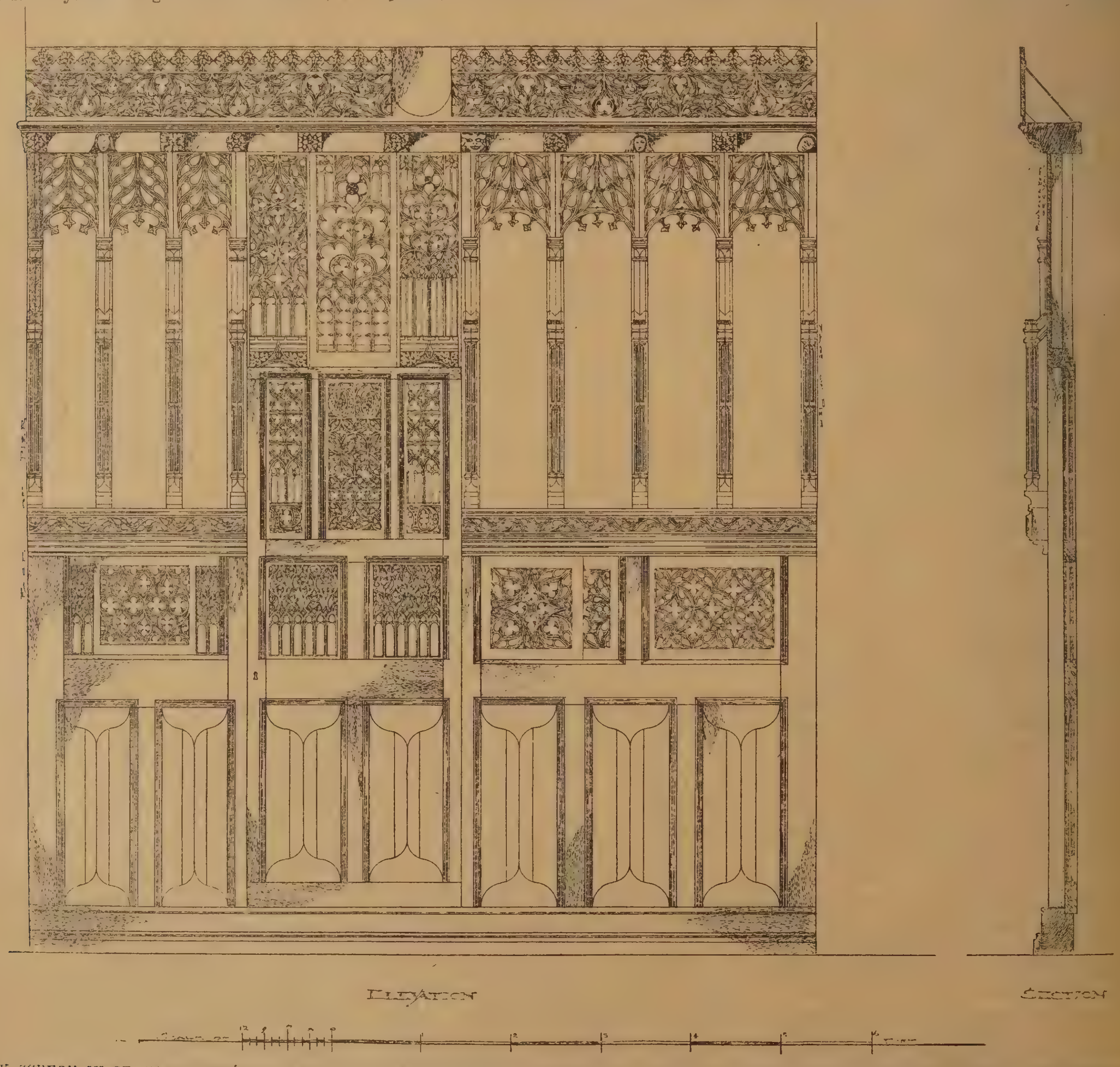
Mr. Webb and his wife occupy the rest of their letter with a lengthy discussion of the merits and demerits of trade-unionism, which we have not the space to print. They state that, though they hold no brief for trade-unionism, they believe, after considerable investigation, that the statements made in the "Times" are "quite incorrect and the reverse of the truth."

Earl Grey's Views.

Speaking at Bolsover on Saturday last, Earl Grey referred to the effect of trade-unionism on British industry, and said that what was wanted was education, conferences between the representatives of employer and employed, and a full knowledge of the cost of production both in this and other countries. The standard of wage which aimed at not a minimum but a maximum, beyond which a workmen should not be allowed to go, killed excellence and produced dishonesty. The building trade furnished the greatest illustration of the evils which result from restriction of output. In this business there was no international competition. The builders of New York could not compete with the builders of Bolsover, and the builders of Bolsover could not compete with the builders of London. The restriction of output increased the cost of building, raised the rents, caused overcrowding, produced debility, which in its turn drove people to drink. What was wanted was the application of co-partnership principles and the imitation of the example set by Mr. Bainbridge, who had endeavoured to secure for his workmen the advantages of the towns and the fresh air of the country.

A Bricklayer Explains Why Fewer Bricks are Laid.

Mr. J. D. Maitland says in a letter to the "Times":—An average brick and its bed weigh 7lb., 1,000 equal 3½ tons, and it is impossible to properly lay this number in an ordinary day. The reason why fewer bricks are laid per day are: (*a*) A nine-hours' day, as against the 10½ of old. (*b*) The disappearance of the jerry-built front, with its sham masonry, stucco veneer and backing of



OAK SCREEN IN ST. CATHERINE'S CHAPEL, CARLISLE CATHEDRAL (DATE ABOUT 1480). MEASURED AND DRAWN BY DANIEL B. PATTERSON.

shoddy bricks. This is now replaced by sound honest work, well and truly laid. Some class of facings, notably stocks, on good work frequently cost twice as much to select as to lay, owing to the inferior nature of the bulk sent in by the contractor. (*c*) The generation which did such marvellous things were, for the major part, coarse, ignorant, beer-loving men, exploited by their shrewder compatriots, rightly called taskmasters, who, taking work by the piece, succeeded by the aid of a little beer and a copious supply of adjectives in inducing the workmen to slave like the fools they were.

New Patents.

These patents are open to opposition until January 13th, 1902.

1900.—Fastening Door-Knobs.—20,495. H. C. PRUCE, of the firm of A. Brown & Co., Smallbrook Street, Birmingham. Holes are drilled through the spindle at intervals, and the neck of the door-knob has a hole in it which is straight to the middle clearance and then diverges at each side. Thus, when a split pin is driven in, it spreads and so secures the knob to its spindle.

Conveyors.—21,238. W. H. ASTON, 46, Eagle Wharf Road, London, N. This conveyor is intended for transferring goods from one level to another—for example, from a railway truck to a shed. It consists of a girder frame carrying a drum at each end, over which passes an endless band. This frame is pivoted at one end to a suitable carriage having a motor (preferably electric) for driving the band attached to it. By these means goods are transferred continuously from one end of the frame to the other, thus facilitating discharge.

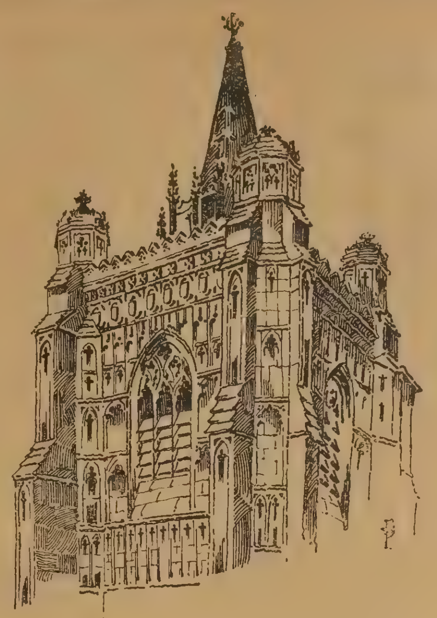
1901.—Preventing Steamy Windows.—1,526. B. WOLFENDEN, 809, Attercliffe Road, Sheffield. At the bottom of the window, in the centre, a gas burner is fixed. Over this fits a perforated metal chamber or hood having arms stretching across the window and perforated on the glass side. The hot air which is thus distributed over the window surface prevents steam condensing on the glass.

The following specifications were published on Saturday last, and are open to opposition until January 20th, 1902. *The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.*

1900.—20,239, KEITH, apparatus for heating and ventilating. 20,320, PFEIL, tenon joint. 20,667, BRAILSFORD, straightening and tempering saws. 20,917, HOGGART & ARNOTT, sliding catches, bolts or detents. 22,645, HUMFREY, gas stoves. 22,838, JENKINS, folding trestles. 23,362, HARVEY, hinges. 23,446, HOLDEN, iron-pipe wall-fastenings.

1901.—379, PARKES, locks. 511, SCHICKE, door-locks. 906, SEFTON-JONES (*Fader*), automatic gas-lighting apparatus. 2,482, COOKE, overflow and waste-water pipes and valves for lavatory basins. 3,917, WILLS, water-closets. 4,257, OGDEN, securing rainwater pipes. 18,368, HOYER, locks and fastenings for doors. 18,419, RÜCKGAUER, device for lifting and removing heavy weights, buildings, &c. 18,480, GUMPEL, circular saws. 18,580, DÜR, adjustable supports for scaffolding, staging, &c. 19,994, GIBSON (*W. S. Tyler Co.*), elevator gates. 20,297, LESLIE, door-knobs and spindles. 20,380, MONSHAUSEN, roofs of metal plates or tiles. 20,746, PLATT, traps for drains.

The Oak Screen to St. Catherine's Chapel, Carlisle Cathedral (of which a measured drawing by Mr. Daniel B. Patterson is given on the opposite page), is situated in the western transept, and probably dates from about the middle of the fifteenth century. Portions of it have been destroyed, such as the pinnacles which once surmounted the buttresses; also, some of the panels have been partly replaced by others of a different design.



TOWER OF ST. PETER MANCROFT, NORWICH.
G. E. STREET, ARCHITECT.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Construction should be the origin of decoration and ornament; but in its turn should be subservient to them, as in the flying-buttresses of our Gothic edifices.—PROFESSOR DONALDSON.

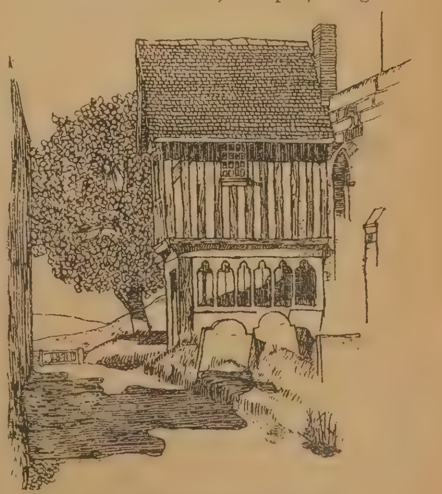
Our Plates. THE police entrance to the Central Police Station at Hull will be erected on the site of the present police station. Plans and a description of the new building were given in our issue for September 11th last.—The mission room attached to and adjoining Camden Church (famed for its chancel designed conjointly by the late Sir George Gilbert Scott and Mr. Ruskin) is one of many such buildings either completed or to be erected in South London under a scheme instituted by the Bishop of Rochester, who has personally interested himself in the work, and opened it in the spring of last year. The vicar, the Rev. Philip S. O'Brien, D.D., and Committee, placed the work in the hands of Mr. A. H. Ryan-Tenison, A.R.I.B.A., of 12, Little College Street, Westminster, who has executed considerable work in the parish. The design comprises a large hall and choir assembly-room, classrooms, retiring rooms and a caretaker's house. The hall alone is erected, but it is hoped at no far distant date to complete the whole scheme. It might be pointed out that the architect has met with considerable difficulty with reference to the levels on account of the instructions that the building must be placed within a few feet of the church and yet not impede the lighting to this latter, and that he has coped most successfully with both points. The contractor was Mr. H. H. Hollingsworth, of High Street, Peckham; and the furnishing was carried out from special designs of the architect by the Educational Supply Association, Limited. The cost to the present has been a little under £2,000.

St. Peter Mancroft. THE church of St. Peter Mancroft was restored in 1881 by the late Mr. G. E. Street at a cost of £14,000, the tower being completely restored at a cost of several thousand pounds and surmounted by a leaden flèche 40ft. in height, making a total height from the ground of 150ft. This tower is said to contain the finest peal of twelve bells in the kingdom. The church is cruciform in plan and of fifteenth-century date. The church was built in the Magna Crofta, or "great field" belonging to the castle, and became known as St. Peter in the Magna Crofta, and in course of time, by contraction of names, as St. Peter Mancroft. It is a fine specimen of Perpendicular architecture. The drawing is by Mr. Frederick G. Pain.

To Improve Manchester. MR. EDWARD SALOMONS has a scheme for improving Manchester. Instead of purchasing the Infirmary as a site for the new Art Gallery and home for the Reference Library, he would place these buildings in a square to be created by the acquisition of the whole of the land in Oxford Street, bounded by the M. S.J. and A. Railway, Great Marlborough Street, Sackville Street and Pritchard Street. This would give an open space of 58,000yds., or about twelve acres. Of this, 27,700yds. would have to be purchased, the streets accounting for the rest of the area. The extreme value of this land he puts at from £6 to £7 a yard, at which figure the cost would be about £194,000, as against a minimum, say, of £500,000 for the Infirmary. There would be ample space for an Art Gallery and Library, and a new open space formed only half a mile from the Town Hall. This district, he thinks, would in a few years become the fashionable centre of Manchester. A municipal theatre might also with advantage be erected on the site, and run with profit to the ratepayers. Mr. Salomons further suggests that if such an open space were made Oxford Street should be widened to, say, 120ft. right up to Whitworth Park, and this, he says, would at once decide what would be in the future the fashionable and literary, educational and art centre of Manchester.

Berkswell Church Porch. THIS church is dedicated to St. John the Baptist, and is a very interesting building. The chancel is a very good specimen of Norman architecture, one of the principal points of interest being the Norman crypt, which lies under the chancel and east end of the nave, the portion under the latter being octagonal and supposed to be of Saxon origin. The half-timber porch is not very often found in old churches. This one is of seventeenth-century date, and has a room over it which is used as a committee-room; it is reached by an outside staircase, and the woodwork has good details and carvings. The nave of the church has three different levels, and the aisles on the west and south have some finely carved and cut oak screens, one or two of the arches being Norman. The nave also has some Early English and Decorated portions. The clearstory and tower are seventeenth-century work. The drawing on this page is by Mr. E. Stanley Mitton.

Bewcastle Church Restored. BEWCASTLE CHURCH was practically rebuilt in 1792 and irredeemably spoilt. Six yards and a half were cut off the west end of the nave, and a curiously ugly tower erected. Inside galleries were inserted across the west end, and right up the north side to the chancel. To make room for this the walls had to be raised some 4ft., altering the old high-pitched roof into an ugly 45-deg. pitch. The old Early English windows thereupon appeared too short, so to make matters worse their shapely lancet heads were cut off and lintelled over square, and the upper part of the south wall was pierced with a second tier of square-sashed windows. Fortunately the east end and ancient buttresses (which are said to bear date 1066) escaped, though the



PORCH, BERKSWELL CHURCH.

two side-lights of the east window were walled up, so there are still to be seen the credence table in the north wall and the piscina in the south wall, and the two windows mentioned were reopened out some time ago. Since this "restoration" in 1792 no material alterations have taken place until now. The timbers had all become rotten, and the plaster peeled off, while the heavy roof was in danger of falling in, so that the present work of restoration became needful. Assistance has been given in the matter by Mr. W. G. Collingwood (the late Mr. Ruskin's secretary), and through his interest Mr. J. F. Curwen, architect, of Kendal, undertook the restoration. The result of the effort to give back to the church the character it possessed before 1792 has been successful. The piece cut off the nave could not be replaced, but the windows have had their lancet heads restored to them, the gallery running west to east has been removed and the walls lowered, the roof has again its original pitch, and the whole building has been re-lined and re-seated at a cost of about £620.

The Late Mr. C. J. Innocent.

WE regret to announce the death of Mr. Charles John Innocent, architect, of Sheffield, which occurred last Saturday week, at his residence, Wellesley Road, Sheffield, at the age of sixty-two years. Mr. Innocent was a Sheffield man, his father being Mr. John Innocent, a publisher well known in his day. His school-days over at the Sheffield Commercial Academy, he was articled to the firm of Weightman, Hadfield & Goldie, architects. In the year 1862 he commenced practice on his own account. The adoption of the Education Act of 1870, and the immediate demand for school buildings of an up to-date kind, proved a good thing for more than one architect. Mr. Innocent was fortunate enough to be appointed architect to the Sheffield School Board in 1871. School after school went up in quick succession from plans of his preparing, and about twenty of the older schools were designed by him. He also invented various school appliances, and included in his published writings is one on "Public Elementary Schools." Mr. Innocent was elected a Fellow of the Royal Institute of British Architects in 1889, and had served on the Council. He was also a Fellow of the Provincial Committee of the Surveyors' Institute. He acted as honorary secretary of the Sheffield Society of Architects and Surveyors for some years, and had also been president. In his professional capacity he had a considerable amount of work for the Sheffield Board of Guardians, providing the plans for and superintending the erection of the headquarters of the Children's Homes and the Cottage Homes for selected aged people. He acted as architect for Montgomery Hall, Glossop Road Baptist Church, St. John's Chapel, Crookesmoor, and many other well-known buildings in Sheffield and district. He recently took his elder son, Mr. C. F. Innocent, into partnership.

Street-Decoration.

NEXT June at the Coronation the City of Westminster will have an opportunity of distinguishing itself in the matter of street adornment, and already there is talk of starting the preparations. The General Purposes Committee of the Westminster City Council, it is stated, will take some part in deciding on the method of decoration, and it will doubtless have many plans submitted. Among them will be one suggested by Mr. F. Vigers, which provides an harmonious scheme of decoration for the whole of the route to be followed by the Coronation procession. He proposes that the roadways between Buckingham Palace and Westminster Abbey should be lined with Venetian masts, of original design, decorated with garlands of leaves and flowers, and also with celluloid spheres for illumination at night. In the immediate vicinity of the Abbey the masts would be replaced by white columns decorated with the royal arms, the garter and the crown, and surmounted with winged figures capable of being illuminated from below. At intervals along the route there would be triumphal arches of varied design. The first would represent Great Britain and Ireland, the second the Indian Empire, the third Canada, the fourth British Africa, and the fifth Australasia. Perhaps the most effective of all would be the Indian arch. This would consist of two white towers surmounted with gilded and coloured domes which could be electrically illuminated after dark. Between the towers would hang a large canopy of yellow silk topped with the Imperial crown. There is also a design for a royal canopy for use outside the Abbey. The scheme of decoration adopted should be both harmonious and in good taste. The local authorities charged with the consideration of the matter will, therefore, no doubt meet the public wishes if, without in the first instance committing themselves to any particular design, they adopt the principle laid down in the following passage from a letter from Mr. H. H. Armstead, R.A., to Mr. Vigers: "It would be much better to have the decorations designed and produced by an artist like yourself, who would make a labour of love of the work, than by an ordinary firm of contractors."

Princes Street, Edinburgh.—The photograph on this page (by Mr. F. J. Pape) shows on the left the new railway hotel at Waverley Station, a most unhappy building. It hides the view of Carlton Hill from many points and spoils it from all; it is of a white stone which does not harmonize with the blue-grey local stone of the rest of the city, appearing glaring in comparison.

PRINCES STREET, EDINBURGH.

Builders' Notes.

The Scarborough Master-Builders' Association held its annual meeting recently, Mr. A. W. Sinclair (president) occupying the chair. The annual report and balance-sheet, presented by Mr. R. H. Carr, were considered very satisfactory and were adopted. The officers for the ensuing year were re-elected as follows:—President, Mr. A. W. Sinclair; vice-president, Mr. T. B. Jowsey; auditors, Mr. W. Malton and Mr. W. Tindall; secretary, Mr. R. H. Carr.

The Master House Carpenters' and Joiners' Association held its annual meeting at Aberdeen recently, Mr. J. A Smith, president, in the chair. The death of Mr. Samuel Milne (of Messrs. M'Robbie & Milne, builders) was referred to. The following are the office-bearers of the Association for the ensuing year:—President, Mr. J. A. Smith (D. Macandrew & Co.); vice-president, Mr. Alexander Hall, Mile End; secretary, Mr. Henry Peterkin; treasurer, Mr. James Robertson, Princes Street; convener of Contracts Committee, Mr. William Dawson, Huntly Street; convener of Trades Committee, Mr. James Leslie (Leslie & Hay).

London County Council.—At last week's meeting of the Council the report of the Highways Committee, dealing with the tramway accounts for the year ending March 31st last, came up for consideration. It showed that from the southern system worked by the Council there had been a profit of £14,325 14s. 10d., and from the northern system (leased to the North Metropolitan Tramways Co.) a profit of £40,151 17s. It was recommended that a further £29,000 be transferred to the Special County Account, making £89,000 transferred in relief of rates for the year under review. After discussion this was agreed to.

The National Association of Slate Merchants and Slaters held its ninth annual conference at Scarborough recently. The president, Mr. Jonathan Davies (Portmadoc), in his address, said the Association had in several directions taken a practical step forward. The quarries were favourable to the Association, and an arrangement between the Welsh quarries and the Association was not only feasible but probable at no distant date. He considered that if roof-slating was to hold its own in the future it must be well done and be more artistic than in the past. Mr. Davies was re-elected president and the other officers were elected:—Vice-presidents, Messrs. William Follit (London), J. B. Johnson (Liverpool), R. Mascall (Middlesbrough), D. Nelson (Sunderland), J. E. Nelson (Sunderland), R. B. Starkey (Leicester); hon. solicitor, Mr. F. W Spink (Hull); hon. treasurer, Mr. Joseph Hunter (Hull); hon. general secretary, Mr. James Townsley (Hull).

Fire Tests with Doors.—A series of investigations were conducted by the British Fire-Prevention Committee on Wednesday last at their Bayswater testing station. Mr. Edwin O. Sachs, chairman of the Executive, presided; and among the principal visitors were Sir Joseph Renals, Bart. (late Lord Mayor), Sir James Szlumper (late Mayor of Richmond), Major Fox (London Salvage Corps), Captain Dyson (Windsor), and a number of representatives from the London County Council, the local authorities and principal fire-insurance companies. The afternoon was devoted to tests, first, with two double deal doors and two double oak doors; and then with a single "Jarrah" wood door and a single "Karri" wood door, the thickness of the doors in each case being 2in. The double oak doors appeared to have very considerable fire-resistance compared to the deal double doors, the test in each case extending to $1\frac{3}{4}$ hours. The "Karri" and "Jarrah" wood doors were unfortunately badly constructed by the makers, and, although the wood itself showed considerable resistance during a test of one hour, the fire appeared to get through where the joints had not been satisfactorily made. The full official reports will shortly appear in the usual way. It might be noted that the testing operations were somewhat hampered by the fog, all the photographs and records having to be taken by flashlight. Prior to the tests, Mr. Sachs entertained a party of officials and visitors at luncheon in the principal committee-room.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Party Wall Notices under the L.B.A.

E. H. D. writes: "A. and B. are adjoining and building owners respectively. A. has instructed me to act for him, B. having commenced pulling down and clearing his site for rebuilding. There are two walls built against each other, instead of a party wall dividing the premises. Both buildings are of old construction. I request B.'s surveyor to serve notice on A. in accordance with the Act. He declines to serve notice. My contention is that B. has no right to commence to pull down the external wall or take away support by clearing his site or shore up A.'s wall without having previously served notice on A. under Part VIII. of the Act. B.'s surveyor contends that there is no section under Part VIII. of the Act which compels him to serve notice on A. until he has cleared the site and determined what is required to be done; and if he does not require to excavate deeper than the foundation of A.'s wall, he is not bound to serve notice at all. My interpretation of the Act is that every building owner is bound to give notice to an adjoining owner before he commences to pull down, whether the wall is a party structure or external wall built against the adjoining owner's wall, and that it is an offence against the Act not to do so. Is this interpretation correct?"

B.'s surveyor is in the right.

Fumigating Oak, Preventing Condensation, &c.

Northampton.—Youngster writes: "(1) I wish to fumigate a large hall fitted up in Austrian and Canadian oak. How should it be done? In what vessel should ammonia be put, as I find it comes through glass and earthenware dishes? Why do the fumes darken the oak? (2) How is it possible to prevent condensation on a glass shop-front? (3) Would aluminium letters on a teak fascia board require much cleaning, as they will be 12ft. above the ground. (4) Where one's client decides to buy fittings direct, who is entitled to the builder's discount."

(1) The process of fumigating oak is described in detail on page 392 of our issue of December 19th last. Beeswaxing protects the oak, but imparts a disagreeable finish; oil is perhaps better, though the whole process of imitating antique oak is wrong in principle and much to be deprecated. The fumigation should not be performed in the hall itself, but the furniture removed to a small receptacle or room, otherwise everything will smell of ammonia for some time. Ammonia does not penetrate glass or glazed earthenware dishes. The cause of it turning the oak a dark colour is probably due to the tannin in the oak being resolved into gallic acid, which, absorbing oxygen from the air, turns black. (2) The usual method of preventing condensation is to put a high screen behind the window, with ventilation at the top near the ceiling, and to place close to the glass several Bunsen gas burners, which will keep moisture in suspension in the upward current of air they will produce. Condensation might be prevented by forcing up a current of warm dry air near the glass. In Russia we have noticed that boxes of salt are placed in the windows of houses to absorb the moisture, and they act admirably, though with the atmosphere heavily laden with moisture, as in a shop, the salt would need frequent replacing and be somewhat of a nuisance. Too much ventilation in the window would let cold air in there, and condense the moisture just where it is not wanted. The cold air should be brought in on the other side of the window back or screen. (3) The aluminium will not need much cleaning, though it will not remain polished without constant attention. (4) We think the client is entitled to the discount, but this should be clearly stated in the quantities. It is only fair, however, that the builder should be allowed to buy everything, so that he may have the advantage of gaining any extra discounts he may be able to obtain from his constant dealings with the manufacturers or merchants.

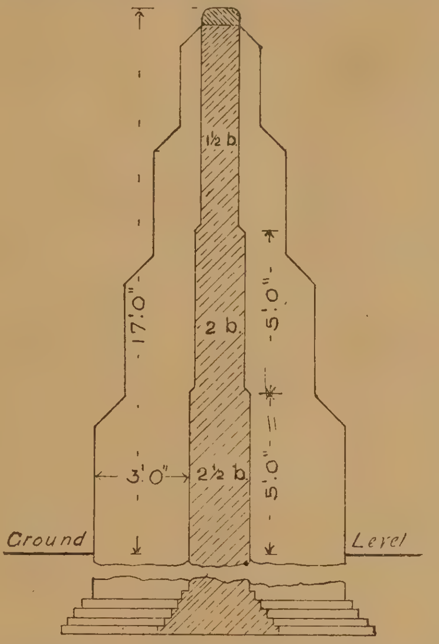
Skittle Alleys.

Bristol.—Luap writes: "I have to reconstruct a skittle alley. Kindly state the correct length and breadth, and other particulars."

See p. 45 of our issue for February 21st, 1900, and p. 344 of our issue for June 13th, 1900.

Stability of High Wall.

Whitley Bay.—A. H. writes: "I have to design a brick wall 17ft. high and 400ft. long. It has not to sustain any load, being merely a screen, and only the wind-pressure need be taken into account. According to calculation, allowing only the resultant weight of the wall about its middle-third to balance the wind-pressure, the thickness required seems to be ridiculously large. What it your opinion of the following section (not reproduced)? Do you think it excessively heavy? The wall would be built in 3 to 1 cement mortar. I have been unable to find anything written on this subject."



So far from querist's sketch showing too thick a wall, it is not substantial enough, and the writer would suggest that it be built in English bond of the accompanying section, with buttresses 12ft. centre to centre on alternate sides. If the wind is much stronger from one side than the other, the buttresses may be all on the side opposite to that on which the wind blows. The wall is estimated to be just safe with a wind-force of 22lbs. per sq. ft. on the upper section and 18lbs. per sq. ft. on each of the lower sections. This, of course, is much less than the reported values of wind-pressure in exposed places, and may not be sufficient for the case in point, but would be enough for ordinary town work. Without knowing all the circumstances one can hardly give a definite opinion, as another half-brick in thickness for the whole height might be necessary or an increase in the number of the buttresses. HENRY ADAMS.

Strength of Cast-iron Gutter as a Girder.

W. C. B. writes: "Kindly give a formula for calculating what weight the gutter shown on the accompanying sketch will carry at different spans."

This example (Fig. 1) partakes of the nature of a cast-iron girder with bottom flange, two webs and no top flange, and owing to its irregularity no exact calculation can be made. It may, however, be assumed as equivalent to a cast-iron inverted tee, as Fig. 2, having a flange of 15in. by 1½ sq. in. and web of 9in. by 1½in. The centre of gravity, and therefore neutral axis, of the assumed section, measuring from top edge, will be

$$y = \frac{d}{2} + \frac{\frac{1}{2}\text{BDT}}{\text{BT} + dt}$$
$$= \frac{9}{2} + \frac{\frac{1}{2} \times 15 \times 10\frac{1}{2} \times 1\frac{1}{2}}{15 \times 1\frac{1}{2} + 9 \times 1\frac{1}{2}}$$
$$= 4{\cdot}5 + \frac{118{\cdot}125}{36} = \text{say } 7{\cdot}8.$$
$$x = \text{D} - y = 10{\cdot}5 - 7{\cdot}8 = 2{\cdot}7$$
$$z = x - \text{T} = 2{\cdot}7 - 1{\cdot}5 = 1{\cdot}2.$$

The amount of inertia will be

$$\text{I} = \frac{\text{B}(x^3 - z^3) + t(y^3 + z^3)}{3}$$
$$= \frac{15(2{\cdot}7^3 - 1{\cdot}2^3) + 1{\cdot}5(7{\cdot}8^3 + 1{\cdot}2^3)}{3}$$
$$= \frac{269{\cdot}325 + 714{\cdot}42}{3}$$
$$= 327{\cdot}915, \text{ say } 323.$$

Working strength in tension = 1½ tons per sq. in., compression 7 tons per sq. in. Now, in all such cases Effort = Resistance, *i.e.*, Bending Moment (M) = Moment of Resistance (R), but the bending moment is $\frac{\text{W}l}{k}$, where W = load, l = span, k = coefficient of reaction = 8 for distributed load; and the moment of resistance $= \frac{\text{I}}{y}\text{C}$, where I = moment of inertia, y = distance from neutral axis to furthest edge of section, C = stress allowed = 7 tons per sq. in. in compression.

$$\therefore \frac{\text{W}l}{k} = \frac{\text{I}}{y}\text{C},$$
$$\text{whence W} = \frac{\text{I}}{y} \times \text{C} \times \frac{k}{l}$$
$$= \frac{328}{7{\cdot}8} \times 7 \times \frac{8}{l}$$
$$\text{W}l = 2355 \text{ inch tons.}$$

For l in ft.

$$\text{W}l = \frac{2355}{12} = 196,$$

or the safe distributed load for a span of 1ft. = 196 tons, and for any other span

$$\frac{196}{\text{span ft.}} = \text{tons distributed.}$$

HENRY ADAMS.

Liability for Kerbing Old Road.

Bradford.—X. Y. Z. writes: "A certain road has existed in a large provincial city for more than a hundred years. Forty years ago it was partly widened by the corporation and its name altered. Are the city council responsible for the kerbing, sewering, &c., if the road is developed as a building estate? The vendors would be prepared to give the land necessary for the widening in conformity with the building by-laws."

Querist does not give sufficient details of the exact circumstances to enable us to form a definite opinion on the matter. Has the road-

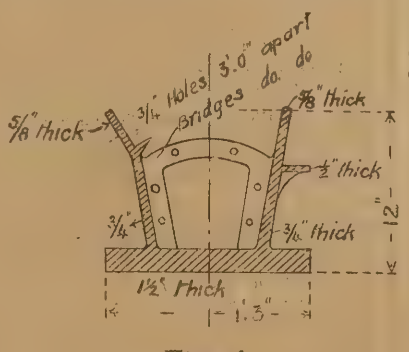


Fig 1

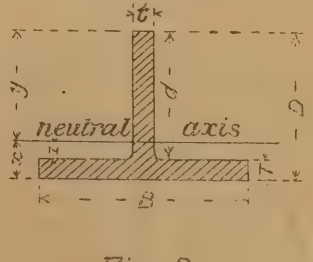


Fig 2

STRENGTH OF CAST-IRON GUTTER AS A GIRDER.

way in question ever been formally "dedicated" by the authority, and is it a "highway repairable by the inhabitants at large"? The probability is that formal dedication has not taken place, and that the latter clause of section 150 of the Public Health Act, 1875, applies. This states in regard to the making-up of "private streets" that "the same proceedings may be taken and the same powers may be exercised in repect of any street or road of which a part is or may be a public footpath or repairable by the inhabitants at large." The Act therefore enables the authority to call upon the abutting owners or frontagers to make up the whole of a street, if part of it is not repairable by the inhabitants at large, although the remainder may consist of an ancient footpath or may be otherwise repairable by the inhabitants at large. In the case of *Evans* v. *Newport Urban Sanitary Authority* an old road, repairable by the inhabitants at large, was widened by the adjoining landowner, and houses were built along it. The authority made up the road so widened under the section above quoted, and were held entitled to recover the expenses by virtue of the last clause of the section. Querist's case appears to be a parallel one to this, and, in the absence of further details, our opinion is that the authority are entitled to call on the abutting frontagers to bear the cost of making up the street in question. W. H. M.

Marbles for Floors.

LEEDS.—J. C. writes: "Which is the most durable kind of marble to use for a floor outside? It is to be in 9in. squares, black and white."

See an article on Marbles on pp. 230 and 239 of our issues for November 15th and 22nd, 1899.

Cellar under Roadway.

HASTINGS.—NIMANEB writes: "A. lives in a house fronting a main thoroughfare, and part of his cellarage extends under the public pavement. The road is to be widened, and will then come partly over the vault, which has apparently 9in. walls and arch only. What strengthening would be necessary to take the increased weight of traffic? Are there any recognised data for calculating probable weights and strains, &c.?"

When the traffic is entirely unrestricted, and road rollers, traction engines, boiler trollies, &c., may pass over the roadway, an allowance of 5 cwt. per sq. ft. must be made beyond the dead weight of material; but over a small bridge, cellar arch, or similar structure, allowance must be made for 8 tons concentrated on one wheel over centre of span, assuming it to be spread over a width of the arch equal to the depth below the surface to centre of thickness of arch. Querist does not say whether there are adjoining cellars, nor does he give the rise of the cellar arch. These are two possible methods of strengthening:—(1) To build two more 4½in. rings in cement inside the present arch, with the skewbacks on half-brick lining-walls in cement. If the centre upon which the arch is turned were limited in width to 18in. or 2ft. the extrados of the new rings could be packed close to the soffit of the old. (2) To uncover the cellar to the extent of the proposed widening, remove the arch, build 9in. brick wall in cement at each side within present walls, lay three 10 by 6 by 45lb. rolled steel joists over the space, about 2ft. 3in. centre to centre, on 3in. York stone templates 18 by 9, or 14 by 12; put temporary stage underneath, and lay cement-concrete within the full depth of the joists, resting on the back wall of the cellar and on a 6in. by 3in. by ½in. angle on the front edge. HENRY ADAMS.

The Annual Dinner of the York Architectural Society was held on Thursday last, Mr. C. H. Channon, F.R.I.B.A., presiding. In reply to the toast of "The Royal Institute of British Architects and Allied Societies," Mr. W. J. Locke, B.A. (secretary, R.I.B.A.) spoke of architectural registration, and said that so long as any scheme was put forward which did not recognize as a basis the sixty years of strenuous work and diplomas of the Institute, so long would the Institute refuse to act; and whilst so many qualified members of the profession in England did not join the Institute, it would not be in a position to go before Parliament with a cry for registration.

Law Cases.

Insanitary Angles of Drains.—At the Marylebone Police Court on November 29th a case was heard in regard to the drainage of 70, Canfield Gardens, Hampstead, the plans for which (prepared by Mr. Mark H. Judge, A.R.I.B.A., F.S.I.) were objected to by the Hampstead Borough Council. The Council's Sanitary Inspector Edmonds took exception to the new drain as constructed from the soil pipe at the back to the inspection chamber No. 2, as shown by the drawing on the opposite page, and he wrote to Mr. Judge on September 6th stating that the work "is being carried out contrary to by-laws, and I must therefore ask you to give instructions for the drain to be laid with an even gradient from end to end." The new drain thus asked for by the inspector is 75ft. long, exclusive of the old drain which Mr. Judge proposed to retain between inspection chambers 2 and 3, shown thus:— ▪ ▪ ▪ ▪ ▪ ▪ ▪ Borough Sanitary Inspector Smith on September 13th served on Mr. Judge's client a notice under the Public Health (London) Act, 1891, calling for execution of the following works: "Take out the defective drains and construct a new water-tight drain from manhole in front of house to soil pipe at rear." The borough medical officer of health on September 13th wrote to Mr. Judge objecting only to the length of drain between inspection chambers 1 and 2. He said, "What is necessary is a uniform gradient from the one to the other, without perpendicular fall." The new piece of drain thus asked for by the medical officer is 29ft. long instead of the 75ft. asked for by the inspector on September 6th. Instead of "an even gradient from end to end" the medical officer thus consented to allow these different gradients as follows:—46ft. with a fall of 1 in 15; 29ft. with a fall of 1 in 5; 36ft. with a fall of 1 in 30. The new drain asked for by the medical officer is shown thus:— × × × × × × It will be seen that the new drain as put in by Mr. Judge is below the foundations of the house. His strongest objection to both requisitions of the borough council was that to comply with them would involve needless and serious disturbance of the foundations. He further maintained that the new drain as laid by him and shown on the accompanying drawing was a thoroughly satisfactory drain in every respect. He contended that it most certainly had "a suitable fall" in every part, and that the vertical part had a bend at its foot in the same way as the two vertical soil pipes have bends at their connection with the stoneware drain. At the hearing of the case the sanitary inspector, the medical officer of health, and the surveyor to the Hampstead Borough Council gave evidence, and said a suitable fall was not provided where a drain was vertical, and therefore the drain as put in by Mr. Judge did not comply with the new drainage by-laws made by the County Council, and which had been in force since June last. Mr. Judge gave evidence, and contended that as a vertical soil pipe provided a fall which was accepted by the Hampstead Borough Council as suitable, the same rule must apply to the vertical drain which had been constructed under his direction and to his approval. The magistrate (Mr. Curtis Bennett), in finding for the Hampstead Borough Council, said, "In my opinion a suitable fall is not obtained where a drain is vertical, and therefore that part of the drain must be taken out and be reconstructed." Mr. S. N. P. Brewster, solicitor, said that he was instructed to appeal, and he asked the magistrate to state a case. The request was refused on the ground that the question was one of fact.

The Portland Breakwater Appeal Case.—On December 2nd the House of Lords gave judgment on the appeal of the Government from the decision of the lower Courts in favour of Messrs. Stewards & Co., coal merchants and quarry owners, Portland. It will be remembered that the latter claimed that they had a contract to supply 2,000,000 tons of rough stone for the breakwater at Portland. They were, however, only allowed to provide 254,928 tons, the Admiralty ceasing to draw from them on January 15th, 1898. The Department had, in accordance with the decision of the Liberal Government in 1895, been building the breakwater by directly-employed labour; but the close of its dealing with Messrs. Stewards indicated a change of policy, the work being transferred to a contractor.—The Lord Chancellor said the difficulties were such that each side had been able to argue plausibly. The question was, what had they agreed to? In 1895 the Admiralty were proposing to build a new breakwater at Portland, and not far from the site was the respondent's quarry, with a large quantity of—he would not say rubbish, but he might say, without offending Sir Robert Reid, stone of such inferior quality that the owners had a double object in getting somebody not only to pay for it, but to remove it, because there was probably no other market for it, and its disappearance would assist them in getting at better stone. In his opinion, the Admiralty did not agree to take either 2,000,000 tons or the amount that would be required for the breakwater. The only definite contractional obligation was that the respondents should supply when demanded such quantities of rough stone at such times as the Admiralty might choose, the price being 4d. a ton. In moving that the appeal should be allowed and judgment given for the Crown, he did so with reluctance, because the Admiralty and a responsible firm of contractors ought not to have left the Courts to determine what should have been perfectly free from doubt. The other Lords Justices concurring, judgment was given for the Crown, the defendants at the same time being ordered to pay the costs of both appeals.

Tunnels for Wires under Streets.—In the Chancery Division of the High Court of Justice on November 29th the case of *The Walker Urban District Council* v. *Wigham, Richardson & Co. (Ltd.)*—*Wigham, Richardson & Co., (Ltd.)* v. *The Walker Urban District Council* was heard. These cross-actions raised important questions under section 26 of the Public Health Act, 1875. In April last the company constructed a tunnel or subway (without the knowledge or consent of the Council) under Fisher Street, Walker, Northumberland, and so connected their premises on either side of that street. Mr. Justice Farwell, in delivering judgment, said that the action had resolved itself into the question of fact whether the company's pipes in the tunnel they had constructed were part of or placed in any structure which the local authority were entitled to remove. It was admitted that the company were the lessees of the land on both sides of the street, and that consequently the subsoil belonged to them. The local authority did not claim the subsoil, but relied solely on section 26 of the Act. The company, being owners of the land on each side of the street, were minded to take electric mains from the one side to the otber. But the local authority themselves supplied electric light, while the company got theirs from a rival source, and the real object of the action by the local authority was to prevent the electric mains from remaining under the road. The company built a tunnel with an arched roof, and sides, and floor of concrete, unquestionably in contravention of section 26, as no permission had been obtained from the local authority. Instead, however, of laying their wires in the *alveus* of the tunnel, the company cut away the concrete floor in the middle. Here was where the testimony for the company came in. He held as a fact that the company did cut right down to the clay below, though an inch or two of concrete might have been left here and there. Two pipes were then laid on the clay, ond two others on the top of them; 15in. of concrete were then laid on the top. The local authority now claimed that they were entitled to remove the whole structure, including the floor and the pipes in or under it. In his view, where the pipes now were was not part of the floor or of the structure, and he agreed with the company's witness that the whole tunnel could be removed without interfering with the pipes. It was not necessary on that view of the facts to consider the question of *bonâ-fides*, but a serious question might hereafter arise how far a local authority was entitled to use its powers against rival traders. As the general result the Council was entitled to the declaration it claimed, while the injunction granted by Mr. Justice Buckley in favour of the company would continue. The Council must pay the costs of the action by the company, and the company the costs of the other action.

An Architect's Claim for Commission.—The case of *Thompson* v. *Tolhurst* was heard in the King's Bench Division of the High Court of

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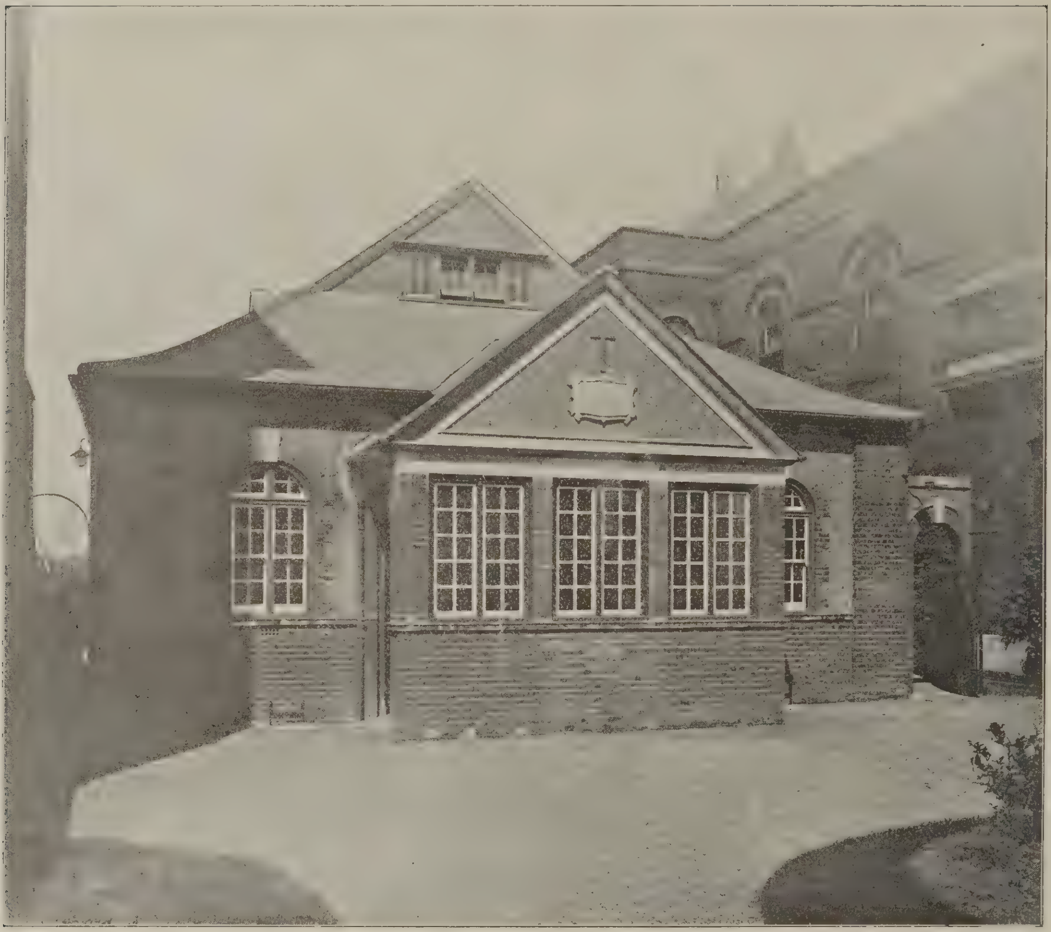

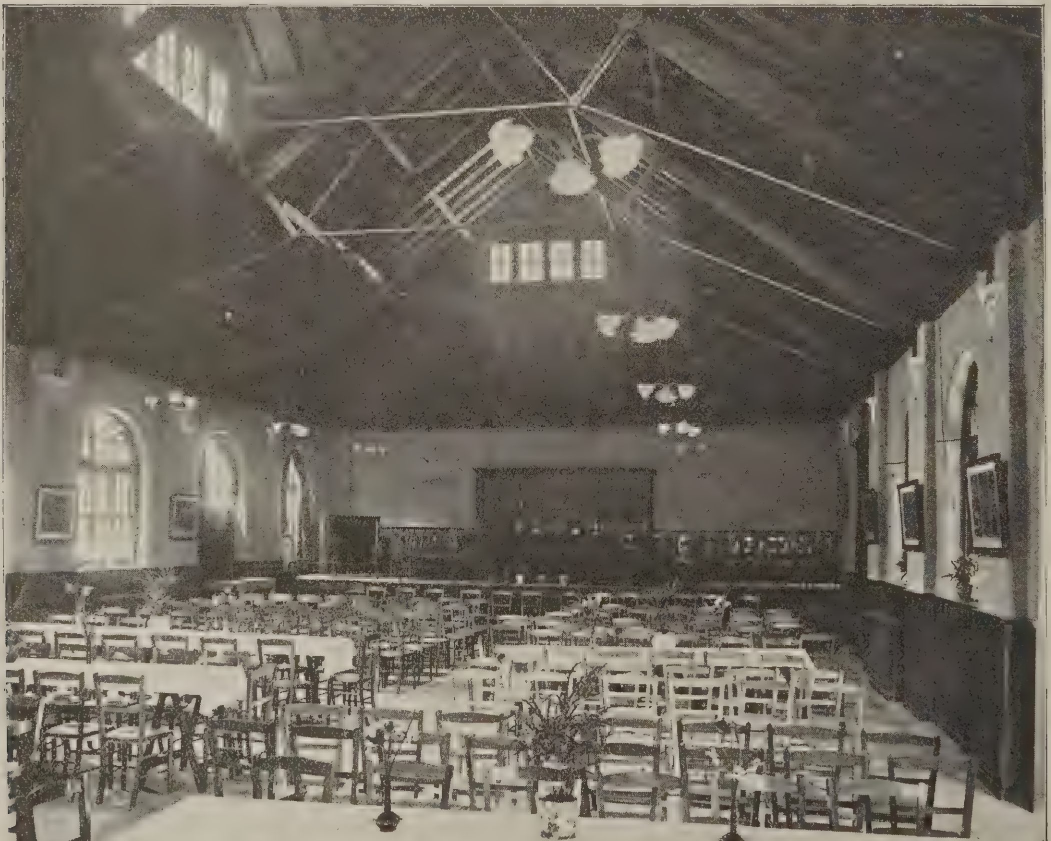

CAMDEN CHURCH MISSION ROOM. Arthur H. Ryan-Tenison, A.R.I.B.A., Architect.

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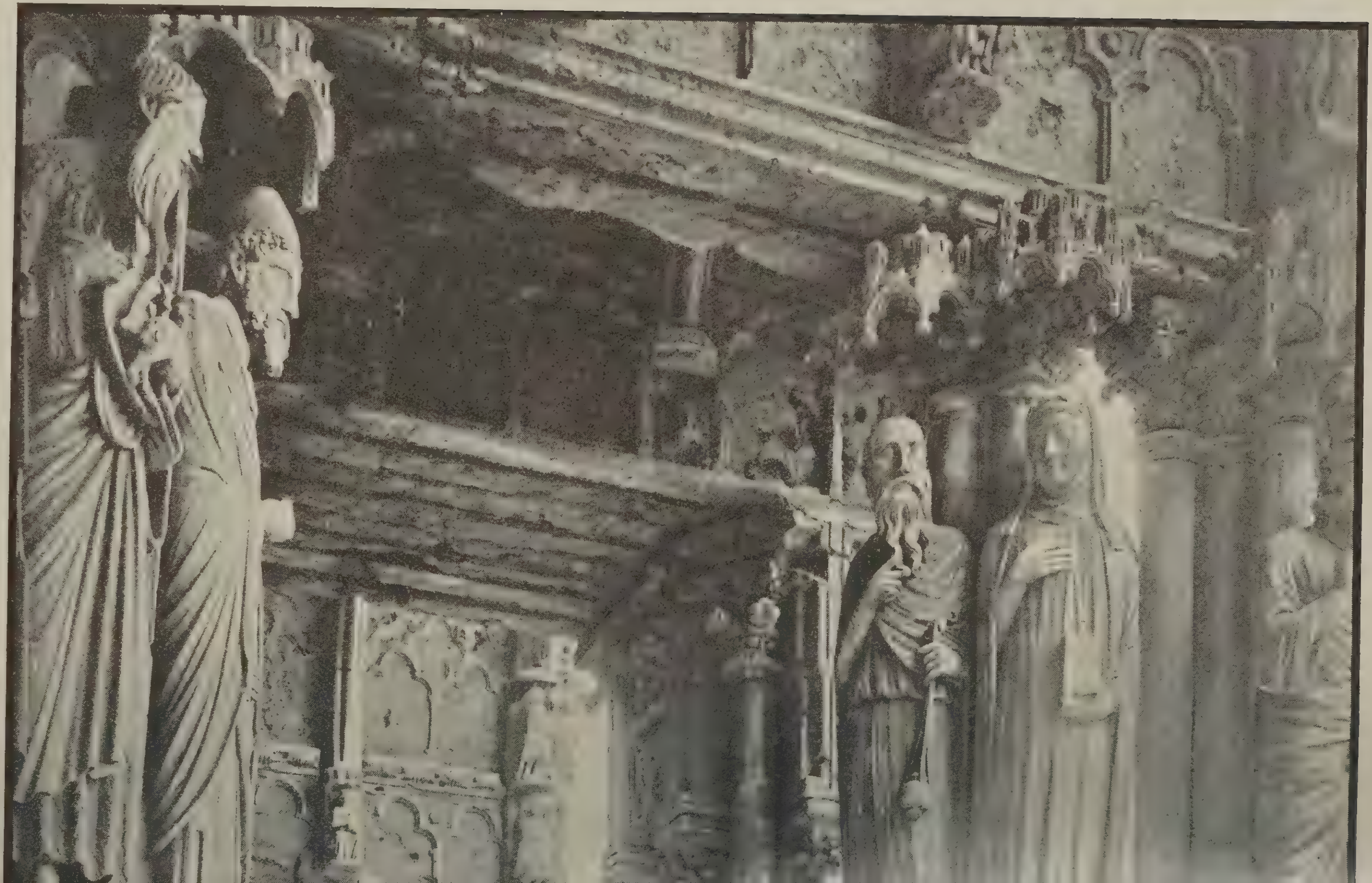

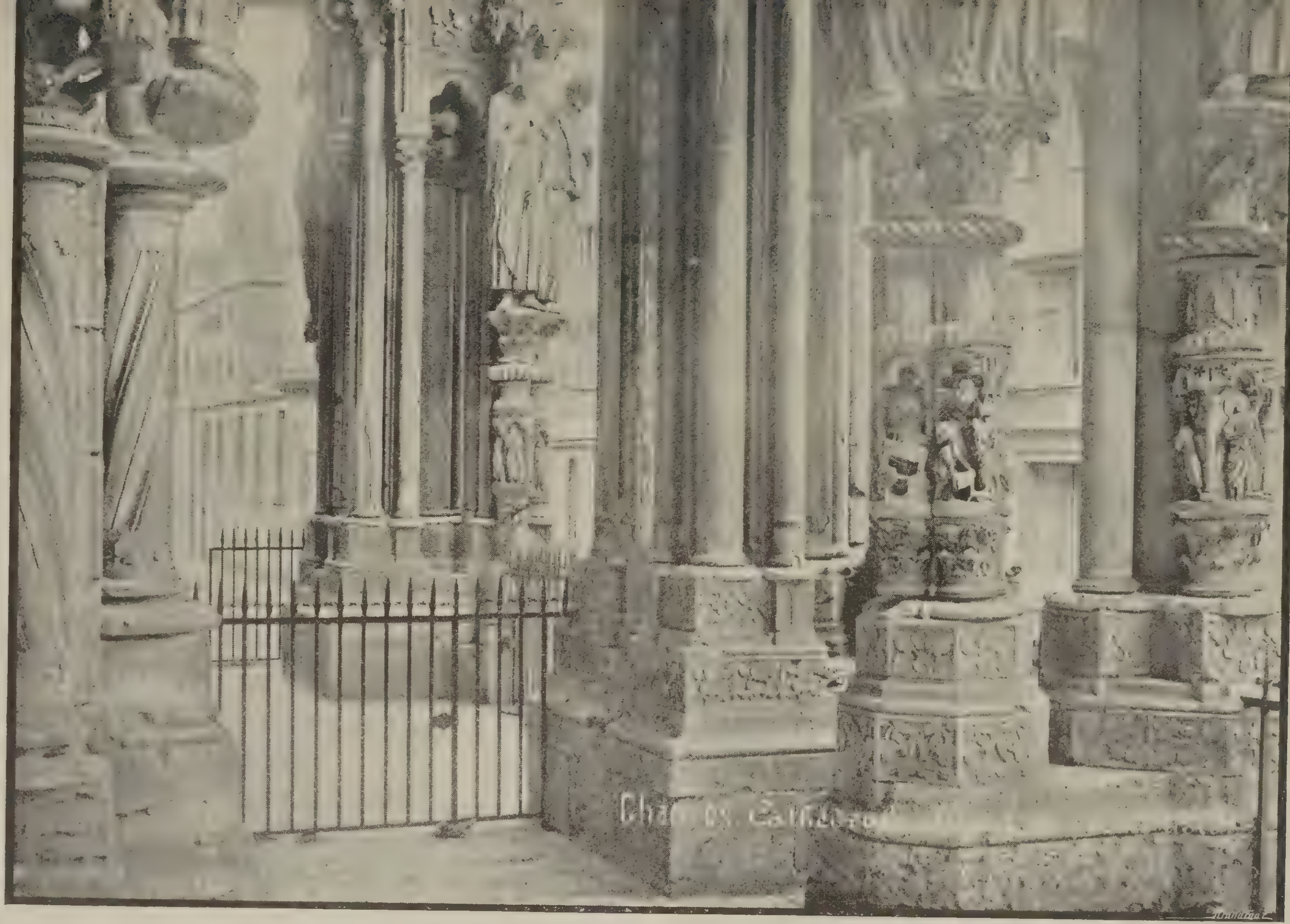

CHARTRES CATHEDRAL: THE NORTH PORCH.

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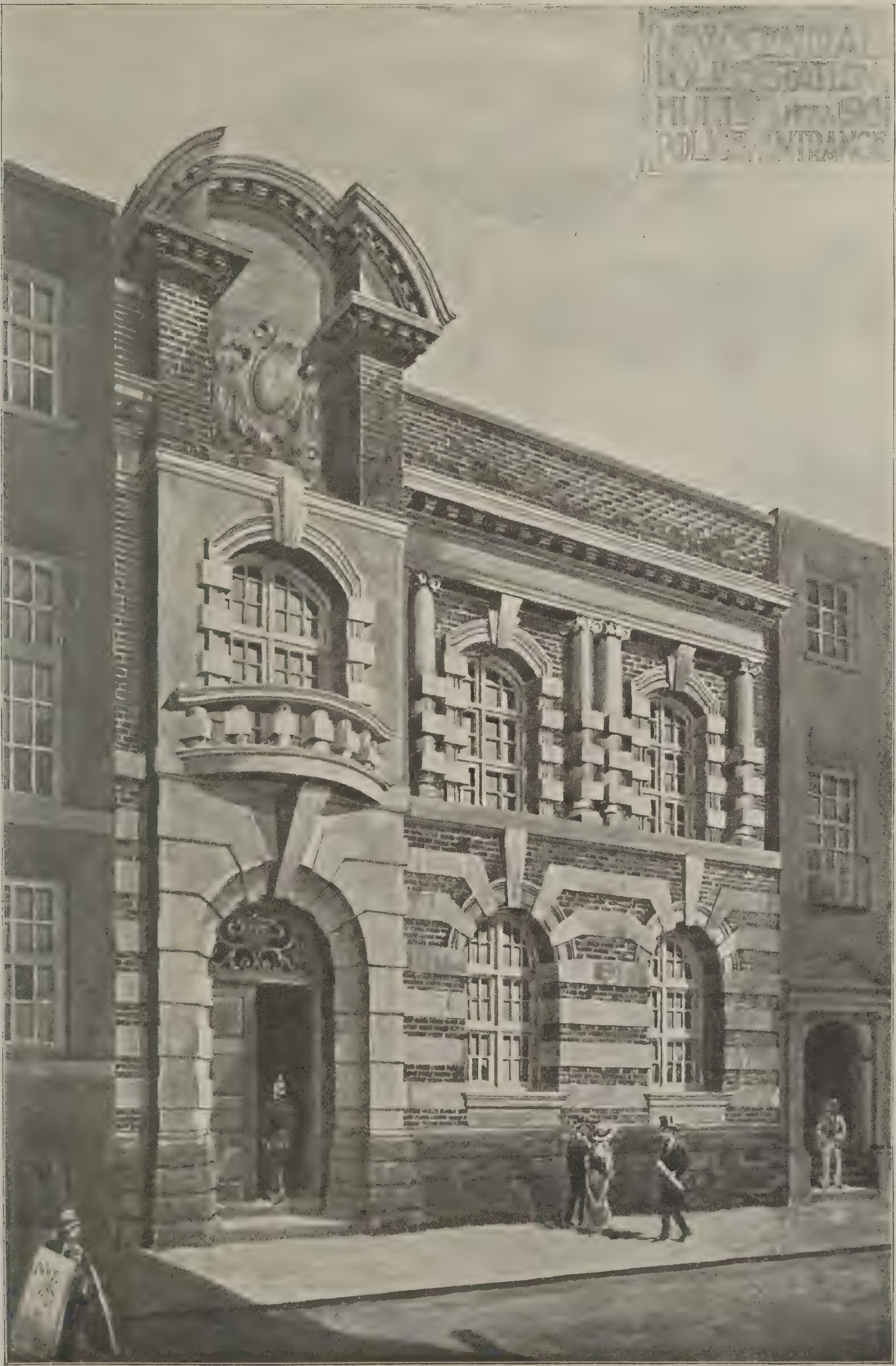

Joseph H. Hirst, City Architect, Hull.

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Justice on Thursday last. This was an action to recover commission. The plaintiff, Mr. James William Thompson, said that he was an architect, surveyor and land agent at Southend, and the defendant, who was a solicitor, was the proprietor of the Warrior Square Estate at that place. The defendant's affairs were conducted chiefly by his son, Mr. Bernard Tolhurst, who asked him if he could introduce lessees or purchasers, and said that the usual rate of remuneration would be paid. They agreed that there should be a fixed remuneration of 2½ per cent. for introducing a purchaser. As to leases, it was left to the usual terms, which were one year's rent. The plaintiff disposed of a plot to a Mr. Burdett, and the Hotel Victoria, of which plaintiff was architect, was built on it, and he was paid commission at 2½ per cent. in January, 1899. The plaintiff prepared plans for an hotel for another plot, and ultimately introduced Mr. F. D. Hayward; and the Hotel Metropole was built by him on the site. The plaintiff had received something under £3,000 as architect's fees for his five years' work. When he asked for his commission, the defendant's son said that the appointment as architect was the only remuneration to which he was entitled. A sum of £300,000 had been spent on the Hotel Metropole. The jury found a verdict for the plaintiff for £1,300, and judgment was given accordingly.

Correspondence.

Insanitary Angles.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In this age of the Universal Provider "Enquire Within upon Everything" may soon have to be announced over the entrance to our police courts. It speaks volumes for the character of our magistrates and the patience of our people that honesty of purpose has so long been accepted when it is patent to all concerned that the instrument of Justice is so often wanting in the technical knowledge without which an opinion is as likely to be wrong as right. When a sanitary inspector of a local authority differs from a qualified and experienced architect or engineer as to the inclination at which a drain should be laid, the Legislature, in its wisdom, has imposed upon our magistrates the duty of deciding between them, and thus it came about on November 29th, at the Marylebone Police Court, that Mr. Curtis Bennett decided that a new stoneware drain, bedded in concrete, proved to be sound and watertight and thoroughly well ventilated, should be taken out and reconstructed because he shared the opinion of the sanitary inspector that a pipe at an angle of 90 degs. with the horizontal did not give a suitable fall. Is this the discovery of an insanitary angle, or is it a gross interference with reasonable liberty? Because I constructed a drain with a vertical fall rather than endanger the foundations of the house by putting the drain several feet below them, can anyone seriously maintain that such a drain is, therefore, dangerous to health? If this cannot be maintained, has not the interference of the sanitary inspector reached a stage when some serious stand should be made against it?

The accompanying drawing shows the construction of the drain which has been condemned; also the soil pipe which is *not* condemned though it has the same "unsuitable" fall and is connected in the same manner to the same inspection chamber.—Yours truly,

MARK H. JUDGE, A.R.I.B.A., F.S.I.
Assoc. Society of Medical Officers of Health.

[A report of the case to which Mr. Judge refers will be found on the opposite page.]

Books on Elizabethan Architecture.

To the Editor of THE BUILDERS' JOURNAL.

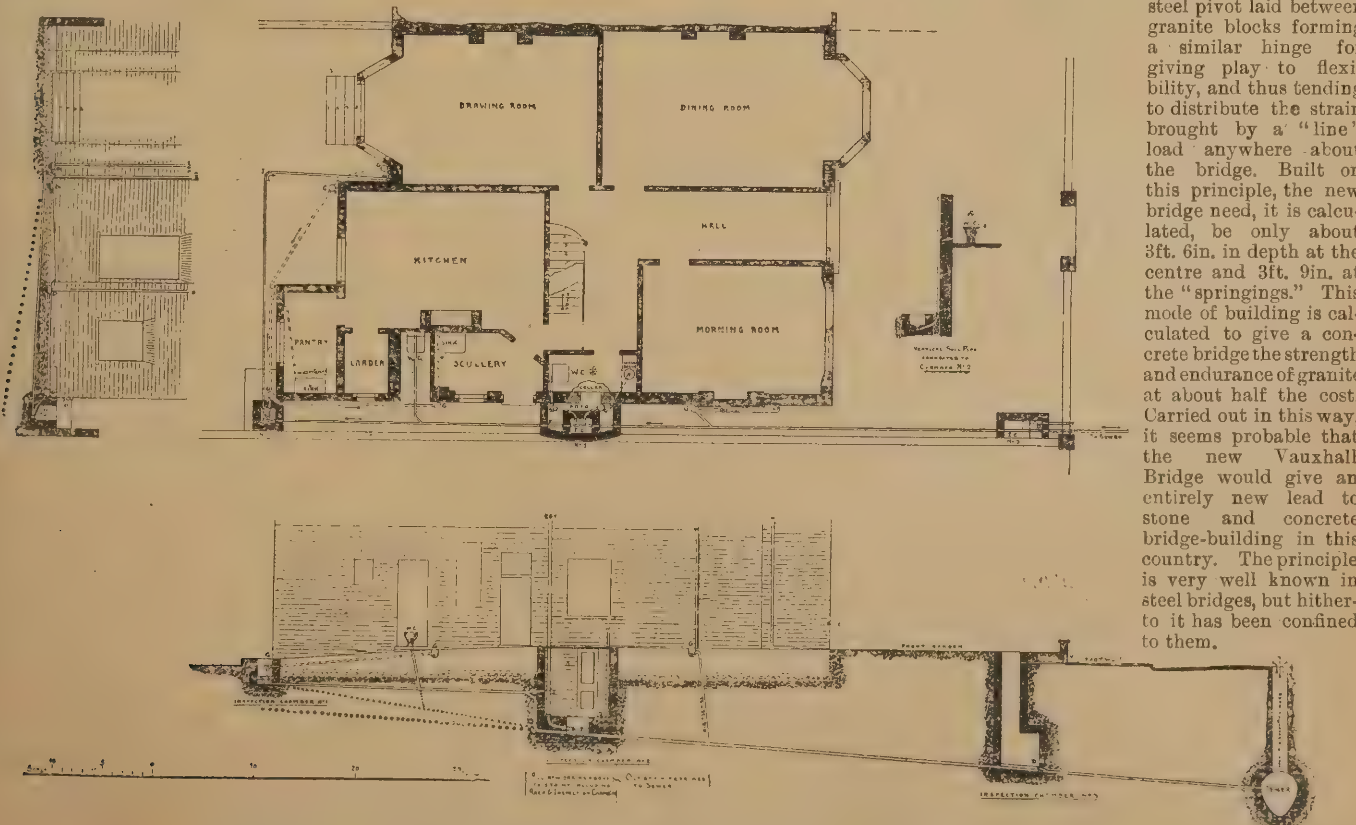
EXETER.

SIR,—Under this heading Mr. J. Alfred Gotch's new work on "Early Renaissance Architecture in England" was recommended in your last issue. In a review of this book which appears in the current issue of "The Antiquary" the following passage accompanies an illustration of the exquisitely-beautiful fifteenth-century font-cover at the church of St. Mary the Virgin, Pilton, in this county: "Font covers, with elaborate canopies from which they were suspended, are occasionally found of a Transitional character. Mr. Gotch gives a good instance (Fig. 1) from the church of Pilton, North Devon; the work on the top of the canopy is of later and coarser design. In the neighbouring church of Swimbridge there is a yet more remarkable fond-cover and canopy of similar date, which is not here figured." As a matter of actual fact, there is nothing of the sort! The spiral cover at Pilton is by far the fairest example of a fifteenth-century Perpendicular font-cover in the four south-western counties. The stationary triptychal font-cover at Swymbridge is quite a hundred years later—it is certainly not earlier than the middle of the sixteenth century. Pilton's font-cover has always been known as exceptionally pure fifteenth-century work. It is, therefore, more than a little surprising to find it illustrated as an example of "Early Renaissance Architecture in England." It is, however, perfectly correct that some early Renaissance panelling, &c., was put up behind this particular cover, and a canopy added by some admirer after the old cover had been *in situ* upon the font for more than a century.—Yours truly, HARRY HEMS.

VAUXHALL BRIDGE.

The System of Construction Adopted.

THE object of the new system of construction adopted for the new Vauxhall Bridge—at present embodied only in a model—is to give to stone or concrete bridges something of the elasticity which it has already been employed to give to steel structures, and by this means to permit of a great reduction in the necessary dead weight of the bridge and of the amount of material employed. If the new principle is finally adopted, each arch will consist of two distinct sections, divided from each other to the centre of the arch and from each abutment or pier. In other words, each arch will have a slit or division at either end, and another in the middle, instead of being one solid structure throughout. The bridge as a whole will be of concrete, but the ends coming together will be formed of solid blocks of granite. Across the width of the bridge there will be thirty-five of these granite blocks on each side of the slit. If these masses of granite were built into the bridge in the ordinary way, two rows of them would of course come together at the crown of the arch. But by this new system they are kept slightly apart by massive cast-steel pivots laid in sections between them. There is a steel groove let into the face of the granite on each side of the slit; and the steel pivot is laid in this groove, forming a sort of hinge between the two sections of the arch, paraffin wax being poured down into the groove to prevent corrosion. If a very heavy load is brought over a bridge the arches of which are constructed in this way instead of the fabric bearing up rigidly against the load, there is a slight flexibility. The crown of the arch is slightly depressed. The weight comes down upon the steel pivot in the middle of the slit and the pressure tends to distribute itself evenly throughout the arch. At each of the shore ends of the bridge there is a similar steel pivot laid between granite blocks forming a similar hinge for giving play to flexibility, and thus tending to distribute the strain brought by a "line" load anywhere about the bridge. Built on this principle, the new bridge need, it is calculated, be only about 3ft. 6in. in depth at the centre and 3ft. 9in. at the "springings." This mode of building is calculated to give a concrete bridge the strength and endurance of granite at about half the cost. Carried out in this way, it seems probable that the new Vauxhall Bridge would give an entirely new lead to stone and concrete bridge-building in this country. The principle is very well known in steel bridges, but hitherto it has been confined to them.



DRAINAGE OF 70, CANFIELD GARDENS, HAMPSTEAD; BY MARK H. JUDGE, A.R.I.B.A., F.S.I.

R.I.B.A. EXAMINATIONS.

November Pass List.

Of the 188 candidates admitted for the preliminary examination qualifying for Probationership R.I.B.A., held in London and the provinces on November 5th and 6th last, 37 were exempted, and the remaining 151 were examined with the following results:—

	Passed.	Relegated.	Total Examined.
London	59	15	74
Birmingham	8	3	11
Bristol	7	3	10
Exeter	3	4	7
Leeds	20	6	26
Manchester	17	6	23
	114	37	151

The names of the successful candidates, and of those exempted (making a total of 151 newly-registered probationers) are as follows:—W. L. Allen (Regent's Park), F. L. Atwell (Plumstead), H. J. Axten (Crouch End), C. H. Barlow (Widnes), J. J. Beck (Doncaster), A. L. Belcher (Brixton), W. T. Benslyn (Birmingham), H. E. Bernton-Benjamin (Windsor), A. Bolton (Bingley) A. Boulton (Dundee), T. Brameld (Hull), J. E. G. Burroughs (Bristol), H. Carnelley (Barnsley), W. Carver (City Road), E. S. Charlton (Tunbridge Wells), H. G. Cherry (St. Albans), C. Chippindale (Harrogate), H. H. Christie (West Kensington), W. T. Clark (Birmingham), W. T. Clarke (Liverpool), R. H. Cochrane (Dublin), J. Cocker (Timperley), G. S. Cockrill (Gorleston), H. R. Collins (Exeter), A. S. Constable (Stocksfield-on-Tyne), W. H. H. Cooke (Stroud), A. Cooper (Rickmansworth), F. C. B. Dabbs (Clapton Common), G. F. B. Daniell (London, S.W.), J. S. B. Davidson (Aberdeen), A. H. Davis (Kensington), F. M. Dean (Streatham), D. W. Ditchburn (Leytonstone), A. H. Douglas (Maida Vale), A. Douglass (Morpeth), G. B. Dransfield (Barnsley), W. T. Duncan (Rochdale), A. Dunn (Moseley), E. Edmonds (Stamford), A. H. Edwards (Leicester), A. C. M. Edwards (Rickmansworth), E. S. England (Blackpool), H. L. Etherington-Smith (Putney), E. W. C. Faulkner (Freshfield, Liverpool), W. G. Fearn (Clacton-on-Sea), H. Fielding (Accrington), A. H. Fitz-Roy (Lincoln), F. B. Foster (Leamington), H. J. Fox (Stamford Hill), D. S. Gardner (Weston-super-Mare), J. H. Goodchild (Crouch End), B. R. Gribbon (Leeds), A. H. Gully (Bedford), R. W. Gunson (Manchester), B. G. Gwyther (Egham), G. Hanson (Bradford) F. H. Healey (Bradford), J. H. Higgs (Leicester), H. H. Hill (Liverpool), J. R. Hobson (New Eltham), J. N. Horsfield, junr. (Kingston-on-Thames), W. H. Huckvale (Tring), A. H. Kirk (Pall Mall), F. R. Jolliffe (Penarth), B. W. Jones (Bexhill), G. H. Jones (Cardiff), L. de Barr Kelsey (Kensington), A. W. Kenyon (Sheffield), A. S. Killby (Highbury), C. U. Kilner (Bayswater), S. J. Lampshire (Devonport), A. A. Langham (Wimbledon), H. Langman (Southport), H. B. Laycock (Manchester), H. G. Lay (Wellingborough), T. Linton (Leith), J. H. Lowry (Liverpool), P. J. Maffey (Southampton), E. H. N. Major (Mecklenburgh Square), H. W. Markwick (Devonport), R. H. Mason (Birkenhead), F. J. Matthews (Clapton), M. G. St. John Maule (Huntingdon), F. C. Mears (Edinburgh), E. H. Mills (Shrewsbury), H. G. H. Mills (Southsea), A. M. Millwood (Barnes), E. Milnes (Rochdale), S. W. Mobbs (Lowestoft), E. Morley (Bradford), P. W. Mulready (Brondesbury), F. T. Negus (Woburn), W. H. Nevell (St. Albans), G. E. H. Newbold (Gainsborough), J. Norquoy (Chorlton-cum-Hardy), D. Mary O'Connor (Southall), S. S. Parkinson (Gravesend), G. Pemberton (Edgbaston), G. E. Peto (Bath), G. E. Phillips (Cambridge), A. P. H. Pierce (Auckland, N.Z.), A. E. Poley (Hampton Hill), W. D. Quirke (Camden Road), N. L. Reid (Leicester), A. G. E. Rebbeck (Frome), H. J. Roberts (Portmadoc), R. G. Roberts (Doncaster), A. H. Robinson (Birmingham), B. Royce (Leicester), W. P. Rylatt (Hull), H. Shackleton (Keighley), W. H. Shute (Newport, Mon.), E. H. Smith (Leicester), J. W. Smith (South Hampstead), J. C. Smythe (Mutley, Plymouth), R. G. Stevens (Bromley), J. D. Stevenson (Redhill), R. Stockton (Stockport), R. Stokoe (Sunderland), H. S. Stowell (Croydon), P. M. Stratton (Salisbury), L. W. Taylor (Newcastle-on-Tyne), C. E. Tebbs (Upper Tooting), F. W. Tempest (Sutton-in-Ashfield), E. E. Temple (Upper Norwood), C. à Beckett R. Terrell (Tonbridge), R. A. Thomas (Gosport), M. Thompson (Doncaster), G. M. Trench (East Dulwich), J. R. Truelove (Sharrow, Sheffield), R. F. Tucker (Upper Teddington), J. T. Turner (Wanstead), H. G. Turner (South Croydon), M. J. Wadsley (Hull), P. F. Warren (Norwich), A. J. Watson (Newcastle-on-Tyne), B. Watson (North Shields), R. F. Wheatly (Bromley), H. E. White (Moseley), R. W. White (Kentish Town), A. H. Whyte (Kensington), T. S. Wilcockson (Chesterfield), L. Wilkinson (New Southgate), H. A. Willatt (Nottingham), E. J. Williams (Leicester), J. R. Wills (Derby), R. H. Willson (Kingston-on-Thames), J. D. Winder (Wandsworth Common), A. T. With (Anerley), W. O. Wright (Morecambe), J. A. Yells (East Dulwich).

Intermediate Examination.

The intermediate examination, qualifying for Studentship R.I.B.A., was held in London, Bristol, Leeds and Manchester, on November 5th, 6th, 7th and 8th, with the following result:—

	Passed.	Relegated.	Number Examined.
London	29	23	52
Bristol	5	4	9
Leeds	3	4	7
Manchester	8	3	11
	45	34	79

The names of the successful candidates are as follows (in order of merit):—A. Scott (Glasgow), C. M. Crickmer (Regent's Park), H. W. Asman (Bradford), W. F. C. Holden (Cambridge), C. H. Brightiff (Southampton), W. J. Freeman (Halifax), A. Gilpin (Bristol), E. L. Hampshire (Rye Hill Park), V. C. Cook (Wolverhampton), D. Anderson (Hampstead), J. E. Mundell (Poole), C. B. Cleveland (Cambridge), B. D. Tracy (Camden Road), J. H. Taylor (Battersea), J. Wilcock (Bradford), C. P. Moss (Crouch Hill), H. Slater (Preston), K. D. S Robinson (Westminster), C. H. Heaton (Wigan), H. R. Crabb (Exeter), W. B. Colthurst (Taunton), A. R. Crisford (Eastbourne), P. A. Horrocks (Bolton), E. M. Ellis (Fenchurch Street), P. R. Strong (Balham), F. Sykes (Manchester), F. G. Brooker (Peckham Rye), W. T. Curtis (West Dulwich), S. H. Rainforth (Lincoln), J. W. Jarvis (Moseley), H. W. Stone (Taunton), J. T. W. Brooke (Bowdon), R. W. A. J. Cosway (Wandsworth), E. Harding (Brixton Hill), Florence F. Hobson (Belfast), E. R. Kennedy (Belfast), S. Maddock (Frodsham), L. Morris (New Brompton), B. S. Murphy (Edinburgh), W. R. Osborne (Swindon), F. J. M. Owen (Liverpool), S. H. Penlington (Sunderland), E. R. Sladen (Bourne End), J. B. Smith (Bedford), C. J. Thompson (Wandsworth).

Final and Special Examinations.

The final and special examinations, qualifying for candidature as Associate R.I.B.A., were held in London alone from November 15th to 22nd. Of the 63 candidates examined the following 35 passed, the others being relegated to their studies:—C. T. Adshead (Stockport), S. W. Bensted (Wandsworth Common), E. G. Besant (Cambridge), A. E. Biggs (Felixstowe), A. B. Botterill (Streatham), C. A. Broadhead (Nottingham), H. Busbridge (Plumstead), R. S. Cockrill (Great Yarmouth), W. J. Devlin (Adelphi), W. E. Dobson (Hampstead), W. W. Ellison (Erith), J. Ewing (Regent's Park), E. L. Gaunt (Ilkley), A. E. Gibbins (Islington), F. R. B. Haward (Marylebone), R. E. Hemingway (Nottingham), A. E. Hughes (Regent Street), A. T. Hussell (Ilfracombe), E. W. Lees (Mecklenburgh Square), H. L. E. Merille de Colleville (Brighton), E. B. Norris (Birmingham), L. R. Oakes (West Kensington), H. F. Ponton (Hammersmith Road), W. B. Rees (Cardiff), C. H. Reilly (Victoria Street), F. G. Richardson (Tufnell Park), E. G. Rodway (Weston-super-Mare), G. L. T. Sharpe (Barnes), W. Slater (Nottingham), F. D. Smith (Victoria Street), T. M. Smith (Tollington Park), W. S. Tucker (Newmarket), A. H. Verstage (Camden Square), J. A. Woore (Derby), E. L. Wratten (Croydon).

The following shows the number of failures in each subject of the final examination:—

I. Design	23
II. Mouldings, &c.	18
III. Materials	11
IV. Sanitation	13
V. Specifications	1
VI. Construction: Foundations, walls, &c.	11
VII. Construction: Iron and steel, &c.	10

The Ashpitel Prize.—This prize has been awarded to Mr. C. T. Adshead (Probationer 1894, Student 1897), he having most highly distinguished himself in the final examinations this year.

A Special Prize of books (value £10) has been awarded to Mr. F. Dare Clapham, in recognition of the merit displayed by him in his work at the special examination held last June. Mr. Clapham obtained the highest number of marks ever awarded at the final and special examinations.

UNDERGROUND TRAMWAYS.

THE L.C.C. REPORT.

The London County Council have just issued the joint report made by their tramways manager (Mr. Alfred Baker) and their electrical engineer (Mr. John H. Rider) on the construction and working of the Boston underground tramways and the Rapid Transit Subway now being constructed in New York; with an addendum by Mr. J. Allen Baker, vice-chairman of the Highways Committee. The main facts about these tramways have already been published in our columns, but the report affords some interesting particulars of the methods of construction adopted at Boston. The subways there are of three distinct types. In the first, the side walls and the arch are of masonry, a single wide arch covering the whole subway. In the second there are two distinct tunnels side by side, each built of masonry. In the third upright steel columns for the side walls and transverse steel girders for the roof are used, with masonry and concrete around and between them. The open inclines leading to the surface roads have granite walls, and are protected by railings. The standard height of the roof is 14ft. clear above the surface of the rails, and the roof is generally about 3ft. below the street-surface. In some places, however, the subway is considerably lower than this. One of the most important differences between a shallow subway and a deep-level tube, from the point of view of the travelling public, is well illustrated at Boston. Instead of having to descend a very great number of steps or enter a lift in order to reach the cars, passengers use a short well-lighted stairway, having from twenty-five to thirty steps. Persons can thus descend to the platforms or ascend to the street in a very few seconds.

In New York, instead of the arched roof and massive masonry walls of an ordinary underground railway, the plans of the Rapid Transit Commission call for a structure rectangular in shape and built in an open trench. On a concrete bottom will be erected, at intervals of 5ft., running across the line of street, frames of steel beams securely riveted together. Between these frames, or ribs, will be built a concrete wall and a concrete roof of sufficient thickness to enclose the steel structures entirely. In addition to the side walls thus formed, the roof will be supported by rows of light steel columns between the tracks. The contract price for the construction of the subway was £7,000,000. Mr. Baker and Mr. Rider express the opinion that by the construction of shallow underground subways in London two important objects would be gained: (1) A method of linking up existing tramways by taking surface cars underground through congested and, what might be termed, prohibited areas. (2) A provision for pipes, cables, wires, &c., which would obviate the continual breaking up of the streets. The ideal form of transit, in their opinion, is the one proposed in New York—a subway, easy of access from the street, catering for express and local traffic (as explained on p. 239 of our issue for November 20th last).

A New Hotel at Bath, named "The Empire," has been opened by Messrs. Spiers & Pond, Ltd. It is built of Bath stone, and is the largest in the city, providing for over 200 visitors. The architect was Major C. Davis. There is the usual open lounge and spacious reception-rooms and corridors, and also ten complete private suites in the building, which has been erected by Messrs. J. Long & Sons, of Bath. The furnishing has been carried out by Messrs. Smee & Cobay, of New Bond Street, W.

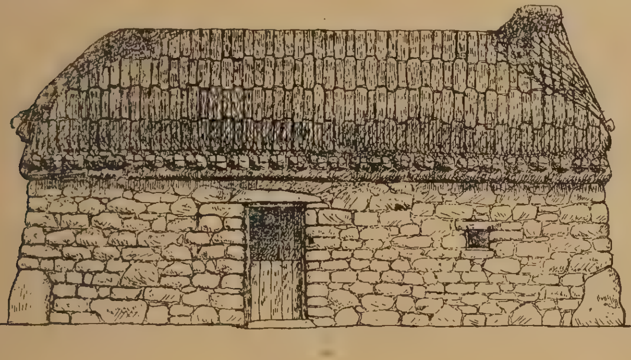
BUILDING CONSTRUCTION.

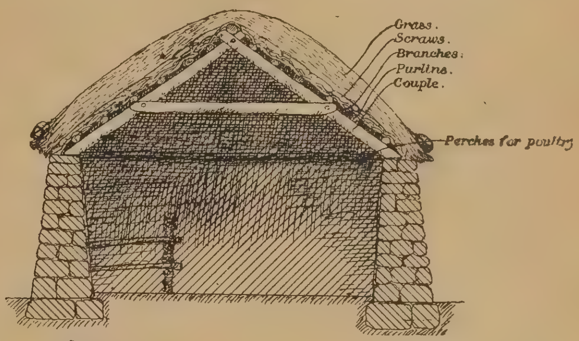
(*Continued from p.* 286 *of No.* 356.)

53. THESE articles on forces applied to structures go a very short way, but they go far enough for the *needs* of a practical man, who, if he is curious in this direction and has a taste for mathematics, may go as much further as he likes. In my endeavour to be practical I have written from my own experience of the kind of calculations which arise in ordinary office-work. The subject is a department of mechanics. I have tried to pick out, without any show of want of sequence or incompleteness, the questions which arise in building construction. The student may reasonably assume that if he studies these articles and understands them he will be prepared to deal quantitatively with any strength question, moderately determinate, likely to arise in building practice. It is surely of advantage to have the essential things selected and put in concise order. We know that the pendulum of a clock does not fulfil all the conditions of a "simple pendulum," but it keeps time with sufficient accuracy for practical purposes. We know that no two separate pounds of sugar weighed out to customers by a grocer are of exactly the same weight, and that no two separately cut yards of cloth sold by a draper are of the same length, but the weights and lengths are practically correct. It is not sought to be conveyed that any carelessness of estimate or measurement is pardonable; this is not so. The test of accuracy in a clock's pendulum is that the clock will keep time; of the grocer's and draper's accuracy, that their customers reweigh and re-measure and are satisfied, and that the quantities sold agree in their totals with the quantities which the grocer and draper bought wholesale. A constructor must design safely and economically.

The few principles which have been illustrated and dealt with are of very frequent application in very different ways, but the student must not for a moment think that they are restricted to the cases given. For example, some of the considerations in connection with beams fixed at one end apply to a pillar to which a heavy gate is hung, or to a wall or chimney in a wind. The question of distribution of pressure between surfaces which has been considered in reference to arch voussoirs, and again the same principle in connection with the consideration of the centre of pressure at cross-sections of struts, is one of very wide application. But it is not necessary to multiply instances.

These few words must not be taken as any "farewell address" to force calculations. On the contrary, the student has been introduced to principles which it is to be hoped will remain in his mind for everyday application and extension. It is to be feared that building students have not hitherto had their attention sufficiently directed to this *fundamental* part of their work.





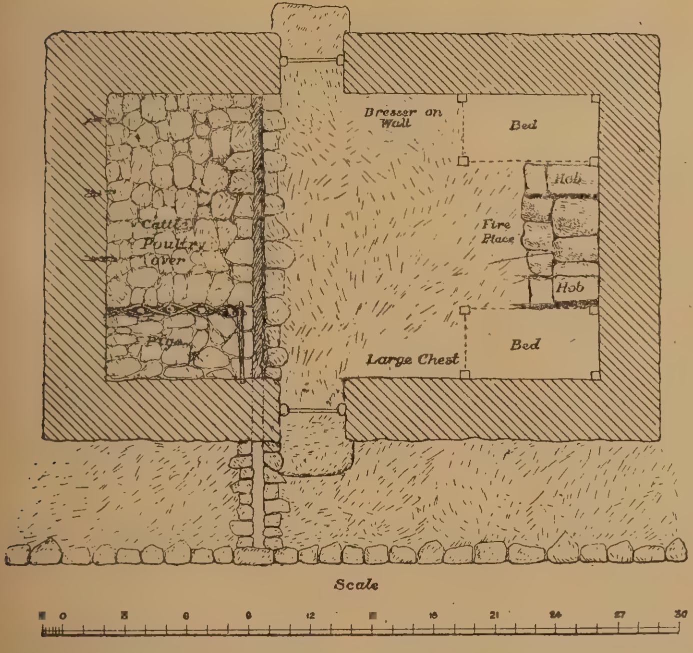
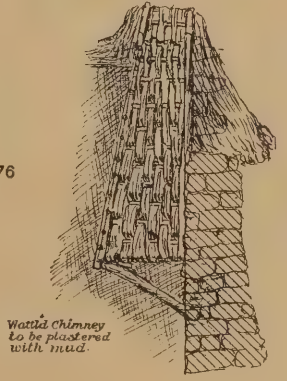


FIG. 76



Wattld Chimney to be plastered with mud.

House-building.

54. There is no human construction that does not exhibit care and carelessness, wisdom and lack of wisdom; and it is the business of the student to see both sides and to profit by what he sees. The new syllabus for the South Kensington examinations suggests that the natural course of building education is to commence with elementary buildings and to proceed from these to more complex buildings, or, as a naturalist might express it, to buildings showing high specialization of function. There are minute animals called amœbas, which consist of small sacs with a hole or opening. They appear to be simple detached stomachs: they may be turned outside in, and it is found that they thrive just as well, and what was the outside skin is found to perform the functions of digestion and the previous inside stomach-surface equally well serves for an outside skin. The simplest kind of house or shelter is probably the piece of bark with which the Tierra del Fuegan shields himself from the cold wind as he moves about. The Australian blackfellow sets up three pieces of bark to shelter his head and shoulders when he sleeps. We are aware that we skip a large number of terms in our advancing series when we take a Connemara cabin (Fig. 76) as our starting-point for the study of house-building. We are further discriminating, because our Connemara cabin is a specially good example and we shall find admirable construction points in it. The builder of this cabin has as good grounds for pride in his work as the builder of many more pretentious houses. In judging a man's work we must take account of all the circumstances. This single-roomed house to shelter the Connemara peasant and his live-stock is what he can afford, and it must be made of such materials as he has at hand. In some places he cannot get lime within miles of his house, and so he must build with very little lime. The walls are dry-built of granite (in the house shown) and the inside is pointed and rough-plastered with mortar; when it can be afforded the outside is also pointed, and when this is done the house is fairly warm and comfortable—warmer than a solidly mortar-built house because the air enclosed in the dry walls is a non-conductor. The house has two doors, as some people think (and, indeed, as the people who live in the house will tell you), so as to use either side for entrance when it happens to be the lee side. There is something in this, because if you observe the window you will see that an open door is needed to give light; but the two opposing doors have another function—the peasant's small growing of oats is winnowed on the floor in the current of wind between the two doors. We, pampered people, know that a door opening directly from the outside is a draughty arrangement, and we protect ourselves with a porch and second door. It is still more draughty to have these two badly-fitting doors opposite to one another, and to mitigate the draught the closed-up door is lined inside with a plaited-straw mat (*sugan*, a paillasse), which is held up close to the door and the side chinks with raking props. The enclosure for the pig must be very strongly paved and secured, because these animals can perform wonders of destruction with their snouts. The fastenings for the cattle are hooked branches of bushes built into the wall. The bed mattresses are *sugans*. Other sitting accommodation is provided by stools (not shown). The principal table is the lid of the chest; the dinner is potatoes, and the dinner-table is a flat basket placed on a bucket or stool. The roof is peculiar; the thatch is not of straw, and it is not secured with scollops. There is not much straw available, and scollops are not to be had; hazel bushes do not grow within twenty miles of this house. Note the network of roping and the row of stones along the eave. The foundation for thatch is prepared in the usual way: that is, a few collar-braced rafters (couples), pegged together with wooden pegs, are set up, then some rough branches are laid across them, and over these small branches are laid, lying up and down the slope of the roof. On these are laid "scraws," which are sods of a suitable kind skinned off the land very carefully and carried to the house in large rolls—one of these scraws may be 2ft. wide and 10ft. long. The thatch is coarse sedgy grass, laid on carefully up and down the slope of the roof in sufficient quantity to give the proper contour, without any fastening; it is held in its place by the network shown. In

many of the cabins the work is badly done; ordinary straw-thatching is apparently imitated and the side of the roof is given a plane surface. Now it is easy to see that if there is not a rounded surface the network cannot give support or pressure to the grass thatch, and flat thatching is therefore bad and unscientific. The cords are mostly twisted, made from the same grass which is used for thatch; but cocoanut-fibre string is not uncommon—it stands the weather well and it is lasting. A rounded waggon-shaped roof is successful in this case, for much the same reason that it is successful as a felted roof. If you cover a flat piece of boarding with felt, any wind that gets inside (through a door or other opening) lifts the felt off the boards, the nail heads pull through and the felt is carried off. With a waggon-roof it does not lift off; any attempt to lift at any part tightens it against the boards at every other part, and the friction against the boards helps the nails to keep the felt in place. The drawing shows the strings held down by stones along the eaves; they are quite as frequently fastened to pegs driven into the walls below the eaves. The drawing also shows the thatch covering the ends (the roof hipped) of the house, the gables. This is not the most common way, but it it is the best way. With ordinary thatch a gabled house has the barges made to the thatch with mortar, and some care is taken with mortar flashings to the chimney stacks. This cannot well be done with loose grass thatch, and, as commonly done, the barges are a very unsatisfactory job; the method shown is quite good. This is the necessary kind of roof where the walls of the house are of dried mud (whether thatched with straw or grass), and with mud walls the eaves must be more projecting than as shown. If we take full account of all his surroundings, the builder of one of these humble dwellings may be a brother member of our craft who is fit to hold up his head among us.

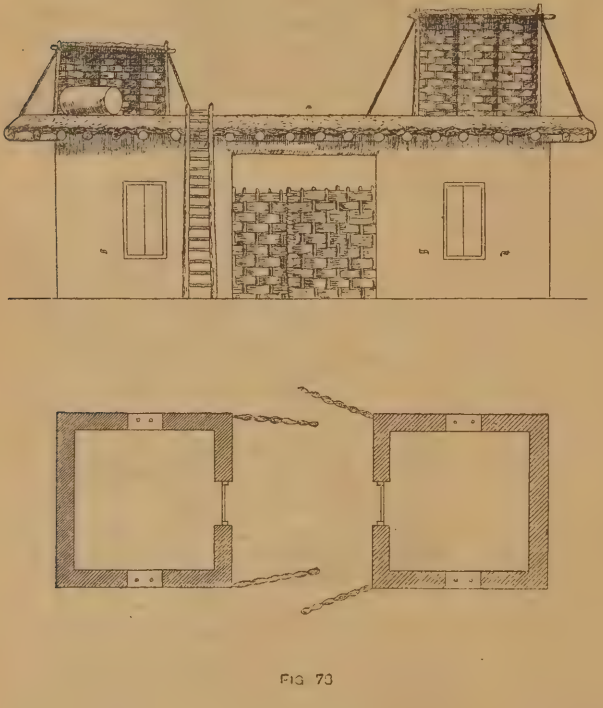


Fig 78

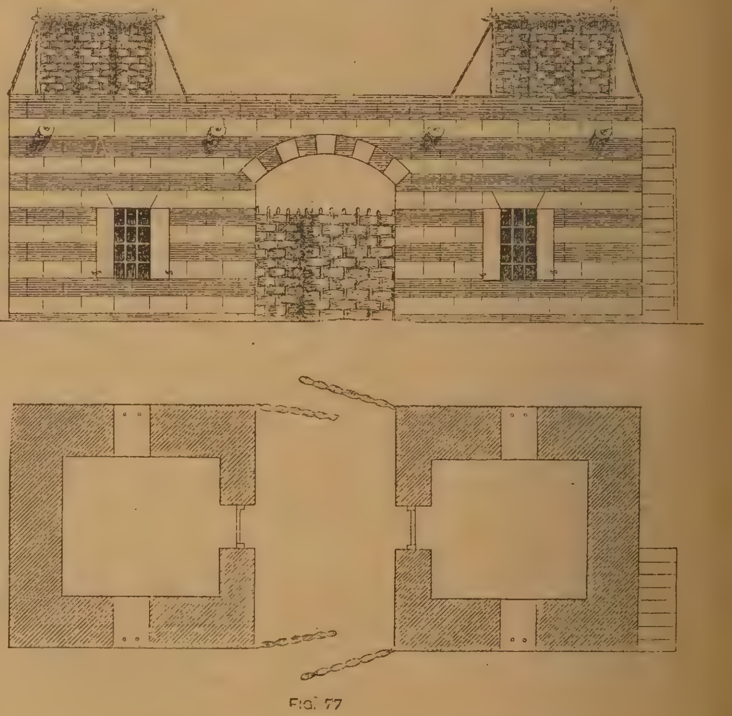


Fig. 77

55. Let us watch a man thatching with wheaten straw. He is putting on a "new coat" of thatch; he has moved his ladder, which lies evenly on the old thatch, and now marks the extent of the strip he is about to lay. The edge of the work he has before completed is kept from spreading by a number of straight scollops (hazel rods) stuck at right angles to the roof close to the edge of the new straw; he takes a handful of wheaten straw, regulates the butt ends with the palm of his right hand while he lays it in its place, then another and another, till he has as much as a scollop will properly span; he bends his scollop into a flat staple and thrusts it into the old thatch, enclosing the new. A second scollop brings him to the side of the ladder, then he takes a third and a fourth scollop, bends them sharp in the middle and pushes them in so as to hold fast the centres of the first pair; he lightly settles the scollops with his mallet, and repeats the operation till he reaches the ridge, where, if he is an artist, he finishes in looped and twisted handfuls of straw which are made fast by scollops in the loops in a way to remind one of the dowelling of roll ridge-tiling. The operation is exceedingly simple. Why does not the small farmer or peasant do his own thatching? Why also does he not make his own baskets and heather brooms or besoms? How many of us know the difference between a granny's knot and a reefing knot? Can anybody but a shopman make up a neat paper parcel? If we are to control workmen we must have their respect; if we are to have their respect we must understand their work. We must not only know bad work; we must know why it is bad work. We can only come to this knowledge by effort, and by becoming familiar with workmen, watching them intelligently at work and occasionally taking a hand ourselves.

56. Fig. 77 shows a Syrian house built of stone, such as may be seen in the neighbourhood of Beyrout. Because timber is expensive the walls are thick, and the roof is formed by vaulting. The face work is ashlar in alternating bands of light-coloured and dark-coloured stone. The roof is flat, and has a parapet. There is an outside stone stairs, and there are two shelters formed of cane mats on the roof (except in the rainy season the roof is the sleeping place). The opening through between the rooms is really the living room, and is designed for draught and coolness; the cane mats shown enclose the place and give privacy to the family. The windows are barred openings which may be closed up by the shutters shown. The way in which the centering for the vaulting is formed is as follows: Some pieces of timber are put up on sufficient supports, either timber or temporary dry walling—hewn pine pieces, kept to be let on hire for this purpose and charged for if cut or damaged in any way—the spaces between the planks are spanned with spauls of stone, and this is covered with mud which is worked to the shape of the vault. When the mud has dried so as to be fairly stiff it is covered with sand which is pressed firmly, and on this the sheeting is worked. It was a common plan in our own country to use wicker hurdles as lagging for vaulting. This house has a low parapet, four gargoyles are shown, and it has the usual flat roof of a Syrian house. There is no chimney. Cooking is done over small charcoal fires kept bright by the use of a feather fan, and only alight when they are required for cooking. Why are these roofs flat? What is the use of the small stone roller to be seen on every housetop (shown in Fig. 78)? The reason for the roofs being flat is very simple and natural: the roof is of clay or of a mixture of clay and lime, and it must be flat to prevent strong currents of rainwater washing it into channels and destroying it. The roller is for rolling the roof to close up cracks and generally consolidate and make the roof good during the "welcoming month" before the rainy season sets in.

57. Fig. 78 shows a house of the same character and giving the same accommodation as Fig. 77, but it is built of unburnt sundried mud blocks instead of stone. Houses of this kind are to be seen at Zahleh in Lebanon, where the eastern slope of Gebel Sunnin approaches the plain of the Bukaa. A brawling stream from the mountains runs through the little town, and on its banks some poplars grow; these poplars appear to furnish the poles to carry the clay roof. There are many other places where the houses are of mud (Damascus is a mud-built city). The poles are cleared of their bark, and when one gets inside the building he finds that peeled small branches have been laid to form simple patterns lying on the poles, showing appropriate ceilings having a good decorative effect. The doors of these houses have wood hinges; they are fastened with wooden locks which are opened with wooden keys. The projecting eaves protect the mud walls from being washed by the heavy rains of the rainy season. Fig. 79 shows one of these locks with its key. The "Encyclopædia Britannica" says: "The earliest lock of which the construction is known is the Egyptian, which was used four thousand years ago." This is the common lock used on the doors of these Syrian houses.

58. Have such elementary buildings any architectural value? The Eastern houses between which and the Connemara cabin some comparison is suggested are not nearly the poorest kind of dwelling to be seen in Syria. There is evident intentional efforts at decoration, and they also have a satisfactory effect when seen from a distance. A village of these houses built on rising ground, placed as the houses of Eastern villages are, without any regard to regularity in respect of road or street and mixed with the green of a few mulberry bushes or similar things, is a very pleasant sight. The builder of such houses has very little room for the display of originality; he works to a cut-and-dry design, a type as permanent as the dress which poverty makes unchanging in countries where people can barely live. Yet in such houses there is room for the display of taste and skill.

I must not be understood as saying that habitations like the Connemara cabin are satisfactory for human beings to live in. We have a Public Health Act, and we have sanitary

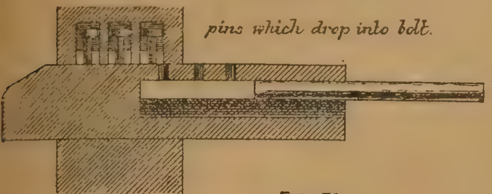
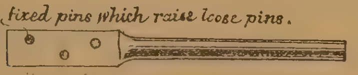


FIG. 79



KEY

officers and inspectors, and we have laws by which the district council may build suitable houses for labourers; but these remedies do not touch, in any practical way, the evil. Where the ratepayers of a district are all equally poor, they cannot collectively help each of them to a new house with reasonable accommodation for animals and separation of the sexes. Our political conscience has reached a point at which it is allowed that civilisation may say, without suspicion of Socialism, "We will not allow the owner of a soul to die of hunger." Education is the present cry, and we want every educatable citizen educated, as a measure to sustain the nation in industrial competition with other nations. How can we hope to educate people who live in houses of this kind? I shall not be sorry when the public conscience reaches the further point—that every owner of a soul is entitled to Christian shelter and means of decency. The Congested Districts Board has made roads into districts hitherto inaccessible, and it has built some houses, but for want of funds it is not able to move with a very small fraction of the speed necessary for the work.

(*To be continued.*)

Engineering Notes.

A New Laboratory for Electrical Engineering.—In the basement of the Royal School of Art Needlework, now being completed at the corner of the Imperial Institute Road, is a new laboratory which, when completed, will give to the Central Technical College an up-to-date equipment for the teaching of electrical engineering, and will once again place the college in the foremost position among the higher technical schools in this country.

Institution of Civil Engineers.—At the ordinary meeting on Tuesday, the 3rd December, 1901, Mr. Charles Hawksley, president, in the chair, the monthly ballot resulted in the election of one Member—C. E. Allan (Belfast); forty-three Associate Members, namely: R. B. Addis, F.C.H. (Bombay); T. M. Aitken (London); W. R. Baldwin-Wiseman (London); C. B. Blackburn (Wolverhampton); R. W. A. Brewer (Glasgow); W. Broadbridge (Penang Straits Settlements); C. Brown (Bedlington); G. E. Clarke (Sheffield); W. L. Craig (Melbourne); W. H. Davis (London); E. Dodd (Birmingham); J. R. Elliott (Nottingham); G. Ellson (London); J. Foley (Carlisle); C. F. Franks (London); H. W. Hanbury (London); W. S. Harrison (Hong Kong); W. Jamieson (Liverpool); F. W. Jones (Derby); S. C. Jones (Swansea); J. R. Laing (Leith); G. C. Laurie (India); A. Leitch (Port Glasgow); A. E. Marrian (London); E. S. Martin (Calcutta); W. G. Morris (Dartford); A. H. Ough (Hong Kong); A. D. Pack-Beresford (Sheffield); F. J. Rodwell (Leeds); C. H. Rudge (Chester); L. Sikes (Harrogate); C. F. Slade (Melton Constable); J. McFall Smyth (Keighley); G. Stirling (Melton Constable); G. Stow (Shoreham); J. D. Stuart (London); G. Swayne (Guildford); E. A. Tarrant (London); O. V. Thomas (Dursley); C. K. Trubshaw (Derby); W. H. J. White (Cheltenham); A. Wyatt-Smith (Cape Colony); and G. F. Zimmer (London); and six Associates, namely: J. H. Armytage (London); R. M. Barklie, Brigadier-Gen., R.E. (Andover); B. E. D. Kilburn, M.A. (London); A. E. A. Maia (Rio de Janeiro); H. C. Travers, Lieut., R.G.A. (Jersey); J. Winn, Major, R.E. (Chatham).

Keystones.

A New Church at Shotton, Flintshire, is in course of erection.

The New Town Hall at Ilford was opened last week. The building has been erected at a cost of about £30,000.

Mr. S. Inskip Ladds, A.R.I.B.A., of 7, Doughty Street, W.C., has opened a branch office at Market Place, Huntingdon.

Mr. Alfred Waterhouse's Retirement.—It is stated that Mr. Alfred Waterhouse contemplates retiring from the Treasurership of the Royal Academy, (if, indeed, he has not already done so)—this on account of his health.

A New People's Hall for Shepherd's Bush is being erected in Olaf Street, Latimer Road, by the Nonconformist bodies in the district. The hall includes a number of club-rooms, and will cost £6,846, of which sum £1,910 has been paid for the site.

Mr. Norman Shaw, R.A., has sent in his resignation from the Academy, apparently with the intention of retiring after his long career and giving place to younger men—a most laudable action. Mr. Watts has for some years been an Honorary Retired Academician.

M. Alexander Léon has been chosen by the directors of the Beaux-Arts as the artist most fitted to carry out the ideas of the late Puvis de Chavannes in regard to the beautiful frescos of the Pantheon, which remain unfinished in consequence of that painter's untimely death. For fifteen years M. Léon was the intimate friend and devoted collaborator and disciple of the master, and his own decorations at Courbevoie serve to show that he is the right man in the right place.

A New Church at Loxwood has been erected. It is built of light bricks with stone dressings, tiled roof of darker hue, and simple interior. There is a tower with a spire of Sussex shingle. The cost of the building is approximately £2,500. The ground around it has not yet been laid out. One of the most interesting features is the retention of some ancient oak pews in use at the old church; these are at least 400 years old. The architect is Mr. Rowland Plumbe, F.R.I.B.A., of Fitzroy Square, London, and the builder Mr. Spooner, of Loxwood. The building is heated on the most modern principles, and lighted by lamps. The church is capable of holding 300 persons.

Views of London Buildings.—Messrs. Marion & Co., of 22 and 23, Soho Square, W., send us Nos. 9 and 10 of their series of illustrated booklets—"The Empire; Its Cities, Palaces and Buildings." Each contains sixteen half-tone reproductions, 10in. by 8in., admirably printed, accompanied by descriptive notes of the buildings. No. 9 shows "Famous Buildings of London," while No. 10 is devoted to St. Paul's Cathedral. Of the other numbers published, No. 1 deals with Westminster Abbey, No. 5 with Windsor Castle, No. 7 with the Houses of Parliament, and No. 8 with the Tower of London. The illustrations are from most excellent photographs and form a useful and highly interesting series. The price of each number is only 6d.

Architectural Association of Ireland.—At an ordinary general meeting of this Association held at Dublin on December 3rd (Mr. George F. Sheridan, presiding), two short papers were read. The first, by Mr. E. Bradbury (one of the hon. secretaries), dealt with Northamptonshire as a field for sketching and study for architects, in the course of which the lecturer described (and in some cases illustrated by sketches) a large number of churches and old houses in the villages and towns of Northamptonshire. In proposing a vote of thanks to the lecturer, Mr. F. G. Hicks suggested that it might be possible to arrange that a party made up of members of the Association should visit some of the places described during the ensuing summer, a proposal which met with considerable approval. Mr. T. E. Hudman gave a short lecture on "Architectural Odds and Ends," in which he described a few strange experiences he had had whilst on sketching trips, and also some interesting but very little known facts in connection with matters of an architectural nature.

All Saints' Church, Ladysmith, South Africa, is proposed to be enlarged by the addition of north and south transepts and extension of the chancel at a cost of £3,300.

Mr. Charles Villiers Wilson, architect, of 31, Saughall Road, Chester, died last week of heart disease. Mr. Wilson was about fifty years of age.

A Painted Sketch for a Ceiling, by Sir James Thornhill, representing an incident in the life of St. Francis, has been presented to the National Gallery by Mr. Charles W. Dopson, and is hung in Room XIX.

St. Mary's Church, Elloughton, has been re-opened after renovation and improvements. A new chancel screen of oak, elaborately carved and costing about £300, has been erected from designs by Mr. Temple Moore, of Westminster and Driffield.

New Cottage Homes for Beaminster.—Mr. Peter Meech, who is a native of Beaminster, Dorset, has communicated to the authorities of that town his intention to erect and endow a set of cottage homes. The benefaction is worth about £5,000.

Garden City Association.—The third annual report states that very satisfactory progress has been made by this Association, due almost entirely to the five months of active propaganda. The number of members on the books is at present 530, as compared with 325 last year, but the numerical growth is by no means representative of the increased strength of the Association, as the majority of those who have recently identified themselves with the movement are men and women of considerable influence and eminence.

The Tower of Yatton Church, Somerset, was re-dedicated recently. Some time ago the tower and some of the parapets were found to be in an unsafe state, and Mr. Detmar Blow, on behalf of the Society of Antiquaries, reported that the tower could be repaired and made as efficient as if rebuilt, but Mr. Edmund Buckle (diocesan architect) unfortunately reported strongly in favour of re-building, and this latter course was at length adopted, and the work has been carried out by Messrs. Merrick & Son, of Glastonbury, who have preserved as much of the original stone as possible.

The Cuckfield Rural District Council are erecting new offices in the Boltro Road, Haywards Heath. The building is to be faced with local red bricks, with Bath-stone and terra-cotta dressings. The accommodation comprises dwelling houses, on either wing, for the surveyor and manager of the Council's waterworks, with offices for these officials and also for the clerk and sanitary inspector on the ground floor. In the basement will be stores and a substantial strong-room. On the first floor will be a council-chamber and two committee-rooms. The building has been designed by Mr. A. R. Pannett, of Haywards Heath, and the contractor is Mr. Stephen Knight, of Cuckfield.

A.A. New Premises Fund.—The following are the latest additions to the Architectural Association New Premises Fund:—

	£	s.	d.
The Architectural Association	1,000	0	0
Basil Champneys	50	0	0
H. T. Hare	50	0	0
E. W. Mountford	50	0	0
Ernest George & Yeates	50	0	0
John Belcher, A.R.A.	25	0	0
Beresford Pite	20	0	0
E. Guy Dawber	12	12	0
R. S. Balfour	10	10	0
E. M. Gibbs	10	0	0
Francis Hooper	10	0	0
H. D. Searles-Wood	10	0	0
A. Paull	6	6	0
W. A. Forsyth	5	5	0
A. H. Hart	5	5	0
H. P. G. Maule	5	5	0
C. B. Bone	3	3	0
J. H. Squire	3	3	0
F. D. Clapham	2	2	0
W. H. Raffles	2	2	0
G. L. S. Sharp	2	2	0
H. Teather	1	1	0
E. F. Reynolds	1	1	0
A. O. Collard	1	1	0
P. J. Turner	1	1	0
Stanley Towse	1	1	0
	£1,338	0	0
Donations previously announced	1,684	0	0
Total	£3,022	0	0

Vulcanite Roofing.—We understand that the name of the makers of this roofing, which is referred to on p. 288 of our issue for December 4th, has been changed to Vulcanite, Ltd., 2A, New Union Street, E.C.

Notice to R.I.B.A. Members.—Mr. Arthur Evans having, for reasons of health, been obliged to postpone his paper on "The Palace of Knossos in Crete," the general meeting of the R.I.B.A. fixed for Monday, December 16th, will not take place.

A Memorial to Prince Christian Victor, eldest son of the Prince and Princess Christian, is proposed to be erected at Windsor on a site near the foot of the Hundred Steps leading from the main thoroughfare through the town into the upper wards of Windsor Castle. The statue has been entrusted for execution to Mr. Onslow Ford, R.A., and will be placed in a canopied niche designed by Mr. A. J. Nutt, architect and clerk of works at Windsor Castle. The total cost will be £1,200.

Applied Art.—At a meeting of the Associate section of the Edinburgh Architectural Association held on December 4th (Mr. J. Stuart Syme in the chair), Mr. John Ednie read a paper on "The Applied Art of To-day and Yesterday," in the course of which he referred to the great changes effected through the agency of William Morris. The suburban villa came in for strong condemnation, and a suggestion was made that a committee of competent artists should be empowered to act as censors to prevent the amenity of beautiful districts being ruined by the wholesale multiplication of such monstrosities.

The Ancient Font of Great Staughton Church, Hunts, has been restored to use after being buried for some thirty-five years. It has been mounted on a new base and five short shafts designed by Mr. S. Inskip Ladds, A.R.I.B.A., of Huntingdon and London and the work was executed by Mr. Wade, of St. Neots. At the same time the fine bells (five in number) have been quarter-turned and rehung by Messrs. Warner & Sons of London. The east end of Wistow Church, in the same county, is being underpinned by Mr. A. Pettit, of Godmanchester, under the superintendence of the same architect.

New Barracks for Salisbury Plain.—The Government are about to provide additional barracks on Salisbury Plain to accommodate eight battalions of infantry, and the contract for the work, which it is expected will entail a cost of about £1,000,000, has been given to Mr. Henry Lovatt, builder, of Wolverhampton. The barracks are to be erected at the foot of Clarendon Hill, and will run from east to west and extend a distance of a mile and a half. The buildings will include thirty-two double company blocks for men's quarters, canteens, sergeants' mess, band rooms, drill sheds, guard houses, and officers' and commanding officers' quarters. It will also be necessary to build a village to accommodate the large number of men required to be employed on the works, and the location for it will be Brimstone Bottom, between Tedworth and Ludgershall, about a mile and a half away. Two railway lines have been constructed by the War Department to carry the material from Tedworth station to the site of the new barracks. It is expected that the work will be commenced almost immediately.

The Glasgow Technical College Architectural Craftsmen's Society held a meeting last Friday, when a paper was read by Mr. C. Ernest Monro, vice-president, entitled "Hotel-Planning and Construction." The question of site aspect and prospect was discussed, and, following this, the position on plan and general treating of the various public rooms, illustrated. Among these the coffee-room was important, and should possibly have bay windows, ceiling of good height, say 14ft., the floor of parquetry, and musicians' gallery provided, if desired. The lounge should be situated conveniently to coffee-room. The drawing-room also should be ready of access from coffee-room and have good outlook. The lecturer recommended the use of double sashes to these rooms, as also to the reading- and writing-apartments, to ensure the exclusion of outside sounds. The matter of prospect was also to be considered in the bedrooms, as good outlook is desirable to these. The various other rooms including kitchen, servery and offices, with the sanitary treatment necessary, were each in turn dealt with.

"Berliner Kunst" is the title of a new art monthly published by Ernst Wasmuth, of Markgrafenstrasse, 35, Berlin. It is chiefly devoted to furniture and decoration, and, like its predecessor, the "Berliner Architekturwelt," deals solely with the work of modern Berlin artists.

The "Clamond" Gas Radiator, in which the well-known Kern incandescent gaslight burner system is adopted, has recently been the subject of a careful investigation by the "Lancet." They state that the heating efficiency of this radiator is very great, "and we doubt whether such an output of radiant heat has ever before been attained at so little cost and so low an expenditure of gas . . . the combustion of coal gas is complete, and without the production of those partly-burnt gases or escaping unburnt gases which are injurious to health. . . . . The results of this enquiry distinctly confirm what is claimed for the 'Clamond' gas radiator—it gives a cheerful, healthy, radiant heat, is remarkably economical, and, as far as our experiments have gone, shows no deteriorating effect upon the air." The makers of the radiator are Messrs. The Kern Burner Co., Ltd., Kern Buildings, Gravel Lane, Southwark Street, S.E.

COMING EVENTS.

Wednesday, December 11.

Society of Arts.—Prof. Ernest Wilson, M.I.E.E., on "Aluminium," 8 p.m.

Northern Architectural Association.—Mr. J. Miller Carr on "Terra Cotta, &c.," 7.30 p.m.

Society of Engineers.—Annual Dinner at Hotel Cecil, at 7 p.m.

Dante Society.—Prof. Hall Griffin on "Dante's City as seen by Browning," 8 p.m.

Institution of Civil Engineers.—Students' Visit to Messrs. Maple & Co.'s new Electrically-driven Cabinet Factory in Highgate Road, at 3 p.m.

Thursday, December 12.

Leeds and Yorkshire Architectural Society.—Rev. H. Armstrong Hall, M.A., on "Some Village Churches of North Devon," 6.30 p.m.

Manchester Society of Architects.—Mr. Halsey Ricardo on "Revival of Gothic Architecture."

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Sheffield Society of Architects and Surveyors.—Mr. A. Jeffery on "Stained Glass."

Royal Society.—Ordinary Meeting at 4 30 p.m.

Institution of Electrical Engineers.—Discussion on Prof. E. Wilson's paper on "The Physical Properties of Certain Aluminium, Alloys and some Notes on Aluminium Conductors." Mr. Arthur Wright on "Some Principles underlying the Profitable Sale of Electricity," 8 p.m.

Chemical Society.—Extraordinary General Meeting at 8 p m.

Trades Training School, Carpenters' Hall, London Wall.—Presentation of Prizes by Sir Michael Foster, K.C.B., F.R.S., 7.30 p m.

Friday, December 13.

Architectural Association.—Mr. J. E. Forbes on "Travelling Student's Notes," 7.30 p m.

Physical Society.—Meeting at 5 p.m.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne.—Council Meeting at 1 p.m. General Meeting at 2 p.m.

Saturday, December 14.

Institution of Junior Engineers.—Visit to the Croydon Combined Electric Light and Traction Works, 3.15 p.m.

Dundee Institute of Architecture.—Visit to Arbroath and Hospitalfield.

Monday, December 16.

Liverpool Architectural Society.—Mr. O. Brien on "Wood Staining and Veneering."

Tuesday, December 17.

Institution of Civil Engineers.—Discussion on Mr. Bryan Donkin's Paper on "Motive Power from Blast-Furnace Gases," 8 p.m.

National Registration of Plumbers: District Council for Cardiff, South Wales, and Monmouthshire.—Mr. E. B. Sawyer, R.P.C., on "The Plumber's Craft and the Registration Movement," 8 p.m.

Architectural Association of Ireland.—Mr. G. P. Sheridan on "A Holiday on the Continent," 7.45 p.m.

Wednesday, December 18.

London Chamber of Commerce.—Mr. R. Percy Sellon on "The Electrical Industry and Legislation," 2.30 p.m.

Geological Society of London.—Meeting at 8 p.m.

Edinburgh Architectural Association.—Bailie Mackenzie on "Ventilating and Heating," 8 p.m.

City of London College Science Society.—Prof. J. Logan Lobley on "The Haslemere Congress of the S.E. Union of Science Societies," 7.30 p.m.

Thursday, December 19.

London Institution.—Mr. W. St. Chad Boscawen, F.R.H.S., on "Recent Discoveries at Susa," at 6 p.m.

New Companies.

Bensons, Ltd.

Registered to acquire the business of a painter and decorator as now carried on by A. E. Benson, as Edward Benson & Son, at 10, Darlington Street, Wigan, Lancashire; and to carry on business as painters, decorators, electricians, shop fitters, builders, contractors, glaziers, carpenters, plumbers, gas, hot water and sanitary engineers, bellhangers and locksmiths, and agents for and dealers in general building decorating and furnishing requisites. Capital £2,500 in £1 shares. The first directors are A. E. Benson, A. H. Benson and C. Benson. Registered office: 10, Darlington Street, Wigan.

Indestructible Brick Syndicate, Ltd.

Registered to acquire from Baron de Barreto, of Brandon Park, Suffolk, the benefit of certain existing inventions relating to improvements in the production of bricks from a mixture of lime and sand; and to carry on the business of manufacturers and dealers in bricks, tiles, building blocks and building materials of all kinds; paviors, artificial stone manufacturers, &c. Capital £1,000 in £1 shares. The first directors are Baron de Barreto, G. H. Raw and J. S. Sheldrick. Registered office: 95, Gresham House, Old Broad Street, E.C.

Alfred Inman & Co., Ltd.

Registered to acquire the business now carried on at Stephenson Street and Landor Street, Birmingham, as A. Inman (late Bayliss & Inman), and to carry on business as rustic and rockery workers, builders, contractors, bricklayers, carpenters, masons, &c. Capital £1,500 in £1 shares. The first directors are A. Inman, W. Wright, J. H. Coy and W. Barnes. Registered office: Stephenson Street, Birmingham.

John Taylor, Ltd.

Registered to carry on business as painters, decorators, paperhangers, plumbers, glaziers, manufacturers of and dealers in paints, oils, colours, paperhangings, glass, lead and other painters' and decorators' materials, house furnishers, &c. Capital £5,000 in £10 shares. The first directors are H. Walker (chairman), W. B. Marshall and William Kermeth.

Taynton and Guiting Quarries, Ltd.

Registered to acquire the business of stone merchants, masons and quarrymen, as now carried on under the style of Groves Brothers, at Milton-under-Wychwood, Oxfordshire; and to carry on business as quarry masters, brickmakers, miners, and manufacturers of and dealers in, importers and exporters of, granite, marble, freestone, slate, concrete, cement and all classes of manufactured stones, &c. Capital £7,500 in £10 shares (250 preference). The first directors are A. W. Toy, T. Groves and E. G. Groves.

John Walker (Uttoxeter), Ltd.

Registered to acquire certain freehold property situate at Carter Street, Uttoxeter, Staffordshire; to acquire as a going concern the business of a timber merchant and cabinet maker as carried on at these premises; and generally to carry on business as timber merchants, cabinet makers, sawmill proprietors, timber growers, contractors, builders, slaters, plasterers, moulders, plumbers, painters, decorators, &c. Capital £5,000 in £1 shares. The first directors are Mrs. S. L. M. Barlow, Miss E. M. M. Walker and John R. M. Walker. Registered office: Carter Street, Uttoxeter, Staffordshire.

Yate Brick Co., Ltd.

Registered to acquire as a going concern the business of fireclay and brick and tile works, potteries and colliery owners, as heretofore carried on by the Yate Fireclay and Brick Co., Ltd., and generally to carry on business as colliery and mine owners, to deal in and with coal, cannel, iron, ironstone, clay, brick-earth, bricks, tiles, pipes, pottery, terra-cotta, &c. Capital £3,000 in £1 shares (1,500 preference). The first directors are B. Knowles and A. R, Knowles. Registered office: 43, Pipe Lane Bristol.

Surveying and Sanitary Notes.

Gift of a Public Park.—Mr. W. H. Lever, of Thornton Manor, Cheshire, has offered the Bolton Town Council, for the public use as a park, about 360 acres of land at Rivington, including the historic Rivington Pike, which has always been a great holiday resort of the people of Lancashire.

Threatened Suppression of a Footpath.—A proposal has been put before the St. Pancras Borough Council to close Bromwich Walk, Highgate, a footpath about 7ft. wide between Swain's Lane and the top of West Hill opposite the Grove, or which runs through the grounds of Holly Lodge; and the Works Committee of the Council have been instructed to negotiate with Mr. Burdett-Coutts, M.P., for an equivalent piece of land for the purpose of widening Swain's Lane, and for a site on the west side of Chester Road for housing purposes, to be conveyed to the Council.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CLUTTON (SOMERSET).—For the erection of a block of 10 cottages at Maynard Terrace, Clutton (being the first of five blocks), for the Greyfield Colliery Co., Ltd. Mr. W. F. Bird, C.E., architect, Midsomer Norton, Somerset. Quantities by the architect:—

A. E. Longden	£2,470	0
M. Dunford	2,450	0
Edward Walters	2,300	0
W. J. Bennett	2,150	0
W. J. & F. Chard	2,138	0
T. Hatherby	1,970	0
T. Keeling, Timsbury	1,750	0
Edwin Bryant, Bishop Sutton	1,674	0
C. Harvey	1,547	15
W. J. Heal,* High Littleton	1,490	0

* Accepted. [Rest of Bristol.]

HANLEY (STAFFS).—For the erection of a junior mixed school, for the Hanley School Board. Messrs. Scrivener & Sons, architects:—

Bennett Bros.	£2,720
J. Stringer	2,683
T. R. Yoxall	2,656
J. Bagnall	2,557
G. Ellis	2,500
Tompkinson & Gettelley	2,497
Cornes	2,475
T. Godwin*	2,415

* Accepted.

HARROW ON-THE-HILL.—For the construction of sewerage works, comprising the laying of 7-in. and 9-in. sewers, the building of manholes, flush tanks, ejector stations, foundations to engines, and seatings to boilers, together with other work appurtenant thereto, including patented machinery and plant to be supplied and erected by the licensed manufacturers, for the Harrow-on-the-Hill Urban District Council. Mr. J. Percy Bennetts, surveyor. Messrs. Shone & Ault, engineers, 47 Victoria Street, Westminster, S.W.:—

T. W. Pedrette, Clapton Common, London, N.W.	£9,433
E. W. Hollingsworth, Wealdstone	8,923
Meston & Hale, Harlesden	8,545
B. Cook & Co., Westminster, S.W.	8,483
J. & T. Binns, Croydon	8,404
Wimpey & Co., Hammersmith	8,254
J. Jackson, Plaistow	8,230
Wilkinson Bros., Finsbury Park	8,216
C. Ford,* Harlesden, N.W.	7,974
Lowes Patent Pipe Syndicate, Ltd. (special pipes)	7,425

* Accepted.

HOUNSLOW.—For the erection of 22 houses for the working classes, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, A.M.I.C.E., engineer and surveyor:—

Wallis & Co., Fulham	£6,620	9	8
Pitt, Mortlake	6,300	0	0
Soole & Son, Richmond	6,000	0	0
C. Emmett, Hounslow	5,983	15	0
Lock Bros., Sunbury	5,829	18	0
Barkers, Ltd., Kensington	5,575	0	0
A. Westbrook, Hounslow	5,373	18	3
J. Macklin, Hanwell	5,337	0	0
T. Hiscock, Hounslow	5,291	0	0
J. Christie, Shepherd's Bush	4,855	0	0
Beach & Co.,* Woodford	4,575	0	0

* Accepted.

LLANDRINDOD WELLS.—For the erection of two semi-detached houses in Llandrindod Wells. Mr. E. Peters Morris, architect, Llandrindod Wells:—

H. Gough, Dudley Road, Wolverhampton	£1,320
Weale & Lloyd, Knighton	1,214
R. E. Davies, Llandrindod Wells	1,078
H. Millward,* Llandrindod Wells	1,000

* Accepted.

LLANTRISANT (WALES).—For the supply of limestone metalling and limestone gravel at the various railway stations named in the schedule, for the Llantrisant and Llantwit Fardre Rural District Council. Mr. Gomer S. Morgan, surveyor, School Street, Pontyclun:—

Llantrisant Parish.

W. P. Powell & Co., Hirwain, near Aberdare	£2,350	16	8
T. Williams, Bute Quarries, Llantrisant	1,373	17	6
T. Williams,* Brofiskin Quarries, Pontyclun	1,326	1	6

Llantwit Fardre.

W. P. Powell & Co.	£2,111	4	2
T. Williams, Brofiskin Quarries	1,061	14	2
Rees & Edwards, Tynant Quarries, Pentyrch	1,041	2	6
T. Williams,* Bute Quarries	1,106	0	0

* Accepted.

LONDON.—For enlargement of Basnett Road School, for the London School Board. Mr. T. J. Bailey, architect:—

F. & H. F. Higgs	£3,190	General Builders, Ltd.	£3,031
Holloway Bros.	3,167	J. & C. Bowyer	2,954
H. Wall & Co.	3,165	E. P. Bulled & Co.	2,926
J. Garrett & Son	3,116	E. Triggs*	2,750
Lathey Bros.	3,087		

* Recommended for acceptance.

LONG EATON.—For the erection of a villa and stables, Sawley Road, Long Eaton, for Mr. William Beresford. Mr. Reginald Smith, architect:—

John Bull	£1,174
Geo. Youngman & Son	1,172
Brown & Son	1,110
Albert Martin	1,085
F. Perks & Son*	1,065

* Accepted.

LONDON.—For enlargement of St. John's Road School, for the London School Board. Mr. T. J. Bailey, architect:—

H. Wall & Co.	£3,414	Willmott & Sons	£2,839
Snewin Bros. & Co.	3,241	C. Cox	2,811
Treasure & Son	3,182	L. H. & R. Roberts	2,797
F. & F. J. Wood	2,966	W. Shurmur	2,790
C. Dearing & Son	2,932	McCormick & Sons	2,780
J. Grover & Son	2,920	Clarke & Bracey	2,752
W. King & Son	2,879	G. S. S. Williams & Son*	2,653
J. Simpson & Son	2,840		

* Recommended for acceptance.

MIDDLETON (LANCS.).—For paving, flagging, sewering, &c., Highfield Street, Haslam Street, Tudor Street, and Back Andrew Street, for the Corporation. Mr. W. Welburn, borough surveyor:—

J. Daltey, Rochdale	£2,382	14	5
T. Rowlands, Pendleton	2,165	15	0
Etheridge & Clarke, Manchester	2,054	17	7
French & Clough, Burnley	1,962	7	0
Snape & Son, Eccles, Manchester	1,960	19	3
A. Williamson, Blackpool	1,755	11	6
R. Heard, Middleton Junction	1,710	8	4
Cordwell, Wilson, & Lunt, Northwich	1,700	14	4
R. Partington & Son,* Middleton	1,663	15	4

* Accepted.

NEWBRIDGE, RUABON.—For minister's house and boundary walls, Newbridge Ruabon. Messrs. W. H. Johns & Sons, architects, Vroncysyllte, Llangollen:—

Evans & Roberts, Trevor, Llangollen	£654
E. Evans & Sons, Llangollen	618
Isaac Roberts, Llangollen	595
Price Williams, Overton-on-Dee	575
John Carden, Rhosymedre, Ruabon	545
Robert Hopley, Cefn, Ruabon	520
Jabez Higgins,* Oswestry	487

* Accepted.

WEST HAM.—For the erection of 36 double-tenement houses for the working classes in Invicta and Rendel Roads, Canning Town, E., for the Corporation of West Ham. Mr. John G. Morley, borough engineer:—

Spencer, Santo, & Co., Earl Street, Westminster	£21,000	0	0
Calnan & Son, 242A Commercial Road, E.	20,063	0	0
W. Irwin, 303 Essex Road, Islington	19,215	18	11
H. L. Holloway, Church Street, Deptford	18,370	0	0
Martin, Wells, & Co., 25 Auckland Street, Vauxhall	17,999	0	0
W. E. Davey, Burdett Avenue, Southend	17,275	0	0
Hardy Bros., Green Lane, Palmers Green, N.	16,565	0	0
J. Shelbourne & Co., 70 Fenchurch Street, E.C.	16,542	0	0
Gregar & Son, Jupp Road, Stratford	15,930	0	0
J. Barker & Co., Ltd., Kensington, W.	15,826	0	0
A. T. Haines & Co., Manor Road, West Ham	14,656	0	0
Herbert Bros., Corporation Street, West Ham	14,247	0	0
G. Wise,* works manager, West Ham	13,955	0	0

* Accepted.

WOMBWELL (near BARNSLEY).—For the erection of a new church and schools, &c., at Wombwell, near Barnsley, for the Primitive Methodist Connexion. Mr. J. P. Earle, M.S.A., architect, Norfolk Chambers, Norfolk Row, Sheffield:—

J. Fidler, Sheffield	£5,000
C. Broadbent, Wombwell	4,899
M. Grantham, Sheffield	4,708
Taylor & Sons,* Barnsley	4,698
J. Bishop, Rotherham	4,681

* Accepted.

CURRENT MARKET PRICES.

OILS AND PAINTS.

Castor Oil, French	per cwt.	1	7	0	1	8	7
Colza Oil, English	do.	1	7	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	7	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels	do	1	10	9	1	11	0
Petroleum, American	per gal.	0	0	7	0	0	7¼
Do. Russian	do.	0	0	6⅜	0	0	6¾
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	6	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	10	0	1	11	0
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	7	0	1	7	3

METALS.

Copper, sheet, strong	per ton	80	0	0		—	
Iron, Staffs., bar	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	2	6	11	12	6
Lead, pig, Soft Foreign	do.	10	17	6		—	
Do. do. English common brands	do.	11	7	6		—	
Do. sheet, English 3lb per sq. ft. and upwards	do.	14	0	0		—	
Do. pipe	do.	14	10	0		—	
Nails, cut clasp, 3in. to 6in.	do.	6	15	0		—	
Do. floor brads	do.	9	10	0		—	
Steel, Staffs., Girders and Angles	per ton	6	0	0	6	5	0
Do. Do. Mild bars	do.	6	15	0	7	5	0
Tin, Foreign	do.	112	15	0	113	5	0
Do. English ingots	do.	116	0	0	116	10	0
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	7	6	16	17	6

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec, Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	10
Do. Petersburg	per bundle	0	0	9	0	0	0½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	0	0		—	
Do. do. 2nd "	do.	12	10	0		—	
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st	do.	27	5	0		—	
Do. do. 2nd	do.	12	15	10	13	0	0
Do. do. 3rd &c.	do.	9	10	0		—	
Do. Canadian Spruce, 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	7	15	0	9	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	5	10	6	11	5	0
Flooring Boards 1in. prepared, 1st	per square	0	11	3		—	
Do. 2nd	do.	0	10	9		—	
Do. 3rd &c.	do.	0	9	3		—	

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a few of our readers who have not availed themselves of the advantages of

Our Insurance Schemes,

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(3.) It is sufficient for us to have an intimation from the newsagent that he supplies copies regularly.

(4.) Policies can be issued either direct to the subscriber or through the newsagent, whichever may be preferred.

(5.) In applying it is only necessary to write a postcard, giving the full name and address of the newsagent from whom the copy is obtained.

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THE MANAGER, BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Dec. 12	Nottingham—Bricks, Lime, Cement, &c.	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
" 12	Huddersfield—Six Almshouses	———	J. Kirk & Sons, Architects, Huddersfield.
" 12	Threlkeld, Penrith—Wesleyan Chapel and Schools	———	J. F. Curwen, Architect, Highgate, Kendal.
" 12	Leicester—Bricks, &c.	Corporation	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.
" 12	Wandsworth, S.W.—Additions, &c., to Infirmary Kitchen.	Wandsworth and Clapham Union Guardians.	C. A. Sharp, 11 Old Queen Street, Queen Anne's Gate, S.W.
" 13	Winchfield—Alterations, &c., to Workhouse Infirmary	Union Guardians	H. T. Sugden, Architect, Eversley, Winchfield.
" 13	Rochdale—Farm Buildings	Union Guardians	T. Townend, jun., Architect, Fleece Street, Rochdale.
" 13	Hull—Cement, Lime, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
" 13	Dewsbury—Shed, &c.	———	Holtom & Fox, Architects, Corporation Street, Dewsbury.
" 14	Blackpool—One-Storey Frame Building	Cleansing Committee	Cleansing Superintendent, 21 Birley Street, Blackpool.
" 14	Churston Ferrers, Devon—Terrace of Three Dwelling-Houses.	T. B. Bolitho	W. F. Tollit, Architect, Totnes.
" 14	Goole—Engineering Shop	———	F. Chambers, 13 Barge Dockside, Goole.
" 14	Aberystwyth—House	R. G. Smith	G. T. Bassett, Architect, Aberystwyth.
" 14	Alnwick—School	———	J. W. Douglas, 40 Bondgate, Alnwick.
" 14	Kirkcaldy, Scotland—Electric Generating Station	Corporation	W. L. Mackindoe, Town Clerk, Kirkcaldy.
" 14	Cavenham Hall, Suffolk—Farm Buildings	A. B. H. Goldschmidt	P. M. Beaumont, Architect, Maldon, Essex.
" 14	Ulting, Essex—House	H. N. Falkner	P. M. Beaumont, Architect, Maldon, Essex.
" 14	Somercoates—Additions, &c., to Premises	S. T. Watson	G. W. Bird, Architect, Ripley, Derby.
" 14	Roscrea—Church and Lecture Hall	Methodist Church Trustees	G. F. Beckett, 97 Stephen's Green, S. Dublin.
" 14	Lisnaskea—Repair and Roofing of House	Co-operative Agricultural and Dairy Society, Ltd.	J. Doran, Secretary, Boardroom, Creamery, Lisnaskea.
" 16	Lurgan—Bank	Belfast Banking Co., Ltd.	V. Craig, 5 Lombard Street, Belfast.
" 16	Bulwell, Nottingham—Chapel, House, &c., at Cemetery	Corporation	F. B. Lewis, City Architect, Guildhall, Nottingham.
" 16	Hull—Pavilions and Alterations at Infirmary	Royal Infirmary Board	J. Watson, Surveyor, Cogan Chambers, Bowlalley Lane, Hull.
" 16	Macclesfield—Additions, &c., to Public Baths	Corporation	Borough Engineer, Town Hall, Macclesfield.
" 16	Sevenoaks—Isolation Hospital	Urban District Council	W. H. Ansell, 11 Great James Street, Bedford Row, W.C.
" 16	Torquay—Memorial Clock Tower	———	J. J. Matthews, Gas Office, Torquay.
" 16	Mytholmroyd—Three Houses, &c.	———	W. H. Cockcroft, Architect, West End, Hebden Bridge.
" 16	Cork—Addition to Christian Brothers' College	———	S. F. Hynes, 21 South Mall, Cork.
" 17	Bromley, Kent—Strong Rooms	Urban District Council	Surveyor, District Council Offices, Bromley, Kent.
" 17	Fleetwood, Lancs—Schools	School Board	T. G. Lamb, 26 Birley Street, Blackpool.
" 17	Hastings—Lift Station and Conveniences, &c.	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 17	Sutton, Surrey—Public Baths	Urban District Council	C. C. Smith Surveyor to Council, Municipal Buildings, Sutton.
" 17	Tywardreath, Cornwall—Schools	School Board	J. Cook, Clerk, Tywardreath, Par Station, Cornwall.
" 17	Gosberton, Lincs—Enlargement of Classroom	School Board	R. H. H. Hand, 6 Double Street, Spalding.
" 17	Penge—Alterations, &c., to House	———	Secretary, 76 Beckenham Road, Penge.
" 18	Great Stanmore, Middlesex—Isolation Hospital	Hendon Rural District Council	J. A. Webb, Surveyor, Great Stanmore.
" 18	Swinefleet, near Goole—Police Station	West Riding County Council	J. V. Edwards, County Surveyor, Wakefield.
" 18	Plumstead—Boundary Wall (550ft.)	Woolwich Union Guardians	J. O. Cook, 1A Eleanor Road, Woolwich.
" 18	Leeds—Engine Shed, Workshops, Offices, &c.	North Eastern Railway Company	W. Bell, Company's Architect, York.
" 19	Leeds—Showyard	Yorkshire Agricultural Society	J. Maughan, Secretary, Blake Street, York.
" 20	Manchester—Administrative Department, &c.	Joint Workhouse Committee	A. J. Murgatroyd, 23 Strutt Street, Manchester.
" 20	Ballinasloe—Wing to Diocesan College	Most Rev. Dr. Healy	W. H. Byrne, 20 Suffolk Street, Dublin.
" 20	Loughglynn—Church	Very Rev. Canon White	W. H. Byrne, 20 Suffolk Street, Dublin.
" 20	Walthamstow—Underground Convenience	Urban District Council	G. W. Holmes, Engineer to Council, Town Hall, Walthamstow.
" 21	Reading—Electric Power Station	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
" 23	Chatteris, Cambs—School	School Board	W. Wren, Mount Pleasant, Cambridge.
" 23	Southend-on-Sea—Forty Workmen's Houses	Corporation	A. Fidler, Borough Surveyor, Southend.
" 30	Erdington, Birmingham—Pavilions, Boiler House, &c.	Aston Union Guardians	J. North, Clerk, Union Offices, Vauxhall Road, Birmingham.
1902.			
Jan. 4	Leeds—Hospital Extension	Corporation	City Engineer, Municipal Buildings, Leeds.
No date.	Hereford—Rebuilding Inn	Tredegar and Hereford Brewery Co.	J. Taylor, Architect, Exchange Chambers, Hereford.
"	Larne, Island—Hotel	———	A. Gorton, 24 The Crescent, Morecambe.
"	Canterbury—Three Houses	Cathedral Dean and Chapter	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
"	Hove—Mansion	———	Clayton & Block, 152 North Street, Brighton.
"	Hull—Pulling-down and Re-building Public House	Moors' & Robson's Breweries, Ltd.	Freeman, Son & Gaskell, 11 Carr Lane, Hull.
"	Marple—National Schools	———	J. Hunt & Son, 4 Warren Street, Stockport.
	ENGINEERING:		
Dec. 12	London—Electric Light Wiring and Fittings	London County Council	Chief Engineer's Department, County Hall, Spring Gardens, S.W.
" 13	Chesterfield—Storage Reservoir	Rural District Council	R. F. Hartwright, Clerk, Union Offices, Chesterfield.
" 13	Bakewell, Derbyshire—Waterworks	Rural District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
" 13	Maidenhead—Electric Lighting Plant	Corporation	Burstall & Monkhouse, 14 Old Queen Street, Westminster, S.W.
" 14	Pontypridd—Electric Plant for Power Station	Urban District Council	R. P. Wilson, Engineer, Council Offices, Pontypridd.
" 14	Southampton—Electric Motors	Director-General of Ordnance Survey	Preece & Cardew, 8 Queen Anne's Gate, Westminster.
" 14	Longtown—Waterworks	Rural District Council	J. Little, Engineer, Viaduct Chambers, Carlisle.
" 14	Poole—Quay	Harbour Commissioners	H. F. J. Barnes, Architect, Towngate Street, Poole.
" 16	Sydney, New South Wales—Steel Truss over Hunter River.	———	Commissioner and Principal Engineer for Roads and Bridges Sydney, N.S.W.
" 16	Towcester—Water Supply Works	District Council	W. Whitton, Clerk, Towcester.
" 16	Ireland—Single Railway Line Viaduct over River Barrow.	Fishguard and Rosslare Railways and Harbours Co.	Sir B. Baker, 2 Queen Square Place, Queen Anne's Mansions, Westminster, S.W.
" 17	Bury, Lancs—Sewage-Disposal Works	Sewage Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
" 17	Rochdale—Goods Yard, Widening Bridge, &c.	Lancs. and Yorks. Railway Co.	Engineer, Hunt's Bank, Manchester.
" 17	Stourbridge—Three Purifiers, &c.	Gas Committee	W. North, Engineer, Gas Works, Stourbridge.
" 17	Entwistle, near Bolton—Widening Railway	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
" 17	Lewisham—Heating Apparatus	Algernon Road Congregational Church	Secretary, c/o Chapel-keeper, 8 Algernon Road, Lewisham.
" 17	Manchester—Subway for Electric Cables	Corporation	City Surveyor, Town Hall, Manchester.
" 18	Oban, Scotland—Dynamos, &c.	Corporation	Burstall & Monkhouse, 14 Old Queen Street, Westminster, S.W.
" 18	Amsterdam—Railway Bridges, Fittings, &c.	Netherlands Ministry of the Colonies	Commercial Department, Foreign Office, S.W.
" 18	Gijon, Spain—Crane	Port Committee of Works	Commercial Department, Foreign Office, S.W.
" 19	London, N.W.—Electric Fire Alarm System at Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 19	Axbridge, Somerset—Laying Water Pipes	Rural District Council	A. Powell, 3 Unity Street, College Green, Bristol.
" 19	Manchester—Steel Roof	Corporation Gas Department	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
" 20	Walthamstow—Underground Convenience	Urban District Council	G. W. Holmes, Engineer to Council, Town Hall, Walthamstow.
" 21	Tredegar—Corrugated Iron Hospital	Bedwellty Urban District Council	J. A. Shepard, Clerk, Town Hall, Tredegar.
" 24	Lanchester—Sinking Well	Union Guardians	R. J. Waites, Workhouse Master, Manchester.
" 28	Reading—Electrical Plant	Corporation	Borough Engineer, Town Hall, Reading.
" 31	Littleton, Middlesex—Bridge across River Ash	County Council	H. T. Wakelam, County Engineer, The Guildhall, Westminster.
" 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
1902.			
Jan. 1	Lower Egypt—Lock Gates for Ziftah Barrage Works	Inspector-General of Irrigation	Inspector-General of Irrigation, Lower Egypt.
" 3	Bakewell—Water Scheme	Rural District Council	Sterling & Swann, Engineers, Town Hall, Chapel-en-le-Frith.
" 6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
" 6	Nantwich, Cheshire—Electric Plant	Urban District Council	Under-Secretary for Public Works, Sydney.
" 7	Manchester—Laying Waterpipes from Thirlmere to Manchester.	Corporation	W. H. Trentham, 30 Victoria Street, Westminster, S.W.
" 8	Christiania—120 Ammunition Wagons	Norwegian Government	Artilleriets Værksteder, Fæstninger, Christiania.
" 10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	G. H. Hill & Sons, 3 Victoria Street, Westminster.
" 27	Madrid—Electric Tramway Concession	Spanish Ministry of Public Works	Commercial Department, Foreign Office, S.W.
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
Mar. 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
Dec. 12	Nottingham—Iron Castings, Ironmongery &c.	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
” 12	Birmingham—Cast-iron Pipes, Special Castings, &c.	Water Committee	E. A. Lees, 44 Broad Street, Birmingham.
” 12	Margate, Isle of Thanet—Cast-iron Mains	Gas Company	J. Dougall, Engineer to Company, The Dane, Margate.
” 12	Leicester—Iron, Ironwork, Ironmongery, &c.	Corporation	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.
” 12	London, E.C.—Railway Stores	Burma Railways Co.	Secretary, 76 Gresham House, Old Broad Street, E.C.
” 13	Hull—Iron and Steel, Castings. &c.	Corporation	A. E. White, City Engineer, Town Hall. Hull.
” 14	Trimdon Grange, Durham—Colliery Stores	——	Storekeeper, Trimdon Grange Colliery, Durham.
” 16	Stockholm—Steel Rails, Fishplates	Swedish State Railways	Commercial Department, Foreign Office, S.W.
” 16	Nottingham—Iron Hurdle Fencing	Corporation	F. B. Lewis, City Architect, Guildhall, Nottingham.
” 17	London, E.C.—Metals	Southern Mahratta Rly. Co., Ltd.	E. Z. Thornton, 46 Queen Anne's Gate, Westminster, S.W.
” 18	Amsterdam—Railway Stores, Bridges, &c	Netherlands Ministry of the Colonies	Commercial Department, Foreign Office, S.W.
” 18	Castleblayrey, Ireland—Three Enamelled Iron Baths	Guardians	B. Coyle, Clerk, Workhouse, Castleblayney.
” 18	Leeds—Iron and Steel Work in Engine Shed, &c.	North Eastern Railway Company	W. Bell, Company's Architect, York.
” 20	Glasgow—Steel Rails, &c.	Corporation	J. Young, 86 Renfield Street, Glasgow.
” 30	King's Lynn—Ironmongery Castings, &c.	Corporation	H. J. Weaver, Borough Engineer, King's Lynn.
	PAINTING AND PLUMBING:		
Dec. 12	Nottingham—Brushes, Plumbers' Work	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
” 12	Leicester—Oils, Paints, Varnish, &c.	Corporation	E. G. Mawbey, Borough Engineer, Town Hall, Leicester.
” 13	Hull—Paints, Oils, Brushes	Corporation	A. E. White, City Engineer, Town Hall, Hull.
” 14	London, S.E.—Sheet Lead, Pipes & Painters' Materials	Guy's Hospital	Superintendent, Guy's Hospital, S.E.
” 16	Leeds—Cleaning Down and Painting Corn Exchange	Corporation	City Engineer, Town Hall, Leeds.
” 20	Chartham Downs, near Canterbury—Painting and Decorating.	County Lunatic Asylum Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
	ROADS AND CARTAGE:		
Dec. 12	Nottingham—Materials	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
” 12	Londonderry—Paving Setts	Corporation	City Surveyor, Guildhall, Londonderry.
” 12	Leicester—Brushes, &c.	Corporation	Borough Surveyor, Town Hall, Leicester.
” 12	London, S.W.—Wheels, &c., to Fire Engine Carriages	London County Council	Department of Clerk of Council, County Hall, Spring Gardens, S.W.
” 12	Leicester—Granite	Corporation	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.
” 12	Ware, Herts—Improvement Works	Urban District Council	J. E. Smales, Surveyor, New Road, Ware.
” 13	Preston, Lancs—Paving, &c.	——	Borough Surveyer, Town Hall, Preston.
” 13	Hull—Cartage, Tar, Watering, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
” 14	London, S.E.—Sand, Ballast, and Rubbish Cartage	Guy's Hospital	Superintendent, Guy's Hospital, S.E.
” 14	Devonport—Street Works	Town Council	J. F. Burns, Borough Surveyor, Municipal Offices, Ker Street, Devonport.
” 14	Newcastle-on-Tyne—Stone	Northumberland County Council	City Surveyor, Moot Hall, Newcastle.
” 16	Eastbourne—Private Improvement Works	Highways and Drainage Committee	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
” 16	London, S.W.—Asphalt Roadway	Fulham Board of Guardians	A. S. Snell, 22 Southampton Buildings, W.C.
” 16	Romford—Broken Granite	Rural District Council	G. Lapwood, Highway Surveyor, North Street, Romford.
” 16	Hastings—Brooms and Brushes	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
” 17	Rochdale—Road	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
” 17	Walthamstow—Street Works	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
” 18	Hemel Hempstead—Road Works	——	W. R. Locke, Borough Surveyor, Town Hall, Hemel Hempstead.
” 23	Southend-on-Sea—Making-up Streets	Corporation	A. Fidler, Borough Surveyor, Southend-on-Sea.
” 23	Southend-on-Sea—Wood Paving Blocks, and Artificial Stone Paving Slabs.	Corporation	A. Fidler, Borough Surveyor, Southend-on-Sea.
	SANITARY:		
Dec. 12	Nottingham—Pipes, Scavenging Brushes, &c.	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
” 12	Southampton—Drainage, &c., at Public-house	Corporation	Borough Surveyor, Municipal Offices, Southampton.
” 13	Hull—Salt-Glazed Pipes, Scavenging, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
” 13	Devonport—Pipe Sewers, &c.	——	J. F. Burns, Borough Surveyor, Devonport.
” 14	Wantage, Berks—Sewerage & Sewage-Disposal Works	Urban District Council	Cameron, Conuwin & Martin, 7 & 8 Bedford Circus, Exeter.
” 16	East Preston, Sussex—Cast-iron Outfall Sewer	Union Guardians	J. Taylor, Sons & S. Crimp, 27 Great George Street, Westminster.
” 16	Sutton Coldfield—Pipe Sewer, &c.	Corporation	W. A. H. Clarry, Borough Surveyor, Town Hall, Sutton Coldfield.
” 16	London, N.—Sewers, &c.	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
” 17	Bury, Lancs—Sewage-Disposal Works	Sewage Committee	A. W. Bradley, Borough Surveyor, Bury, Lancs.
” 21	Mevagissey, Cornwall—Outfall Sewers, &c.	St. Austell Rural District Council	T. H. Andrew, 1, Trevarrick Villas, St. Anstell.
” 30	King's Lynn—Disinfectants, Stoneware Pipes, &c.	Corporation	H. J. Weaver, Borough Engineer, King's Lynn.
Jan. 6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
	TIMBER:		
Dec. 12	Nottingham—Timber	Corporation	A. Brown, City Engineer, Nottingham.
” 12	Leicester—Timber	Corporation	E. G. Mawbey, Borough Engineer, Town Hall, Leicester.
” 23	Southend-on-Sea—Wood Paving Blocks	Corporation	A. Fidler, Borough Surveyor, Southend-on-Sea.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 17	Tywardreath—Board Schools	——	J. Cook, Clerk to School Board, Tywardreath, Par Station, Cornwall.
” 20	Burslem, Staffs—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902.			
Jan. 1	Gillingham, Kent—Laying-out Recreation Ground	£20, £10 & £5.	F. C. Boucher, Clerk to U.D.C., Gardiner St., New Brompton, Kent.
” 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
” 15	Kirkcaldy—Elementary School (400 pupils)	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
” 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
” 31	Newport, Isle of Wight—Queen Victoria Memorial	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Leigh, Lancs—Infirmary or Cottage Hospital	£30, £20, £10.	J. H. Box, Hon. Sec., Infirmary Committee, Leigh, Lancs.
No date.	Gateshead—Board School	——	E. J. Harding, Clerk to School Board, Gateshead.

Masters and Men.

Perth Plasterers' Wages Reduced.—The master-plasterers of Perth reduced the men's wages from 8½d. per hour to 8d. on November 30th. The building trade in Perth at present is, on the whole, very quiet, and consequently the reduction was received by the men without opposition.

A Strike of County Council Workmen has taken place at the Horton Manor Asylum buildings. Nearly 200 workmen are affected. The cause of the strike is due to the objection which the bricklayers have to work in conjunction with the tilers.

The Master-Builders in the West Bromwich and surrounding Black Country districts gave an intimation to their operatives some time ago that, owing to the depressed condition of the trade, they found it necessary to ask for relief in the shape of a reduction in wages, and it was suggested that the men should concede a reduction of ½d. per hour. It is reported that the operatives have determined to refuse this, but some of the leading employers assert that they have not as yet had any official intimation of the decision of the men. It is not likely that any further action will be taken on either side before March or April next.

Trade and Craft.

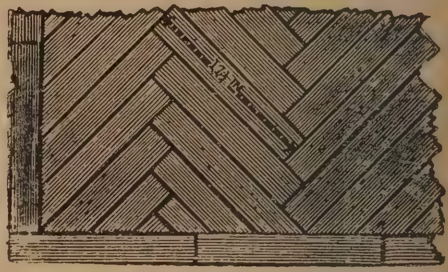
Ladders.

Ladders of all kinds are supplied by Messrs. Drew, Clark & Co., of 19, Waterloo Road, London, S.E. Extension ladders in two or three sections can be obtained from 8ft. 6in. to 36ft. long, while hinged or fixed double steps, tapering ladders, step ladders, braced back steps, builders' trestles, lattisteps, and folding trestle tables of various sizes are made by the firm.

Metallic Packing.

The Fairbanks Co., of 16, Great Eastern Street, London E.C., have placed on the market "The Merwarth Metallic Gasket," made in America. It is a metallic packing for steam and other pipes, and consists of a ring of lead wire enclosed by a piece of copper wire. When the flanges of the pipes are drawn together by screwing up the nuts, the lead is forced into every inequality and seals the joint, while the copper holds and preserves it. The joint will withstand the highest superheated steam-pressure, though it is certain that an electrolytic action would eventually be set up between the lead and the copper; the cost of renewal is, however, small.

FLOORING BLOCKS.



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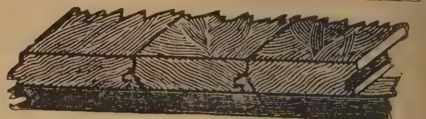

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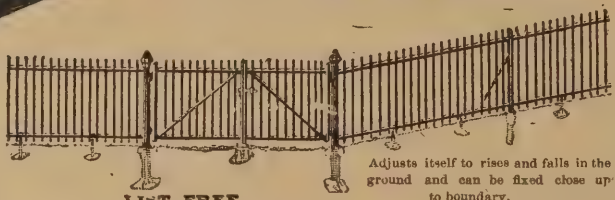

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DEC. 18, 1901.
NO. 358.

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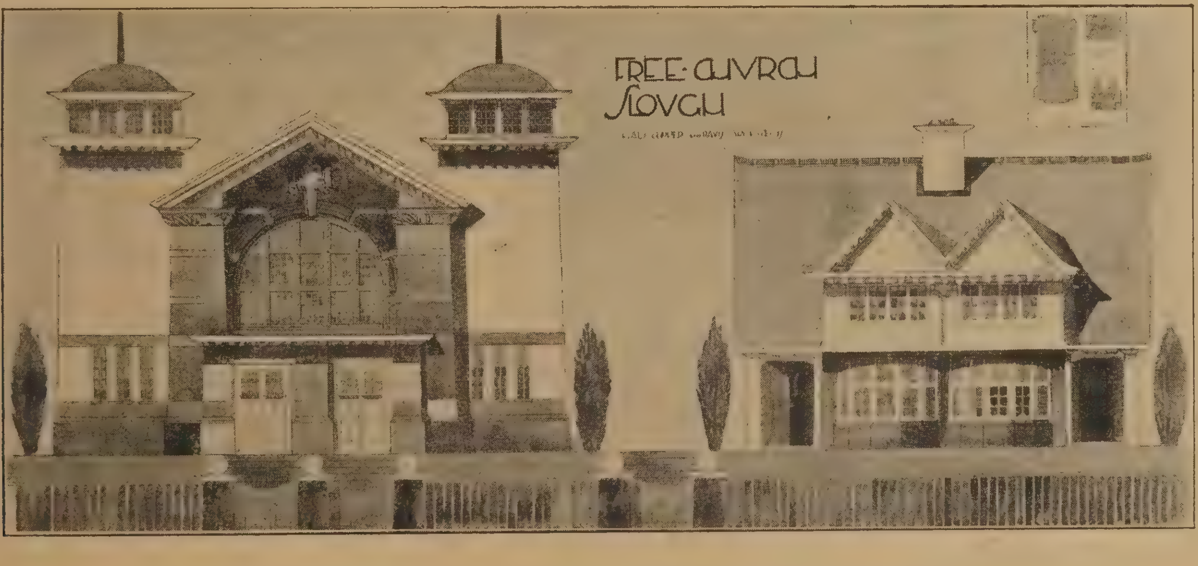
An Architectural Causerie.

O! The Public Taste. IT behoves everyone who produces a public commodity to examine the taste which creates the demand for it, or is influenced by it; and this more especially in regard to art and architecture. Our attention is re-drawn to this subject by the speech made by Mr. Augustine Birrell on Thursday last, when opening the exhibition of pictures by Scottish artists now on view at the Whitechapel Art Gallery. He pointed out that in the course of his career an artist (and, in a limited sense, an architect also) came to the time when he had to choose between painting in obedience to public taste or following the instincts of his own art. If he chose to paint to please the public, that was the moment when he was going to the devil. The public liked what was called a bad picture, because they were so horribly sentimental. The artist had only to put on the canvas some forlorn mother with tear-stained cheeks, bending over an empty cradle, and the public were done for. They wept, and, having wept, declared the picture to be a fine one, though the odds were it had no merit except the power to make them cry. Two hundred and fifty millions of people might prefer a coloured oleograph to one of Turner's landscapes, but they were wrong, quite wrong, even though their opinion were expressed by ballot.—Now these remarks by Mr. Birrell are eminently true of the public: and though one kind of art be deified by this critic and abused by that, though opinions on art differ more confusingly than in politics even (for there is never a cry, "What are politics?"), still, on certain grounds, all cultivated persons are agreed, just as, in architecture, the staunchest supporter of Gothic will admit the glory of the Parthenon and the most zealous advocate of Classic will revere the work of the Cathedral-builders; and all are surely agreed on the truth of Mr. Birrell's statements. Anyone with taste would condemn the prints for which the picture-dealer finds such a ready market, while the better work is bought by the few. It is, of course, in the more complex questions where art opinion divides. When Mr. Whistler affirms the maxim of "suggestion never depiction" he rouses many voices against him, just as when he asserts that a picture *is* a picture irrespective of what its morals (if any) may be. And it is here that the banalities of the public occur. In our own opinion, while we hold it quite possible to admire a picture simply for its colour or for its form, yet we cannot believe that an artist like Hogarth was prompted by no moral motives when executing his stupendous satires—we cannot think that they were nothing to him but a series of admirable drawings. The great thing in forming a judgment is to weigh both considerations; but the public do nothing of the sort—they see only the sentimental side, just as they will admire any building provided it is big enough and ornate enough. As for a hope of improvement, it is difficult to find one. But we certainly seem better off now than we were fifty years ago, and, maybe, the process of improvement is going on. It is the question of reform that sets one thinking, for the schemes (however admirable) of improving public taste which are discussed by the art and architectural societies are never heard of by the very persons for whom they are formulated, just as the ideas for improving the taste of the modern builder are either not known to him or pass unheeded. If you ask a builder why he covers his house with such tawdry ornament, he replies: "The public like it: it sells"—and as it is his living to build houses that will sell, it seems hardly fair to blame him; yet he should be blamed, because very often it is he that creates a bad taste among the public by erecting such commonplace houses, and not the public which is alleged to demand them. The public want cheap houses, not bad ones; and it is better to use good bricks and no ornament than bad bricks and bad ornament. But builders fail to see this.

Municipal Architecture. WE can always expect something strong (and probably sarcastic) from Mr. Reginald Blomfield, and he has maintained this reputation in the first of the two Warburton lectures which he delivered last week at Owens College, Manchester. He said that before about 1850 public buildings might have been unimaginative and dull, but the majority of them preserved some glimmerings of an architectural sense, whereas future generations would look with wonder and contempt on the mere barracks and masses of vulgarity that had too often done duty for our hospitals and our town halls. This caustic criticism sets forth generally Mr. Blomfield's views on the matter, but his particular contention was that, for good or ill, the municipal buildings of to-day represent the average public taste of the time, and it is not architects who are to blame, but the town and county councils who select them to do the work. Much as we are in accord with Mr. Blomfield's views, we can hardly accept this latter assertion, because we think that more often than not it is the inability of the architect which results in the unsatisfactory buildings in question. Money is spent freely on them both inside and out, but it is the design itself which is at fault. We are glad therefore to note that, in the latter portion of his lecture, Mr. Blomfield laid stress on the necessity for architects to receive a thorough technical training, and that before the student enters an office he should preferably have had some tuition at college or school. This, of course, is the system now established by the Architectural Association Day School, which, it is to be hoped, will be but the forerunner of many others throughout the country. London and Liverpool are the only cities in England where architectural education has been at all adequately recognised, but other towns also should provide such facilities—in the same way as technical institutions have been established, with inestimable benefit, throughout the length and breadth of the land. At Manchester it is intended to create a Chair of Architecture at Owens College when funds permit. We trust that this will soon be done; for it will be of a great help to the rising generation of architects in that district.



THE FREE CHURCH, SLOUGH. HALL, COOPER AND DAVIS, ARCHITECTS.

Free Church, Slough. THE materials used in this new church are brick, stone and rough-cast, the roofs being covered with green slates. Messrs. Hall, Cooper & Davis were the architects; and Mr. Joseph Seagrove, of Slough, was the contractor. The caps and shields are by Mr. A. Bernard Sykes, sculptor.

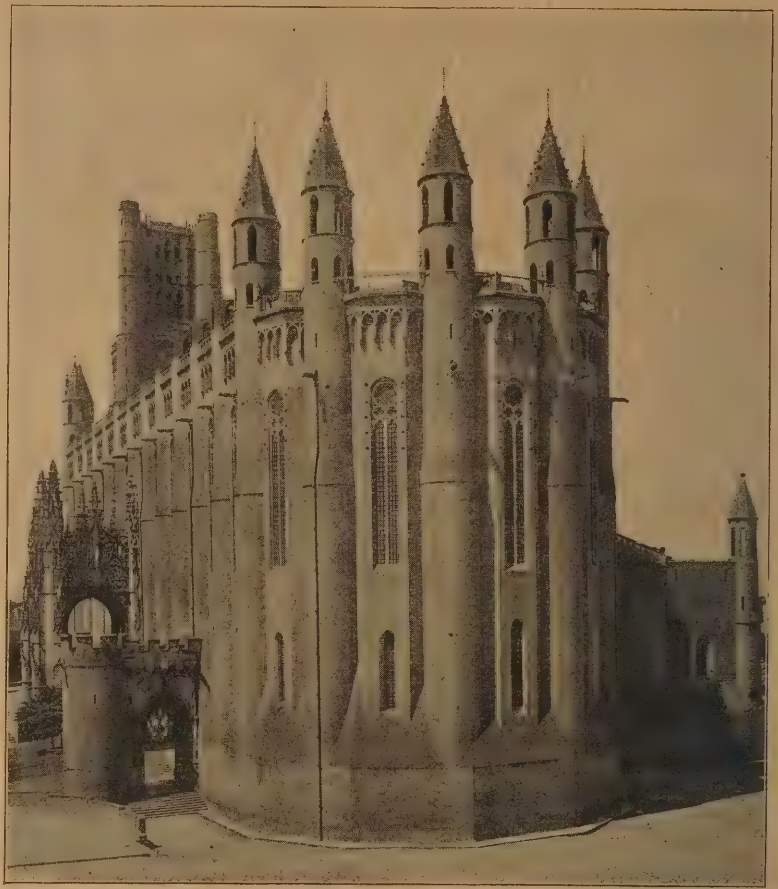
ALBI CATHEDRAL.

ALBI, the capital of the Tarn department in Southern France, though it is not fifty miles north of Toulouse, is not so often visited as it should be. The River Tarn flows quickly through it, and across the stream are several bridges, one being a structure which dates from the thirteenth and fourteenth centuries.

The cathedral was once a fortress and a church as well. It never could be mistaken for anything else. The church and the palace, with its adjoining buildings, form the southern and eastern sides of a large quadrangle. The north, with the fortifications, was towards the river. The west front of the cathedral, with its huge tower, partly occupied the other side. This tower is a mass of brickwork, like a great keep, rising in many stages with the angles formed by what might be considered four round donjons enveloping a high core which united them into one whole. From this group high walls of great thickness were built towards the river to meet those on the northern face.

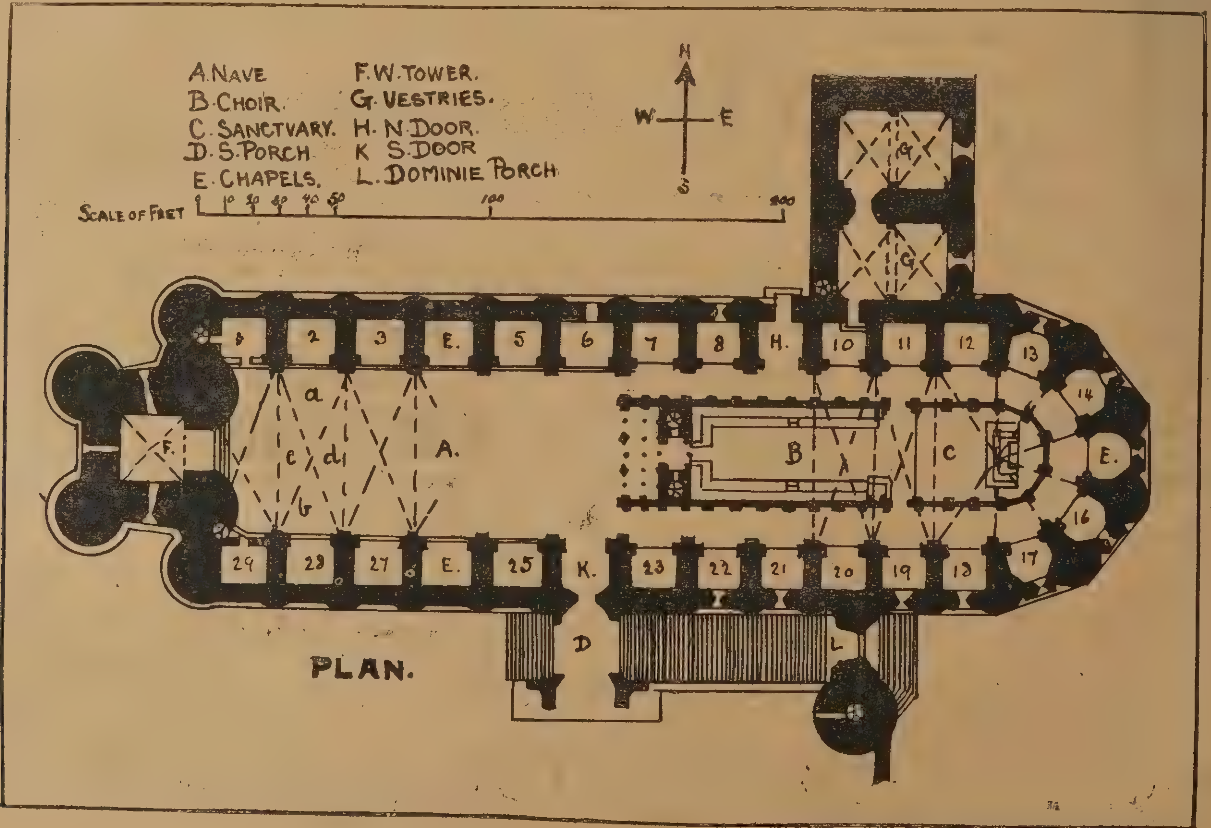
The eastern end of the church rises as a great single apse, showing buttresses of an unusual circular form, between which are the small apsidal terminations to the five chapels within. These diminutive apses only exhibit on their exteriors the long windows which pierce them in two ranges. They rise out of the long sloping finish by which a deep base to the whole mass recedes into and receives upon itself the bays of the apses and the curved forms of the buttresses. The great apse rises with a vertical face to the top. The only "set-offs," which are very slight, are made in the buttress cylinders of brick.

This strong mass is very impressive. The materials of which it is made help this effect, for the small bricks with the long white lines of the wide jointing, running like the silver threads of an extensive web laid on a red field, break up the broad plain surfaces. The little human figures at the base become a scale by which to measure its size, as, buying and selling, they move about in the market-place.


ALBI CATHEDRAL FROM THE SOUTH-EAST.

To the south of this end is a kind of porch which now serves to unite the last relic of the southern fortifications to the church. This remnant is a round brick tower, which was built in the thirteenth century. It was originally one of a chain defending the wall which enclosed the great cloister, and within which was a cemetery, a treasury, the houses of the canons, the chapter-house, and other buildings connected with the service of the church. These have all disappeared. The porch, named after Dominic of Florence, who was Bishop of Albi about the end of the fourteenth century, was strongly fortified, because by it was the only approach to the one entrance on the south side. There were two smaller doorways into the cathedral on the north, but, being protected by the palace and fortifications, they needed no such defence as this.

This tower, now forming part of the smaller southern gateway or porch near the east end, was once higher, but has been reduced to its present size by "restoration!" The veiling wall between it and the south side of the church had been much enriched by the prelate after

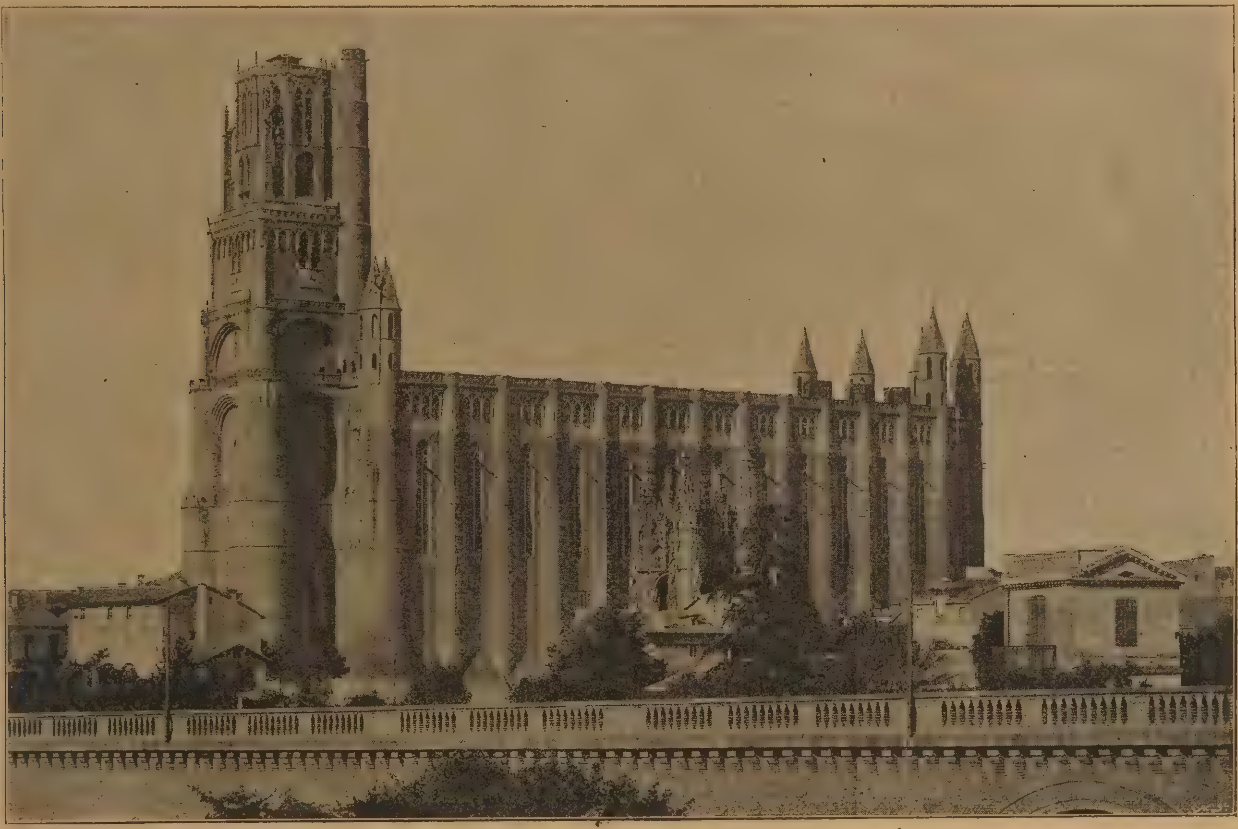


whom it was named. But nearly all the statues and reliefs were cut away by the vandals of the Revolution last-century. Now many of them have been restored or repaired, following the original idea and design devised from documents which remained.

Within this outwork fifty steps lead up to the great south portal, a Flamboyant structure standing on strong piers which support arches opening into it on three sides. The arch on the south was the one that used to lead into the cloisters; the western opened into a chapel, founded in 1521, now destroyed; and the northern formed the way into the nave.

The nave in this case really means the whole building. There had been a cathedral church in Albi in the ninth century. It remained until it was replaced by the present one, which was begun during the last quarter of the thirteenth century.

It has already been said that the church was part of a fortress. The great western tower, 256ft. high, was one of its most important points of defence. It was, no doubt, because of the uses this keep was to serve that there could be no entrance to the nave from the west.



ALBI CATHEDRAL FROM THE SOUTH.

The whole fabric is built of brick, with the exception only of the mullions and tracery of the windows, the porches, steps, some later portions of the west tower added during the fifteenth century, and the screen-work within the nave enclosing the choir and sanctuary, which was also a work of the same century. The foundations are a little more than 150ft. away from the river-level, and the walls as now "restored" rise 130ft. from the ground, but they were lower at an earlier date. These latter are 8ft. thick. The buttresses only appear on the exterior as slightly projecting curved portions of walling between the long windows, the sills of which are high out of reach from the ground. The real buttresses were, as the plan shows, inside the building, and between them were the chapels. These chapels stand 1ft. above the level of the nave floor, which is an uninterrupted span of 63ft. 6in. The whole width, adding the depth of the chapels, is 92ft. The internal length of this single vast nave is 300ft., and its height from the paving to the crown of the vault is 100ft.

The chapels are vaulted with diagonal ribs, and open into the nave by pointed arches. Above them, occupying the place of a clearstory and triforium combined, runs a gallery 14ft. wide, communicating completely round the interior except at the west. In this it was no doubt intended that the occupants of the fortification might still take refuge for further defence in case of necessity. They were well protected in such a position, as it could be reached only by very small and easily defended spiral staircases. The gallery is altered now in some details from its original condition.

The nave has twelve vaulted bays, counting from the west end, up to the transverse rib and buttress, where the apse begins its polygon of five sides, with an equivalent number of chapels. In the sixth bay from the west and on the south side is the principal entrance—a splendid feature under the great portal from without, and a truly glorious piece of design from inside the building. Westward, high up between the curved bases of the tower, is the great organ, with an interesting case. Beneath this, and painted upon the brickwork, are scenes of Life, and Death, and Judgment. Above all is the vaulting of the nave, with transverse and diagonal ribs dividing it into forty-seven compartments, with five more made by the vault of the apse. The whole vault is a most astounding work of colour-decoration. There is much to be found in Italy, much in France, in Germany, and in Belgium; but there is little painted decoration so impressive as this.

The twenty-nine chapels each still retain some of their original designs decorated in colour. Many have, unfortunately, been defaced. Further, there is that marvel of design and craftsmanship, the choir and sanctuary screen, and the rood loft, with their accompaniments. There is some fine glass of the fifteenth century still to be seen in a few fragments distributed among the windows.

The large painting on the barrel piers of the tower is the oldest, and one of the best, in the church. It is 50ft. high, and if the whole were still there it would represent one of the largest pictures to be seen. Though executed during the first decade of the fifteenth century, it is in a far better state of preservation than Michael Angelo's "Last Judgment" in the Sistine Chapel, where no pains have been spared to prevent decay. It was apparently painted directly upon the brickwork with so little preparation to receive it that the lines of the brick-jointing all show upon its surface. This does not in any way impair the effect of the whole, but rather improves it by giving a play to the surface.

The choir-screen was commenced about 1485–90, and has been described as the richest example of the kind in existence. The plan will show that it begins just eastward of the bay in which is the south door. There are three arches leading from the nave—one into the choir and the others to the side passages or ambulatories north and south. From these aisles are two other entrances to the central space between the sanctuary and choir. The northern of these still retains its old wooden door, which, like those opening into the nave, is a fine piece of design and craftsmanship. The south doorway was barricaded with boarding (as some "restoration" was still going on) in 1896, and the door itself had been removed.

Passing into the choir, there are, north and south, two doors giving access to the circular staircases leading to the gallery above. The space between them is vaulted, and in every direction is carving and tracery of the most lovely kind. Standing here under the arch, and facing east, the whole place is revealed.

The woodwork of the stalls is very plain in comparison with the masonry. The contrast is most valuable.

The altar now in the sanctuary is not the original one, and the paving, only lately finished, is also entirely new both in the choir and the sanctuary. The next things to notice are the sculptures of the Apostles and Prophets, which are still preserved upon the screen inside the choir and also outside in the ambulatory. These figures (which are 4ft. 6in. high) are all painted, but the colouring on the flesh parts is not realistic, and there is little, if any, attempt to imitate Nature.

There remains now the great vault of the nave, with its decoration. And it is upon this that the glory of the cathedral largely depends. But even this, if it did not cover so grand a field, could not be so impressive as it is. As a work of construction it is quite simple. The plain surfaces of the interior were of brick plastered to receive the colour. The ribs which support this

ALBI CATHEDRAL: THE DOMINIE GATE.

filling of the vault are stone, moulded very little. Transverse ribs divide the whole into twelve bays, and these are subdivided by diagonals into forty-seven compartments. Excepting ten compartments above the windows in the first, second, third, fifth and sixth bays, it has painted on it, besides the ground colour and the designs traced upon that, figurework of some kind with much variety of treatment.

The great vault is painted a blue almost as lovely in hue as the heavens. It is covered all over this ground, except where the figure groups occur, with designs in white, toned with grey. The ribs are now dull yellow; they once were brilliant lines of gold, between which are placed the pictured groups. The work, excepting the five compartments of the apse, has never been "restored." It is now as it was left by the Italian decorators who executed it between the years 1502 and 1512. The blue has lost none of its depth and purity, and all the colours are apparently as fresh now and as brilliant as they were 450 years ago. After some enquiry it was found that the blue used for colouring the vault had been obtained from carbonate of copper, or, in the language of chemical analysis, "from the precipitation of salts of copper by carbonate of potassium."

ARCHITECTURAL ASSOCIATION.

A MEETING of the Architectural Association was held on Friday evening at 9, Conduit Street, W., the chair being occupied by Mr. R. S. Balfour. After the minutes of the last meeting had been read and confirmed, Mr. Edward Cooper (Camden Square, N.W.) was elected a member of the Association.

Some "Notes on Oxford," by Mr. J. E. Forbes (A.A. Travelling Student, 1901), were then read by Mr. J. D. Tate, as Mr. Forbes himself was unable to be present. The author observed that so much had been written and said about the architecture of Oxford that it would be quite unnecessary for him to repeat facts which were so well known, and he therefore proposed to deal with his subject historically. The paper was illustrated by about fifty lantern slides.

A vote of thanks was proposed by Mr. N. F. Barwell, and seconded by Mr. W. J. H. Leverton. Mr. Balfour remarked that he was not quite in sympathy with the lines adopted by Mr. Forbes, who had been asked to give in this paper an account of his studentship. With regard to the remark that nothing new could be said about Oxford, he thought Mr. Forbes thus confessed himself unobservant, or so excessively modest as to deem that what he might say about the architecture would not be interesting to others. Yet he (Mr. Balfour) always thought that what one student could tell another was of great interest. He was therefore disappointed with the method adopted by Mr. Forbes.

In the course of the evening the chairman announced some additional donations to the New Premises Fund, as follows:—

	£	s.	d.
J. Alfred Gotch	31	10	0
A. W. Soames	25	0	0
E. T. Hall	20	0	0
B. T. Batsford	10	10	0
W. A. Pite	10	10	0
Executors of the late T. Satchell	10	10	0
Herbert A. Satchell	10	10	0
Capt. W. B. Marling	10	0	0
Arthur T. Bolton	10	0	0
Ronald P. Jones	10	0	0
C. J. Blomfield A. C. Blomfield	5	5	0
Hon. A. McGarel-Hogg	5	0	0
R. H. Weymouth	3	3	0
	161	18	0
Donations previously announced	3,021	19	0
Total	£3,183	17	0

A New Stained-Glass Window at Chipping Norton Parish Church is to be erected from a design by Mr. E. C. Kempe, of Nottingham Place, London, in substitution of the westernmost window in the south wall of the chancel.

MR. REGINALD BLOMFIELD ON MUNICIPAL ARCHITECTURE.

THE first of two lectures under the Warburton Trust was delivered on Wednesday last at Owens College, Manchester, by Mr. Reginald Blomfield, whose subject was "Municipal Bodies and Architecture." Mr. Alfred Hopkinson, principal of the College, presided.

Mr. Blomfield said he did not propose to offer any suggestions as to the practical business details with which municipal bodies were concerned in relation to architecture; a far more widely reaching question was the mental attitude of municipal bodies towards architecture, the faculty of judgment which they possessed—or did not possess—as representing the average public. He hoped to show that there was here a growing necessity for wider and more intelligent education, and to offer some suggestions as to the lines that this education should follow.

Municipal Buildings.

Municipal bodies in modern cities had more important functions to discharge in dealing with architecture than anybody else. The buildings for which they were responsible were public buildings, and therefore were, or should be, monumental in character, with regard to the fact that they were built once and for all, for certain special and permanent uses. For good or bad, they represented the average public taste and intelligence of the time. It was a reflection that should make the more thoughtful of our public men ponder on their misdoings—with some misgiving that future generations would look with wonder and contempt on the mere barracks and masses of vulgarity that had too often done duty for our hospitals and our town halls.

Unkind things were said about modern architecture, all tending to the conclusion that there was no such thing and that architects had nothing to say. This might or might not be the case, but it was not the fault of the architects. It was the fault of the bodies who employed them—bodies who too often took a very easy view of their responsibilities, and, considering architecture a matter of slight importance, cheerfully treated the selection of their architect as a matter of merely local and ephemeral interest.

The Attitude of the General Public.

The attitude of town and country councils to architecture but too faithfully reflected the attitude of the general public towards the art. That this attitude was quite unsatisfactory there could be no doubt. He thought that any competent observer who took note of the average of architecture in our great cities would be driven to the conclusion that the general level of taste and ability was low. He would find that some of the least admirable of these buildings were the most admired. He would find, too, no common standard of appreciation, but merely a mass of unrelated judgments, amounting to little more than individual expressions of like or dislike. He would, in short, find public opinion in architecture in a state very little removed from chaos. He would find that there was no intelligent body of opinion to which a competent architect could appeal as a matter of course; and that the public in the pursuit of architecture were like sheep without a shepherd. The uncertainty of taste shown in the treatment of the public buildings of the last fifty years was conclusive evidence of the confusion of judgment which existed in the minds of our representative public men. There was no reason in the nature of things why this state of chaos should indefinitely continue.

It had not always been so in English architecture. In the seventeenth and, still more, in the eighteenth century, when a building was to be erected such questions as had recently exercised the Liverpool Cathedral Committee did not exist. Architects who were called upon to design a building knew exactly what they had to do. They had no necessity to clear the ground by a long preliminary discussion as to the style to be adopted. But about 150 years ago a new element appeared. The amateur and the virtuoso assumed an importance which they had never previously enjoyed. Distinguished noblemen dabbled in design, and eminent men of letters amused themselves with architecture.

From Walpole to Ruskin.

Mr. Blomfield quoted the example of Horace Walpole, who, he said, subordinated architecture to the elegant insincerity of his own taste. When a direct attempt was being made to reproduce Gothic architecture, in obedience to a purely literary sentiment, it was hardly to be wondered at, he thought, that the layman should have lost his bearings.

Thus the nineteenth century opened with three styles struggling for ascendancy—the old traditional classic of Chambers and his school; the new Greek method, which was to be carried to such a high degree of excellence by Decimus Burton, and later by Thompson, of Glasgow; and, lastly, this revived Gothic. All architects of reputation followed one or the other of the first two manners. The amateurs stuck to the Gothic—and the amateurs carried the day; but when one considered that the whole force of the Romantic movement was behind them, the result was not surprising.

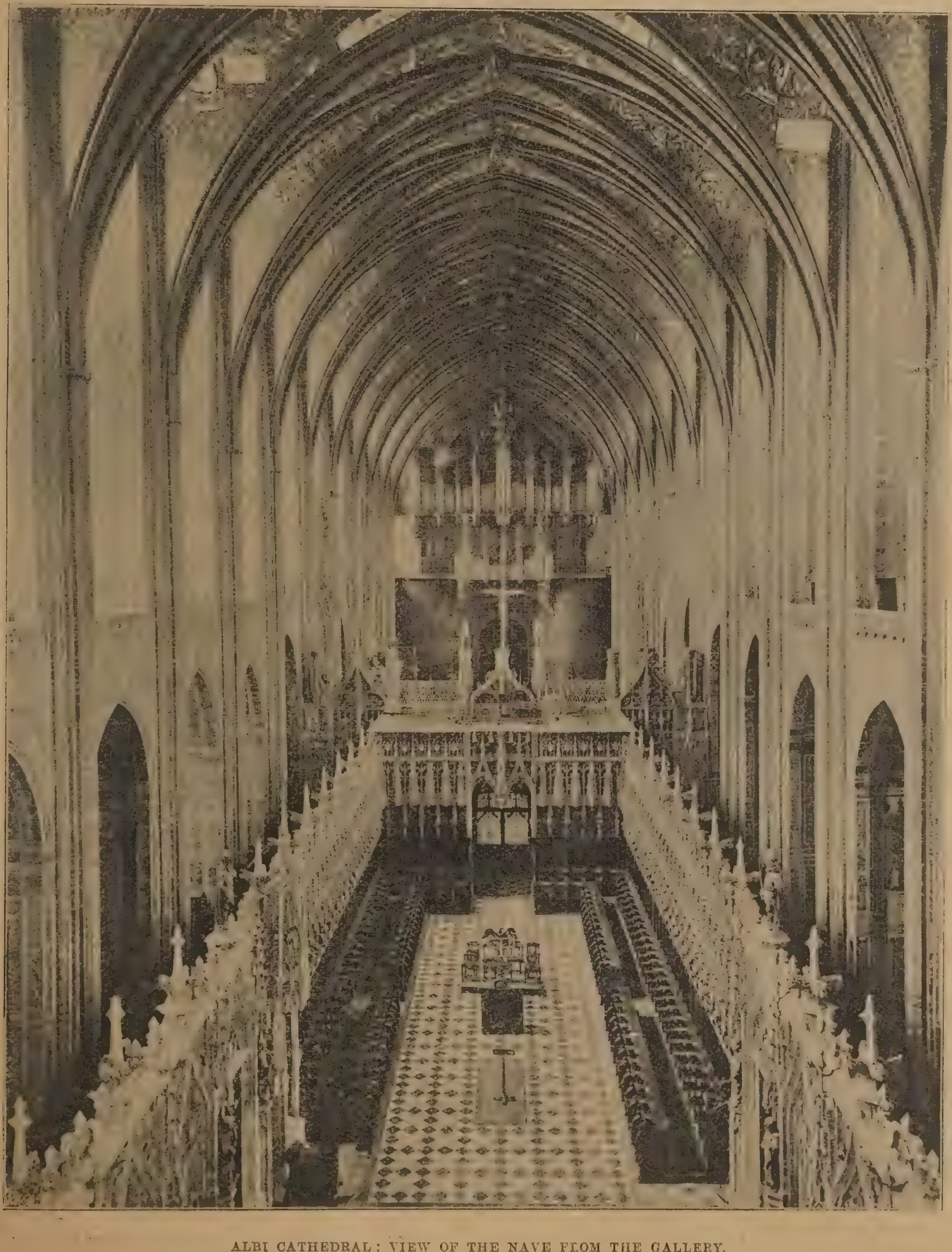
So Wyatt, or Wyattville, started his career of architectural murder; Pugin followed, and threw himself into the cause with the enthusiasm of an ill-regulated mind; and then came Ruskin, a man of narrow prejudice but brilliant genius, whose eloquence won a sort of St. Martin's summer for the Gothic movement, prolonging its life quite two generations behind the appointed time.

All these men, from Walpole to Ruskin, seemed to have laboured under one very serious vice in their handling of architecture. It never occurred to them that architecture was an art which dealt with practical and immediate necessities, that it was founded on use and based on construction, and that the details which so much exercised their attention—Walpole with his ridiculous Gothic, Ruskin with his exquisite sense of detail, and no more—were not architecture at all, but mere words or phrases in its language. So Walpole treated architecture as a subordinate expression of literature. Pugin, and still more Ruskin, translated it into terms of ethics. The result had been that the sense of architecture as an art, with its own limits, its own technique, and its own ideals, had almost disappeared, even among architects.

So far as the public was concerned, laymen had first of all lost their bearings in architecture, and finally had lost their interest in it, as being an art of no serious bearing on the immediate concerns of life, and therefore to be dealt with according to the fashion of the time, without regard either to first principles or to the teaching of the past. This habit of mind had been faithfully reflected in the conduct of the various bodies that represented the public.

The Effect of Public Competitions.

The history of public competitions for town halls and similar buildings erected in this country during the last fifty years was too painful to go into. But, with rare and brilliant exceptions, the deplorable results were to be seen in every part of England to this day—in asylums



ALBI CATHEDRAL: VIEW OF THE NAVE FROM THE GALLERY.

that disfigured a whole countryside with their deformities and town halls that brought their cities to shame. As for public parks and gardens, in these we had reached the lowest note of vulgarity ever sounded in our country. These fiascos in municipal architecture were a matter of the last fifty years or thereabouts. Before about 1850 public buildings might have been unimaginative and dull, but the majority of them preserved some glimmering of an architectural sense; they regarded proportion, and were not devoid of a certain staid dignity.

But this sort of thing would never do for the histrionics of the modern revivalist. He must have "something that knocks you down then and there"—something to be talked about, something that would reproduce well in the art papers. The absurd thing about it was that meanwhile there existed a high degree of individual good taste and culture. The difficulty was to get this knowledge into line and to make its weight felt in municipal dealings with architecture. We needed to instil sounder and simpler views into the man in the street, to make him more anxious and inquisitive about the buildings he had to live with, and to suggest to him larger ideas as to his duty in the matter. It was pretty certain that if the public wanted good architecture, and really cared about it to such an extent as to make it a matter of serious interest, they would very soon get it. He thought that there was no lack of ability among the architects of this country; the only thing was that ability did not appear to be wanted. If it were, public bodies would hardly tolerate what they got in some of their public buildings. London, for instance, or the London County Council, would hardly permit magnificent frontages in new streets to be taken up by financial syndicates and covered by piles of hideous buildings which made one long for a second Nero. Important public buildings would not be handed over to mere office draughtsman of unproved capacity; the care of our cathedrals and great public monuments would not again and again become what was more or less of a public scandal.

Education.

How were they to get at this state of indifferentism and to rouse municipalities and public bodies to a sense of their responsibilities? The question became one of education, and it was a question which, in a great and intelligent city like Manchester, should be seriously considered by its representative public men. Cities such as Manchester were not hampered by the traditions of the older universities; here, with a new foundation specifically designed to meet modern requirements, there could be no excuse for neglecting to provide for this growing educational need. There seemed to him, broadly speaking, to be three channels through which the public could be reached—(1) by direct school teaching; (2) by treatises on architecture; (3) by the work of architects themselves.

With regard to this last point, it must be obvious that in an art such as architecture, which must make its appeal through the eye, the object-lesson of a beautiful building was worth all the treatises in the world. But then, in the first place, the architect must be given the opportunity to design such buildings, and the public must have an eye to see them with when they were built.

Hitherto, and until quite recently, no systematic public education in architecture had been attempted in this country. It had remained outside the lines of general education, and from this point of view had been considered rather as a mere hobby for which no special provision need be made in educational schemes. It was for the modern universities to remedy this defect and to organise a system by which, at the great provincial centres, not only technical instruction for the student, but some reasonable education in the nature and history of architecture, should be provided for the public.

A More Exact Technical Training Wanted.

There was not only room but a growing necessity for more exact technical training in architecture. The old-fashioned system of articles, though not to be dispensed with, was not entirely satisfactory. His own opinion was that anyone who intended to become an architect should be put through a course of technical training as thorough as possible before he entered an architect's office at all. The means of such training should be provided at the great modern universities, and should include not only lectures but practical training in workshops and laboratories. Moreover, this training should not be confined to architectural students only. It was a well-known fact that the great majority of buildings erected in this country were not designed by architects at all; and it was also a fact that many contractors depended upon clerks and foremen for their practical knowledge. We should hear a good deal less of buildings tumbling down before they were up, of drains laid the wrong way, and the like, if all builders had to go through a course of good practical training. Moreover, the speculative builder might avoid some of his worst iniquities of taste if he had any—even the most rudimentary—acquaintance with what had actually been done in architecture.

After the technical training was completed, the work of course must become more or less educational: it was evident that some highly-trained controlling mind would be necessary to undertake this education in the art of architecture. Such a teacher would indeed have his work cut out for him, for it would be his business to clear the air of misconceptions and to lead not only students but the wider circle of an intelligent public to a sounder appreciation of the theory and function of architecture.

At this moment the public—that was to say, the average man—did not appreciate or understand architecture. In the first place, there was that old stumbling-block and rock of offence, the question of styles. It was evident from a recent controversy in regard to a great building enterprise that to the lay mind architecture presented itself as a question not of style but of a style. That was to say, he must be able to label it definitely Gothic or Classic or Greek or Egyptian or whatever else it might be. This meant that a design should present such a number of familiar features that it would be at once pigeon-holed as Gothic or Classic, because even the layman could see that it reproduced the mouldings and traceries, or the orders and entablatures, which he had learned from his text-book to be the distinctive features of the style in question. So the layman went his way quite satisfied. He thought that he had got his style according to his prescription, and fancied that he was building as good a Gothic cathedral or Classical temple as ever built in the days of Edward I. or Pericles.

Archæological Pedantry.

But he was not; he was only getting a more or less knowledgeable copy; he was getting not architecture but archæological pedantry; and the better it was the worse it was, because so far it divorced architecture more effectually than ever from the actual uses and necessities of the world we live in.

Such a professor as he had suggested would make it clear that these styles were merely the classifications of historians, often of amateurs; that they were merely labels of identification dealing with exteriors only, and that behind them there was an elusive spirit to be caught, the real meaning of architecture. It would be a great thing once and for all to clear away this initial misconception of architecture, but there were others hardly less formidable. The way out of the present welter was not easy. A century or more of experiment in the arts had brought little but disappointment and disillusion. Perhaps it was in this latter result that the hope for the future lay. Signs were not wanting of a half-articulate revolt against the two extremes of architectural disease, scholasticism on the one hand and commercialism on the other. We must learn to look upon architecture as a living art, not "complete and exhausted," as a distinguished critic made bold to say the other day, but with possibilities of development waiting to be found not less varied than in the happy days when architecture was a vital force.

A Chair of Architecture at Owens College.

Mr. Blomfield was thanked for his address on the motion of Mr. Alfred Darbyshire (president of the Manchester Society of Architects), seconded by Professor Tout. Professor Tout said that they hoped to found a chair of architecture at Owens College in the near future. It might be asked why there was not already such a chair in existence, but the reason was that the funds of the college were not adequate at the present moment for this new venture. If they could only get a little money to start with they would do their best to found the chair and to get the right man to fill it.

Mr. Blomfield, in responding to the vote of thanks, said the establishment of a school of architecture at Owens College would meet a very great need, and he wished Manchester all success in the enterprise.

Mr. Charles Rowley, chairman of the Manchester Municipal School of Art, says: "We have had conferences with the Owens College authorities and with the Manchester Society of Architects, and the Lord Mayor even went so far as to say that he would recommend the Corporation to aid by money grant the salary of a professor of architecture at Owens College. All this seems to have been ignored. We are taking the higher architectural teaching in quite as complete a form as we find it in Liverpool or in any of the Metropolitan and foreign architectural schools whose establishments and curriculum we have studied."

LONDON COUNTY COUNCIL.

AT last week's meeting of the Council Mr. Beechcroft asked the chairman of the Finance Committee whether he could afford any information with reference to the strike which took place at Horton Asylum, Epsom, about a month ago, in consequence of which a number of workmen were at present out of employment; and whether he could hold out any prospect of the dispute's being settled. Lord Welby said it was a fact that there had been a dispute at Epsom, resulting from a disagreement between the bricklayers and tilers. The Works Sub-committee had that day received a deputation from the trade-union on the subject. The whole question had been discussed, and the members of the deputation had promised to communicate with the Committee. He hoped that communication would be received in a day or two, but until it was received he could not give any idea of what the result of the conversation would be.—In regard to the view from Richmond Hill, Lord Monkswell said that an arrangement had been made with the owner of the Marble Hill Estate to extend the option of purchase for another six months, which would give them to the end of next June, simply on the terms of their continuing to pay interest at the rate of 4 per cent. up to the time the purchase was completed. There was, therefore, no need to feel apprehension as to their being driven in a corner at the end of the year.—It was agreed to adopt the underground system of electrical traction on further sections of the Council's lines south of the Thames.—After discussion it was decided to proceed with the Hampstead Road improvement, provided the St. Pancras Borough Council consented to the construction of tramway lines along Tottenham Court Road.—The Bill for the construction of a shallow underground tramway from the Victoria Embankment to Theobald's Road was approved.—It was agreed to contribute two-thirds of the cost of widening King's Road, Chelsea. Half the nett cost was ordered to be paid for the widening of a part of Brompton Road.—The Council approved the Water Purchase Bill.—Mr. R. Williams enquired whether the Corporate Property Committee had yet considered the application of an American syndicate to lease for building purposes a large portion of the proposed crescent site in the Strand. Mr. Hubbard (chairman of the Committee) said that the question had been referred to the valuer and the solicitor.—Replying to Mr. Verney, Colonel Rotton said he would have been delighted to have given any information with regard to a new county hall. So far as he could see, they would not get one during the lives of a good many of them; as they had not yet got a site.—The Finance Committee reported that the Westminster City Council applied for a loan of £24,000 for the alterations of the Town Hall, Charing Cross. Loans for three years, to be repaid by the sale of the disused Vestry Halls or other recoupments, were granted.

ORIENTAL EXPLORATION.

The Discoveries at Susa and other Buried Cities.

AS the season for the resumption of the work of exploration in the East is now drawing near, it may be worth while to notice some of the most important results of the work of the last two years. Foremost them among we have the work of M. de Morgan at Susa. The explorations conducted upon that site have restored not only a new chapter of history, but also revealed a prehistoric civilisation of no mean order. Of the two great tumuli of Susa, the larger was explored by Dieulafoy and found to contain the palaces of Darius and Artaxerxes, and the chief objects discovered now decorate the Susanian Rooms of the Louvre. M. de Morgan, however, worked in the smaller tumulus, and found the remains of two cities, the later of which was the Elamite capital destroyed in B.C. 640 by the Assyrians, and the second and lower town, of very primitive construction, resembling the oldest remains yet found in Babylonia, such as those in the lowest strata at Nippur, which may be assigned to a period not later than about B.C. 4500. The quantity of cinders and ashes indicated that the town had been destroyed by fire. Below this were no fewer than four successive settlements, so that we must assign an enormous antiquity to the oldest of these, which was found at a depth of 75ft. beneath the surface of the mound. The site was first a camp occupied only during the harvest. Then there grew up a small village or town, with wooden huts similar to those at Lacish, which was destroyed by fire. Then a more permanent town with walls, and a kind of fortress palace. Lastly came the Anzanian capital, destroyed in B.C. 640.

M. de Morgan has shown that the plain of the Dizful and Karun, as far as Mal-Amir, with its ancient caves and sculptures, is covered with mounds marking the sites of ancient cities and offering a fruitful field to coming explorations. The American work at Nippur has been continued by Dr. Hilprecht, and a new expedition under American auspices has commenced work at Nuwais, or Aboo Sharein, the site of the ancient Chaldean Sacred City of Eridu. The Germans are working in the mound of El-Kazar, "the palace," an immense hill of brickwork, which has been found to be the Palace in Nebuchadnezzar, in which Alexander the Great died. Lastly, the British Museum has despatched Mr. L. W. King to Babylon, and at length we are to see a British Expedition in the field.

ALBI CATHEDRAL : THE ORGAN.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Cement Tank.

Kingsbridge.—Querist writes: "I have a water tank to construct in the ground. I propose to make the floor of concrete 9in. thick; the roof of 5 by 3 steel joists 2ft. apart filled in with concrete, and the external walls of either 14in. brick in cement or 12in. concrete. The inside will be rendered with cement. All concrete to be composed of 4 broken stone, 2 of sand to 1 of Portland cement. Do you consider this satisfactory?"

The design is satisfactory. Concrete walls will be quite efficient if rendered inside with cement, but the surface must be finished with the trowel. The joints of the brickwork (if used) would need to be raked out to provide a sufficient key for the cement rendering.

Books on Perspective and Hydraulics.

Edinburgh.—Perspective writes: "Kindly name a book dealing with perspectives, and also one on hydraulic rams, &c."

R. Phené Spiers's "Architectural Drawing" (Cassell & Co., Ltd., price 10s. 6d.) and R. G. Blaine's "Hydraulic Machinery" (E. & F. N. Spon, Ltd., 14s.), or H. Robinson's "Hydraulic Power and Hydraulic Machinery" (Charles Griffin & Co., 34s.), will doubtless serve your purpose. There is also Mr. J. Wright Clarke's book on "Hydraulic Rams: Their Principles and Construction" (Batsford, price 2s.).

Book on Capitals.

London, W.—J. B. B. writes: "Kindly mention a good work on capitals."

We know of no book dealing exclusively with capitals.

Manholes and Sewers.

London, E.C.—X. writes: "What is the usual size and shape of a manhole to a 15in. sewer, 15ft. below the road, entered from the corner of the road? Can you refer me to a book that would assist me in specifying for a modern sewer about a quarter of a mile long?"

Manholes are usually about 2ft. square. "Sewerage and Sewage-Disposal," by Henry Robinson (E. & F. N. Spon, 12s. 6d.), or "Sanitary Engineering," by Francis Wood (Charles Griffin & Co.), will furnish you with the desired information.

Payment for Openings in Masonry.

Openings in Building writes: "I am erecting a new fan engine-house (rubble masonry) for a colliery company, the company finding materials. The tender and written contract both state "All openings under 8ft. to be measured in." Besides door and window openings, there are openings 2ft. and 5ft. wide for the fan, fly-wheel of engine, and other parts of machinery, to work in; also for the purpose of going down to the handholes to screw up the holding-down bolts. I had to give one price per cub. yd. for the whole of the masonry, and was told by the engineer that the work would be measured solid; and I based my price and put in the above words in my tender accordingly. Now a new engineer has been appointed, who refuses to measure and pay for the openings except those for doors and windows. (1) Am I entitled to have the other openings paid for or not? (2) Am I justified in stopping the work until the company pay for the openings? (3) Can I recover damages in consequence of the openings not having been paid for weekly?"

(1) Yes, certainly. (2) Yes. (3) You might be able to, but we should not advise you to fight an action at law for this. Your best method of procedure is to get your local solicitor to communicate with the company, demanding payment; the expense will be small, and the action probably effective.

Canvas for Temporary Buildings.

York.—Ebor writes: "Kindly name the chief firms who deal in canvas suitable for covering in the sides and roofs of temporary buildings for an exhibition."

The New Wire Wove Roofing Co., 75a, Queen Victoria Street, E.C.; London Patent Felt Co., 110, Cannon Street, E.C.; Willesden Paper and Canvas Works, Ltd., Willesden Junction, N.W.; Robert W. Blackwell & Co., Ltd. (makers of P. and B. Ruberoid Roofing), 59, City Road, London, E.C.

Liability for Builder's Mistake.

Bristol writes "To what extent is an architect liable for a builder's mistake? For example, a builder is under contract to build rooms of a certain height, figured on the sections, but he does not go high enough by one course of bricks. This is not found out by either builder or architect until the building is nearly completed. Can the builder be called upon to rectify the defect; and what position would builder and architect be in if the proprietor took over and occupied the building without having any change made?"

Builders often do this trick to save expense, but you are entitled to make the contractor remedy the defect, whatever work may be entailed, if you chose to insist upon it; but as the deviation from the plans is not very material you should get your client's consent to the alteration and make the builder recompense you both for the saving he has effected and for the damage to the design. If he refuses to recompense you, order him to alter the building according to the original plans.

Party Walls and the Rights of Adjoining Owners.

Croydon.—E. B. writes: "A client of mine has taken a new shop on a twenty-one years' lease. It appears that the adjoining owner on one side arranged to pay the cost of erecting the external wall of my client's shop and constituting it a party wall. He is now building on his site and has taken away the truss and pediment placed on the pilaster on the front of the wall, and he proposes to occupy this place with a portion of an arch which is out of keeping with my client's building. He also proposes to build his string-course partly in front of the glass fascia erected by my client. Consequently the total projection would be about 9in. from the centre of the party wall. Is he entitled to do this?"

I gather from your letter that the pilaster, truss and pediment, part of which has been removed, is jointly owned by your client and by the owner of the adjoining premises, who you state contributed towards the cost of its erection. You do not say whether or not any agreement was entered into between the parties at the time, and whether the adjoining owner agreed with your client not to remove or alter the party structure. I presume no such agreement was made. Such being the case, it is clear that (if the parties contributed in equal shares) the adjoining owner has a right to remove his portion of the structure when he pleases, so long as he does not injure the part belonging to your client. Also, in the absence of a special agreement to the contrary, the adjoining owner can erect any kind of building he likes on his plot, be it ever so much out of harmony with the design of your client's house; neither has your client any remedy against the owner of the freehold (from whom I presume he holds), save in the event of the freeholder having covenanted with him as to the class or design of buildings to be erected on the adjoining plot. In other words, your client has no remedy against either the freeholder or the adjoining owner, save in the event of a breach of an agreement by them. If the adjoining owner confines himself to removing or altering *his own* part of the structure, I am of opinion that he is entirely within his rights. From the plan which you send (not reproduced) it appears he has *not* so limited his operations. He has removed (apparently permanently) portion of the party structure, *i.e.*, the truss and pediment, and has erected or is about to erect in lieu thereof an arch, part of which will project laterally about 9in. from the centre of the party structure on to your client's premises, and the string-course will obscure portion of a glass fascia erected by the latter. In doing so he is undoubtedly committing a trespass and can be restrained by injunction. Damages can moreover be obtained against him. Notice should forthwith be served on him cautioning him against proceeding with the work under pain of legal proceedings. W. J-R.

Concrete Floors.

York.—E. M. writes: "If I make a concrete floor 10ft. sq., and embed in the concrete (below the neutral axis) tie rods of iron, equally distributed, very securely fixed at each end, but only going in one direction and not crossing each other, and the safe total tensile strain of the rods without elongation is 10 tons, would the safe distributed load the floor would carry be equal thereto, *i.e.*, 10 tons?"

The rods contribute to the strength in the direction of length in which they are placed, but give no transverse strength, which will depend on the thickness of the concrete. If, however, it is made about 7in. thick a 10ft. by 10ft. floor will bear a distributed load of more than 10 tons.

Churches in Kent and Surrey.

London, S.E.—Scotsman writes: "Kindly name some old buildings in Kent or Surrey, within easy cycling distance of East Dulwich, suitable to measure for the R.I.B.A. Intermediate Testimonies of Study."

Warlingham Church, Surrey (see an article on p. 163 of our issue for October 3rd, 1900), Eltham Palace, St. Mary Cray and Orpington Churches, Kent.

Preservative Solution against Dry Rot.

F. D. writes: "Some flooring and joists having been taken up because of dry rot, what is the best solution for covering the surrounding timber, which may possibly contain germs?"

Burnett's solution.

Claim for Defective House.

Berks.—House Owner writes: "Have I any redress on finding in a new house (within a few months' occupation) the joinery parting, doors painted white and enamelled over showing broad yellow streaks across them, rain driving through walls (hollow) under window-sill, roof leaking, drains untested? Is it obligatory to have a trap for a valve closet, and if one is not put in, is the builder or architect liable?"

If you have bought the house from a builder after examination, *i.e.*, in "market overt," you have no redress. If you have a guarantee, you can claim compensation. If an architect has been engaged to supervise, you can claim damages for his incompetence or failure to display reasonable skill and care, or fraud, but this would be difficult to prove, and we do not advise you to go to law. As to your other questions, there is no legal time that you can claim compensation in, unless there was a clause in the contract stipulating that the builder should keep the house in repair for so many years. Valve closets are insanitary, and are now seldom used; they need a trap; but we doubt if you have such a closet in the house. The necessary trap to every closet is usually attached, and can be easily got at, but traps are also required in the drain beneath; your enquiry is too indefinite to give a complete answer.

Liverpool Cathedral: A Petition Committee.—A committee has been formed to oppose the Bill which is proposed to be introduced in the next session of Parliament for the purchase of the St. James's Mount site. A firm of solicitors has been retained to advise them, and an arrangement has been made with the London City and Midland Bank to receive subscriptions at their head office in London or at any of their branches. Cheques should be made out to the credit of the treasurer, and paid into the credit of his account in Liverpool, and endorsed "Liverpool Cathedral Petition Account." For further particulars application should be made to the Secretary, Liverpool Cathedral Petition Committee, 6, Dale Street, Liverpool.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Architecture and Construction must be taught or practised simultaneously; Construction is the means, Architecture the result. Nevertheless, there are works of architecture which cannot be considered as construction, and certain constructions which can scarcely be ranked among architectural works. Some animals construct: these cells, those nests, others mounds, burrows, hovels, wicker-work—e.g., *woven twigs. This is certainly construction, but it is not architecture.*

VIOLLET-LE-DUC.

Our Plates. THE new technical schools being built by the Corporation of Barrow-in-Furness as a memorial of the late Queen Victoria's Diamond Jubilee are being pushed rapidly forward for early completion. The front of the building is faced with terra-cotta, after the designs of the architects, Messrs. Woodhouse & Willoughby, of Manchester, and the figure panels have been designed and modelled by the Burmantofts Works, Leeds, from particulars given by the architects. The central figure of the panel represents "Peace." The figure on the extreme left of the panel represents "Engraving." Another figure represents "Ceramics." "Painting" is next. On the extreme right is the figure representing "Sculpture." "Architecture," who is holding a small architectural model, is interested in the sculptor's work. The art of "Metal Work" is supported next to the central figure, with "Progress" and "Electricity," who is represented by "Shipbuilding" and "Mechanical Engineering." The figure on the extreme right represents "Mathematics." "Chemistry" and "Astronomy" stand next the central figure. The panels are situated on each side of the main entrance.

Crosses. THE movement for restoring the old crosses in churchyards and market-places appears to have received considerable impetus of late. In some cases—the majority perhaps—it takes the form of placing an entirely new cross on the old base; in others, where shaft and steps escaped destruction, it has only been necessary to provide a new head, while occasionally the mutilated capital itself has been unearthed, and the original monument has been deftly pieced together. In Devonshire recently the late High Sheriff, Sir Robert Harvey, has restored the churchyard cross at Harberton, the birthplace of Charles Kingsley. The late Canon Carter erected a handsome cross in the churchyard at Clewer; and Mr. G. E. Street, the architect, put one up as a memorial to his wife in a Surrey village. In London a churchyard cross has been erected at St. Mary, Haggerston; and Mr. H. C. Richards, M.P., has recently placed a fine Celtic Cross of Kilkenny marble in the old churchyard of St. John at Hackney to the memory of his parents. This cross is placed near the old tower of St. Augustine, on the west side of the churchyard, one of the very few detached belfries existing. At Inverness Sir Robert Finlay has restored the market cross, while that at Hastings is shortly to be revived. There is a fine old market cross at Chichester, which appears to be crumbling away.

Towneley Hall. THE Burnley Corporation has just purchased Towneley Hall, one of the most ancient family mansions in East Lancashire. Towneley Hall lies a little to the south of Burnley, although Whitaker believes that the original site of the mansion was a "tall and shapely knoll" rather to the south-west of the present structure. It has battlemented walls and protecting turrets, and is quadrangular in form. To-day only three sides of the quadrangle remain; the fourth side, which contained the gatehouse, domestic chapel and library, having suffered demolition in the time of Queen Anne. In some places the ancient portions of the walls are more than 6ft. thick. The most attractive part of the mansion is the domestic chapel near the great hall, and apart from this the building is a little inferior to most of the famous Lancashire halls. It is probable that the great hall in the mediæval days was an apartment of much magnificence, but early in the eighteenth century it was converted into an entrance hall, decorated in the Italian style. The present windows, which are Domestic Gothic in style, are contemporaneous with this alteration, but the original walls remain untouched, and the beautifully carved and ornamented door leading into the quadrangle still remains where it was placed in 1530. The chapel is supposed to date from about the middle of the fifteenth century. The entrance door to the chapel is well carved, and there is an entrance to a small priest's room on the north-west side.

The Parthenon. THE late Empress Elisabeth in 1895 saw, at an exhibition in Vienna, a plaster group by the Austrian sculptor Herr Schwezech, representing a reconstruction of the western end of the frieze of the Parthenon. Her Majesty was so pleased with the work that she gave Herr Schwezech an order for a similar group, representing the reconstruction of the eastern part of the frieze. Before the sculptor had finished a sketch of it the Empress died. He went on with his work, however, and finished the eastern frieze, satisfying himself by a visit to Athens and a careful study of the building that his reconstruction was in harmony with the original design of Phidias. Recently the Emperor Francis Joseph, who till then had been ignorant of the order given by the late Empress, inspected the model, which is on a scale of one-eighth, and expressed his great satisfaction with it. It was Herr Schwezech who modelled the statues of Cato and Lycurgus for the Austrian Houses of Parliament. He has also designed monumental works, but up the present has been little known outside his own profession. The work of strengthening the foundations and structure of the Parthenon has been making good progress. The King of the Hellenes frequently visits the Temple, and shows the keenest interest in what is being done for its preservation.

Cretan Exploration. THE revelation of a great palace on the site of Phæstus, in the south of Crete, by the Italian archæologists Halthew and Pernier last spring almost rivalled in interest Mr. Evans's discoveries at Knossos. News now comes that since the departure of the Italians for the autumn peasants have lighted on a series of rock tombs in the neighbourhood of the palace, evidently belonging to some generation of its lords. These tombs, which are both of the dome and chamber types, contained several skeletons apiece, richly adorned with gold objects, such as necklaces and rings, in which are set engraved gems representing cult-scenes, demons and other typical Mycenæan subjects. The discovery is of exceptional interest, since no tombs have hitherto been found pertaining to the great Cretan palaces, and it is only in tombs that the richer objects of the luxurious prehistoric civilization of the island are likely to be found.

Discoveries in Asia Minor. HERR DÖRPFELD, the Director of the German Archæological Institute at Athens, delivered an interesting lecture recently on the excavations at Pergamus, in Asia Minor, which are being carried on by German explorers. Herr Dörpfeld, who lately paid a visit to the spot, saw the foundations and a portion of the walls of an ancient Christian church which has been discovered in the market-place. The building has a large peristyle and a baptistery, and must have been erected before the destruction of other buildings in the market-place, which were demolished during the Roman dominion or under the early Byzantines, as it contains none of the stones belonging to them. The discovery of the church is especially interesting, as it is one of the seven mentioned in Revelations. Dr. Dörpfeld detected a marked resemblance between a water reservoir at Pergamus and the famous fountain of Kallirhce, near Athens, which he himself discovered.

Law Cases.

Baker Street and Waterloo Railway: Claim for Excavation Material.—The case of *John Shelbourne & Co.* v. *Perry & Co.* came before the Commercial Court last week. The plaintiffs sought to recover damages from the defendants (who were the contractors for the Baker Street and Waterloo Railway) for breach of a contract, dated June 5th, 1899, by which the plaintiffs were employed to cart away the surplus earth and other material excavated from the tunnel and shafts of the railway. Briefly, the dispute was as to whether the plaintiffs were entitled to the cartage of all the material excavated, or whether the defendants were at liberty to dispose of it in other ways. Mr. J. A. Hamilton, K.C., and Mr. Lochnis appeared for the plaintiffs; Mr. Scrutton, K.C., and Mr. C. Herbert Smith for the defendants. Mr. Justice Walton, in delivering judgment, said that no serious difficulty arose between the parties till September, 1900. It had originally been the intention of the defendants to do the work of tunnelling by driving tunnels north and south from a shaft on the river and north from the Piccadilly shaft. It was not at first intended to drive the tunnel from Piccadilly to the river, but the scheme was altered in March, 1898, and it was decided to drive the shaft between Piccadilly and the river, working at both ends. That was done, and in September, 1900, the two tunnels met. It then became possible for all the excavated rubbish to be removed by the river shaft, and it was less expensive to do so than to remove it at the Piccadilly shaft under the plaintiffs' contract; and accordingly some of the excavated material, which before the two tunnels met must have gone by Piccadilly, was removed by the river shaft. The result was that the plaintiffs did not get as much material to cart as before, and they wrote to the defendants complaining of this. After December 22nd, 1900, no further rubbish was removed at Piccadilly, and this action was then commenced. The plaintiffs' case was that they were entitled to do all the cartage for a certain section of the line, which section could be ascertained by reference to their letter of January 27th, 1898; and that that letter also specified the quantity—viz., 53,000 cub. yds. of earth—which they were entitled to have; and that that obligation of the defendants had not been fulfilled. On the other hand, the defendants said that they were only bound to give to the plaintiffs such excavated material as should in the course of working be removed from the two shafts in question. Now the contract itself did not define any particular part of the railway as being appropriated to the contract, nor did it say how much material was to be removed; it only said that the plaintiffs were to remove everything that came from the two shafts. It was said that the contract must be read with the letter of January 27th, 1898. The letter did no doubt contain a representation that there would be 53,000 cub. yds. to be removed at the Piccadilly shaft, but it was not suggested that that representation was made otherwise than honestly, and the letter did not, in his Lordship's opinion, impose any contractual obligation upon the defendants. The contract alone could be looked at to ascertain the extent of the defendants' obligations, and there was nothing in the contract binding the defendants to do the work in any particular manner, or giving the plaintiffs the right to have any particular quantity of material removed at the Piccadilly and Oxford Street shafts. The result was that the defendants had not committed a breach of the contract, and there would be judgment for them with costs.

A Leeds Obstruction of Light Case.—At the West Riding Assizes recently William Richardson, furniture dealer, sued the Overseers for the Poor of Leeds in respect of obstruction of light. The plaintiff occupies the basement and ground floor of premises in Park Lane, and at the back is the building occupied by the Leeds Overseers, with a frontage in South Parade. His Lordship wanted to know if the ground floor of the plaintiff's premises was above the level of the pavement. He was told this was so, and he thereupon commented that he had noticed this was a peculiarity of Leeds; the basement was improved by lifting up the ground floor. The defendants altered their premises, and the result was that the light derived from four windows in plaintiff's rooms was obstructed. He had now to burn gas continually, and the fumes rendered necessary more frequent renewal of paint and wallpaper and injured the polish on the furniture. Further, it was contended, plaintiff could not display his goods to the same advantage as before, and he thereby lost custom. An elaborate wooden model of the two buildings was produced showing the positions before and after the alterations.—Mr. John Hepper said that before the light was interfered with plaintiff's basement was worth 6s. 6d. per sq. yd. per annum, and the obstruction of light had depreciated it 1s. 6d. per yd., or £17 14s. per annum. The 292 sq. yds. of the first floor were worth 10s. per sq. yd., and he considered the depreciation was 2s. per yd., or £29 4s. per annum—a total of £46 18s. per annum. Plaintiff's lease had 7½ years to run, and the damage capitalised was put at £297 13s. 4d.—The jury found for plaintiff, and awarded him £120 damages. Judgment was given accordingly.

A Libel Action.—In the King's Bench Division of the High Court of Justice last week Messrs. A. B. Rathborne and J. E. Hill, stockbrokers, of 10, Moorgate Street, brought an action for libel against Mr. Harry Hems, of Exeter, claiming £500 damages. One of the plaintiffs instructed defendant to prepare a tombstone, and to erect it over the grave in the churchyard at Sutton-on-the-Hill, in Derbyshire, where his wife was buried. The cost was to be £48. Before concluding the work Mr. Hems requested an instalment of the cost, and when asked why he wished for the money in advance he sent a copy of a letter received from a trade protection society in which the plaintiffs were referred to in somewhat dubious terms—the inference being that they carried on an irregular and disreputable business, and that they were not members of the Stock Exchange, and were persons of no credit. The Lord Chief Justice said he was clearly of opinion that there was no case to go to the jury. The letter complained of was written in reply to one from Mr. Rathborne. Such reply was addressed to Mr. Rathborne personally, and he held that it was a privileged communication. Plaintiffs were accordingly non-suited.

MR. A. JEFFERY ON STAINED GLASS.

At a meeting of the Sheffield Society of Architects and Surveyors held last week, Mr. A. Jeffery delivered a lecture on "Stained Glass." He said that the first stained glass executed in England was in the time of King John. Previous to this all glass came from Italy, which even at this date boasted of eminent artists. The old masters taught us many lessons, and much could be learnt from them. We should try and embrace all the good qualities of the old men, ignore their shortcomings, and try to improve on what had been done before us. After the sixteenth century stained glass died out, and did not again revive until the nineteenth century. Mr. Jeffery went on to explain that a window should be part of a building, and should not be treated as a picture or wall decoration. If a man attempted a picture he spoiled his material as glass and made a very bad picture. The lecturer described the different methods of manufacture. He said that English glass was superior to foreign, both in material and workmanship. The most important point in a window, in his opinion, was permanency, and only the most permanent of colours should be used, at whatever cost. Speaking of domestic glass, he did not think the modern style was a passing fancy, but that it had come to stop, but like all other transitions in art at the outset it seemed to have been let loose, and we appeared to be seeking after something we could not quite grasp. But the style would ultimately settle down and find its own level. Mr. Jeffery, in conclusion, said he was eagerly looking forward to the time when there would not be so much commercialism in connection with artistic crafts, and he hoped architects in the near future would come more into contact with the craftsmen, and by their joint ideas succeed in raising the standar of work.

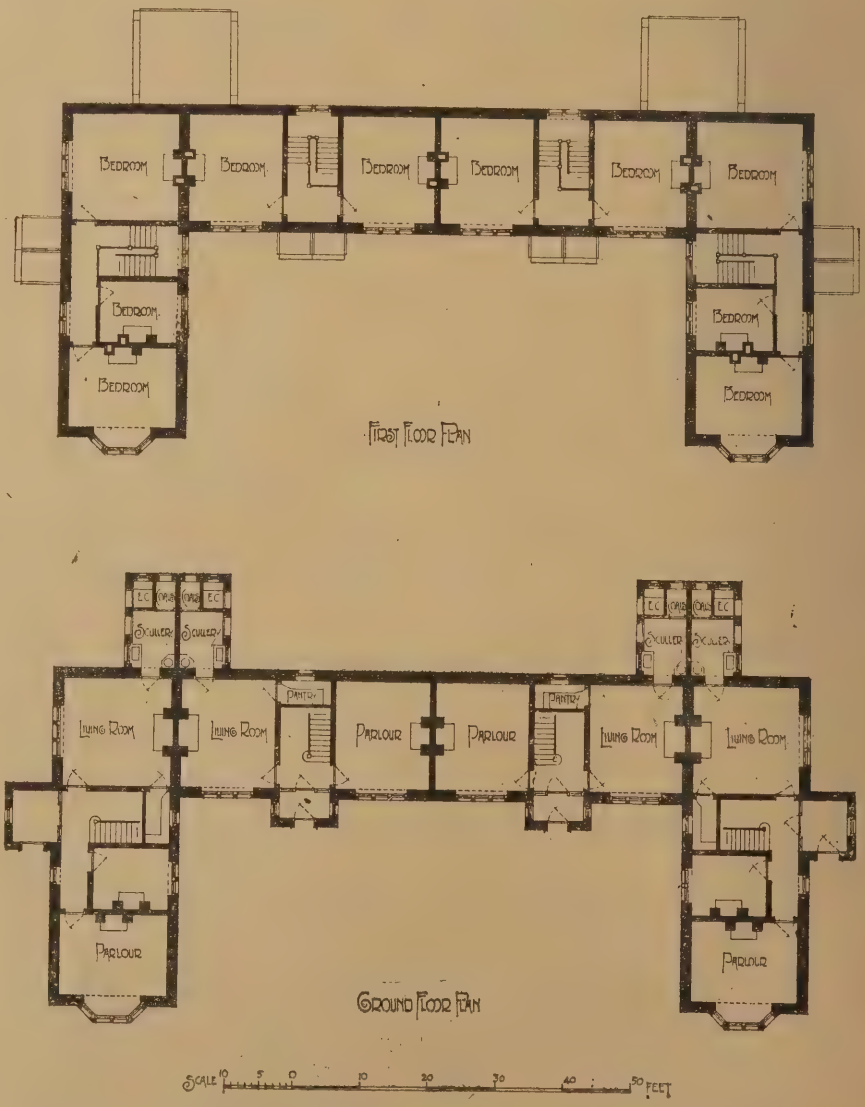
ABERDEEN'S NEW POORHOUSE.

A NEW poorhouse for Aberdeen is to be erected at Oldmill from plans prepared by Messrs. Brown & Watt, architects, Union Terrace, Aberdeen. Accommodation will be provided for 650 inmates, besides for the necessary staff, including nurses and other officers. The central building will be the poorhouse proper, and will contain also the general administrative department for the whole institution. The dining hall will form the central features in this block, and connected with it will be the kitchen and other accessories of the culinary department, including a large two-storeyed store. On the west side will be the wings providing accommodation for the different classes of male inmates, and on the east side will be the corresponding wings, with similar accommodation for the female inmates. Adjoining the female department will be the children's block. To the rear of the administrative department the boilers and laundry and wash-houses blocks will be situated, and connected with these will be the "stick" house and other labour departments for the male inmates. To the west of the main building, and retired a little further to the north, the general hospitals block has been provided for. A little further to the north is the site of the special hospitals. A nurses' home will be provided in a separate building. The porter's lodge is to be placed at the entrance to the avenue from the Skene Road, and immediately in the rear of this lodge will be placed the probationary wards, one for each sex, and each containing a day room and dormitory with ten beds. The site comprises about fifty-five acres of arable land, where the present buildings of Oldmill Reformatory now stand.

LEEDS SCHOOL OF ART.

THE new School of Art in Leeds is now being erected. The building will accommodate twice as many pupils as the old school, which, as a Government School of Design, was established in 1846.

The necessity of making better provision for the School of Art has been felt by the committee for some years. Last year they decided to invite competitive designs for a new building, the cost not to exceed £10,000, a substantial portion of which the committee hope to raise by means of donations. The design by Messrs Bedford & Kitson, of Leeds, was selected on the recommendation of the adjudicator, Mr. W. H. Bidlake, M.A., of Birmingham. The new building will have frontages in Vernon Street, Percival Street and Cookridge Street. In character the building will be quite plain, but on the west elevation, facing Cookridge Street, provision will be made for a panel, which will be filled in by the students in glass mosaic. In the basement provision will be made for classes in the applied arts, including plasterwork, repoussé, enamel, marble and stone carving, woodcarving and cabinet work, pottery, painting and decorating, lithography and bookbinding. On the ground floor there will be a light and shade class-room, a model and freehand class-room, and a lecture-room capable of seating 100 students. The first floor will afford accommodation for a painting class-room, an architectural class-room, a design-room and library, and an elementary modelling-room. On the second floor there will be the life-room antique-room, life-modelling room, master's room, and a conservatory for plants to be used in the school.



OFFICERS' COTTAGES AT THE NORTH-EASTERN REFORMATORY, NEAR MORPETH.
ARMSTRONG AND WRIGHT, ARCHITECTS.

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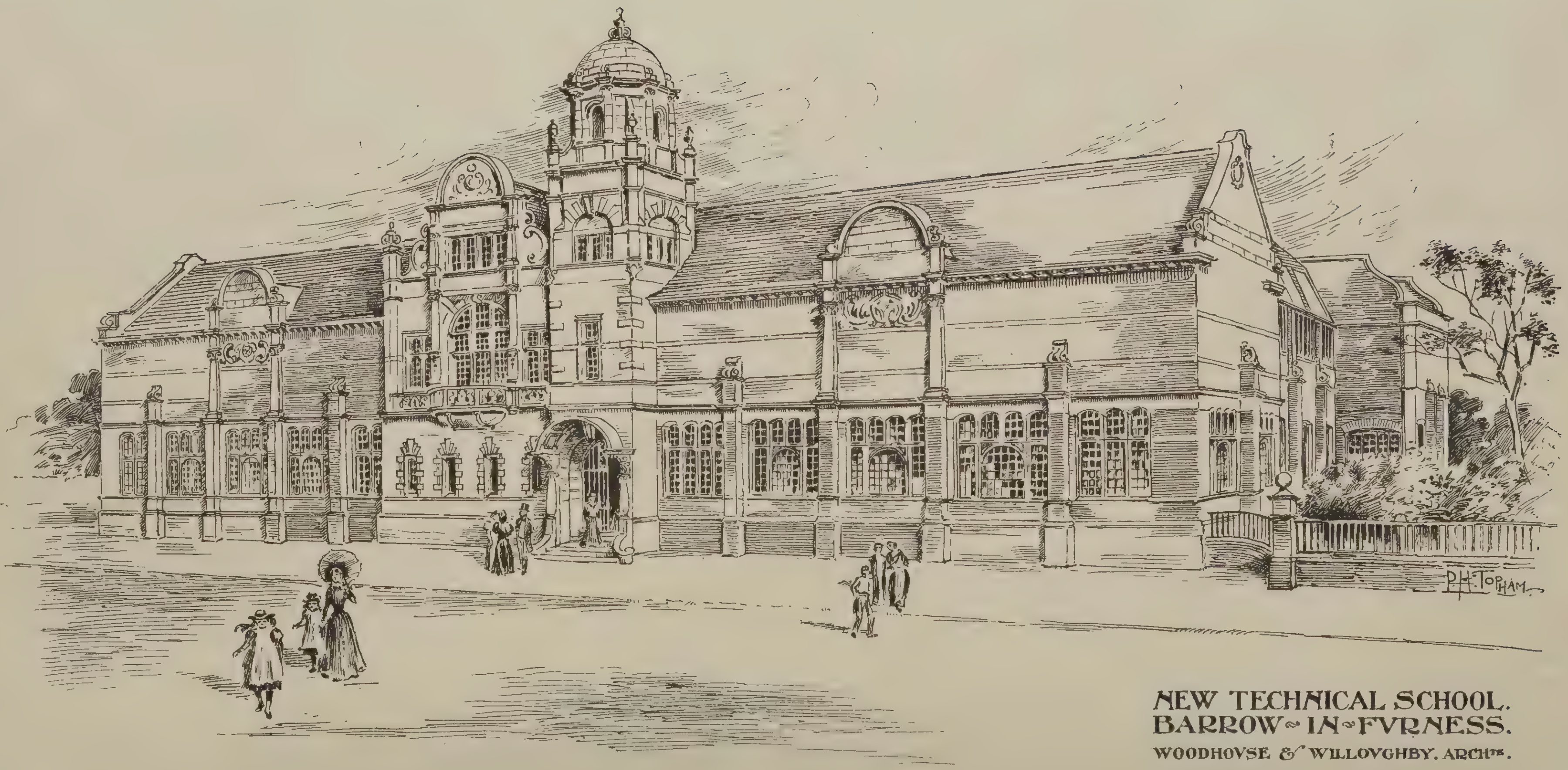

NEW TECHNICAL SCHOOL.
BARROW-IN-FURNESS.
WOODHOUSE & WILLOUGHBY, ARCHTS.

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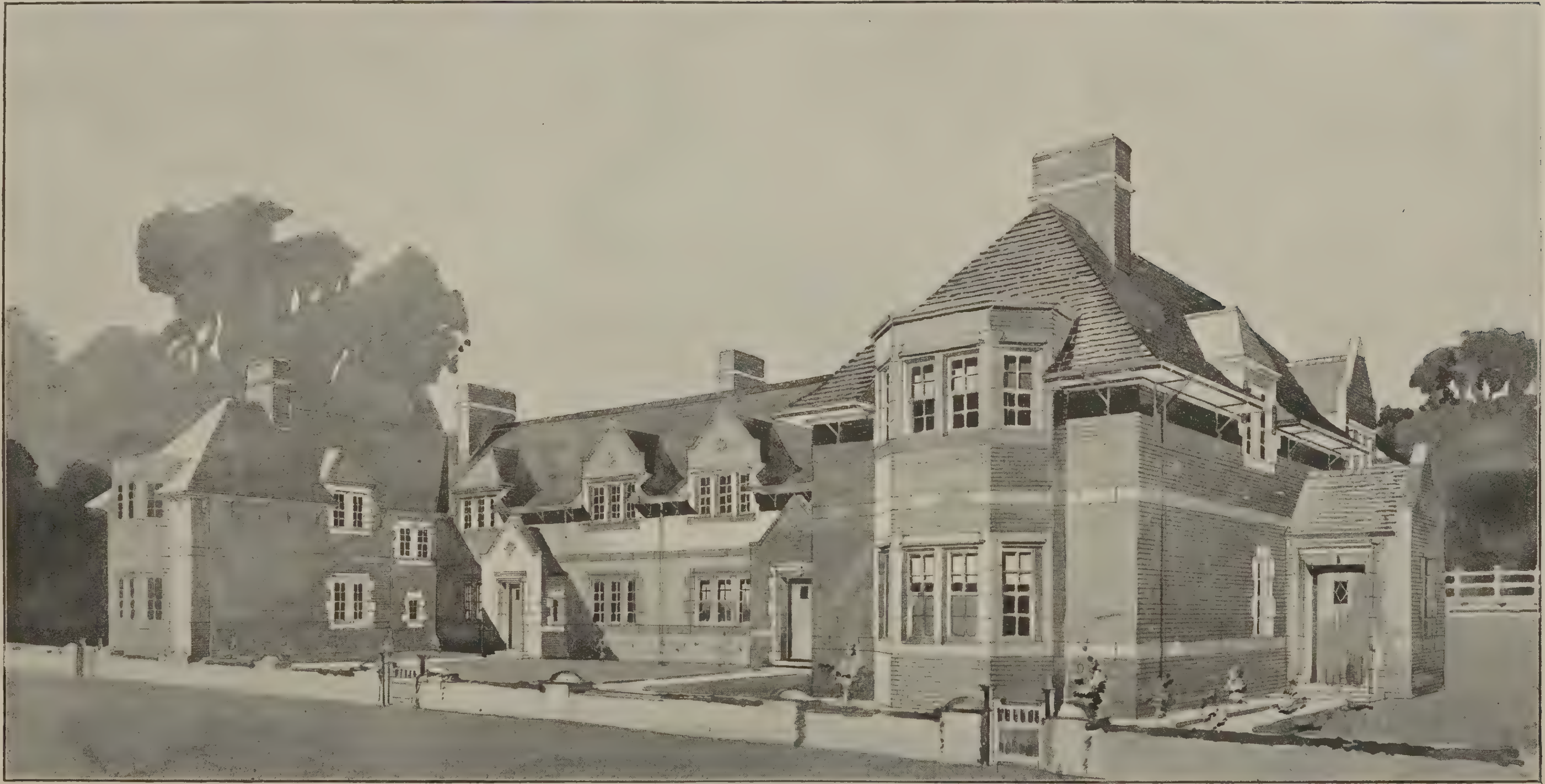

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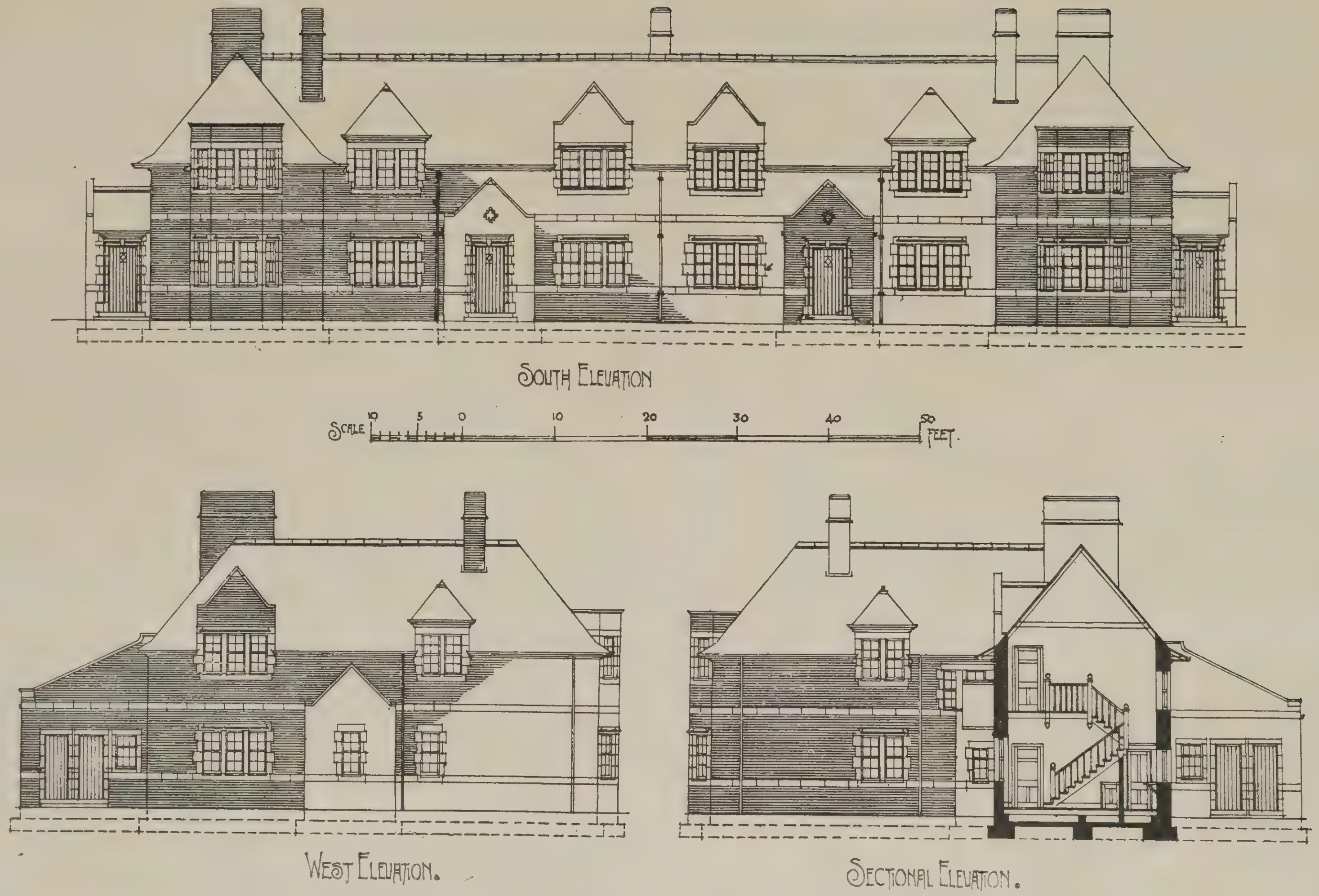

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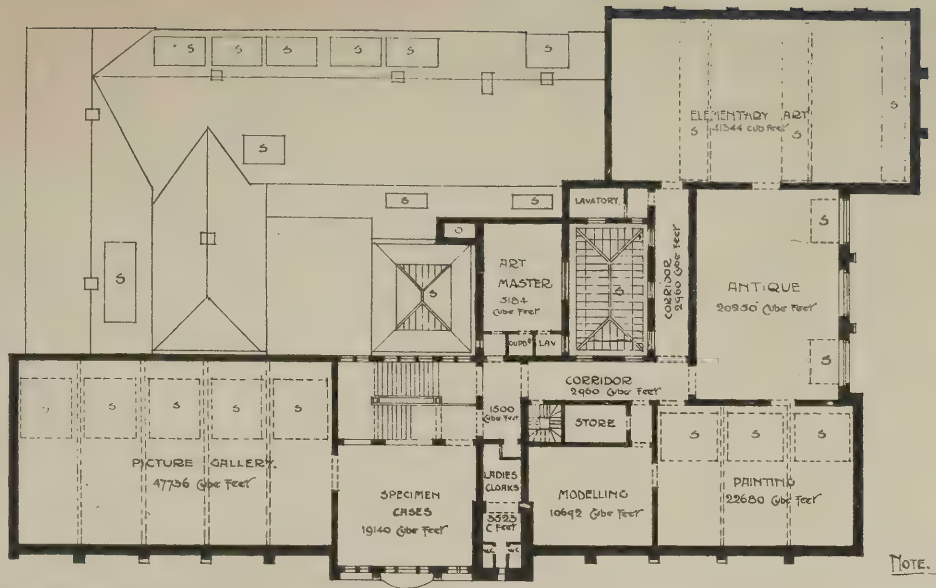
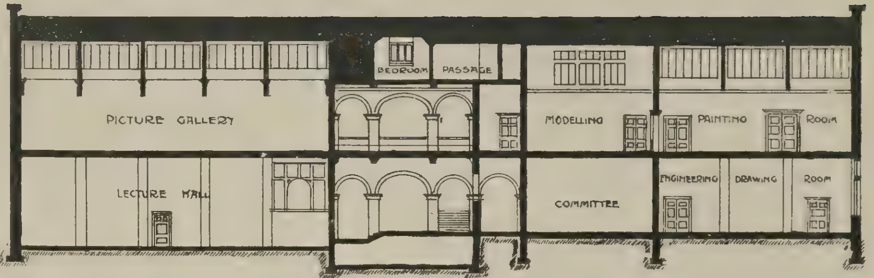
TECHNICAL SCHOOL
BARROW-IN-FURNESS.



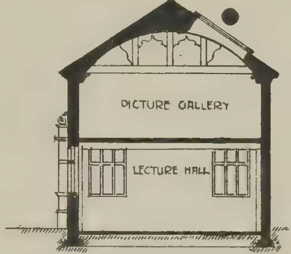
FIRST FLOOR PLAN

Note. The walls left white denote existing old premises and are not included in this Heating scheme

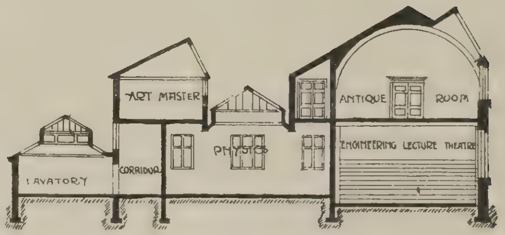


Note. S DENOTES SKYLIGHTS

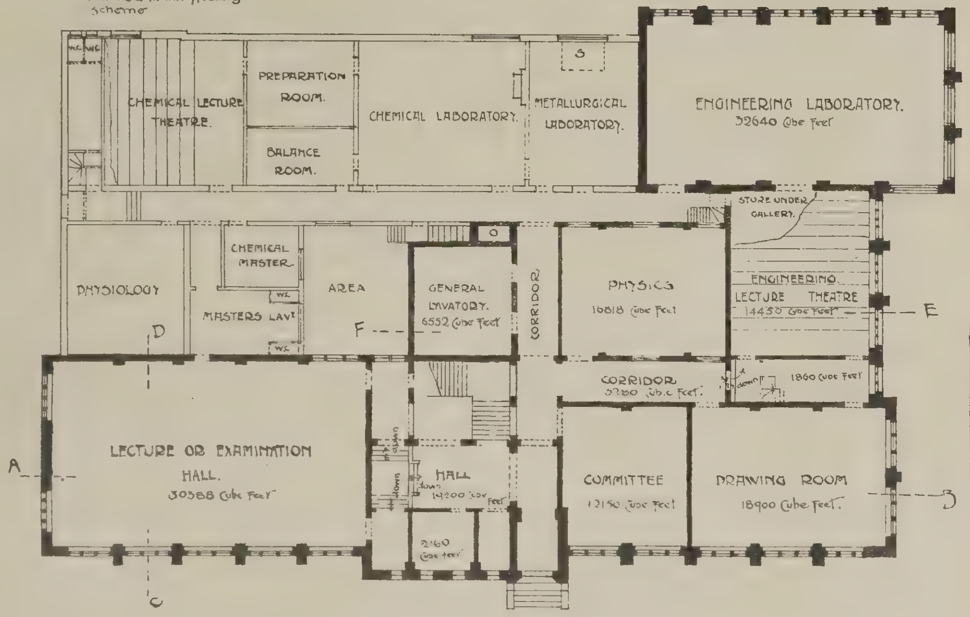
SECTION. A.B.



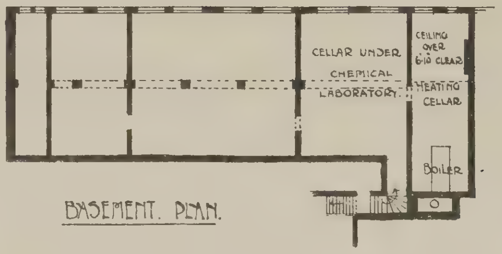
SECTION. C.D.



SECTION. E.F.



GROUND FLOOR PLAN.



BASEMENT. PLAN.

Woodhouse & Willoughby F.R.I.B.A.
Architects & Surveyors
100 King Street, Manchester.

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Correspondence.

ARMY WORKS REFORM.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Mr. Brodrick seems really determined to put our Army right. As an outcome of the Boer War, as well as the result of former Press agitation, a committee has now been formed to enquire into Army works, the barrack scandals of which under the Royal Engineers have become notorious. The committee is composed of Lord Esher as chairman, who is secretary of H.M. Office of Works; Major-General Leach, R.E., General Officer Commanding the Belfast District; Mr. Macvicar Anderson, F.R.I.B.A., past-president of the Royal Institute of British Architects; and, as secretary, Mr. J. M. Bull, of the Accountant-General's Department, War Office. This is a good selection; but to make the Board thoroughly impartial there should have been added a representative of the civil architects, officially styled surveyors, who are employed in the department to do the actual professional work for which the Royal Engineers have so long obtained the credit. Unless this is done, or present members are very wide-awake, the old one-sided system is likely to continue. A medical officer should also have been nominated.

The barrack department originally was wholly civil, but after the battle of Waterloo the Duke of Wellington caused it to be handed over to the military engineers in 1822, solely to prevent their disbandment after the Peninsular Wars. The real technical work, however, was still done by civilians, and has been so performed down to the present day. In 1862 a Barrack Works Committee (consisting of four military officers and three civilians) was formed, and after this the Royal Engineers endeavoured to do away with their civilian helpers altogether, giving their old clerks of works special inducements to retire. They replaced them by military foremen of works—tradesmen enlisted as sappers, who go through a year's course at Chatham. Civilian "surveyors"—really architects and civil engineers (who number 66, although the original warrant was for 78)—were introduced by Civil Service examination in 1882 to bolster up the amateur officers and correct the work of the military foremen of works. In addition to these a host of temporary civilians are employed, in the guise of surveyors, surveyors' clerks, draughtsmen, clerks of works, foremen of works; while the barracks are erected by civilian contractors. The Royal Engineers merely do administrative work, sit tight, and take all the credit. At the present time three-fourths (in some districts four-fifths) of the staff are civil, yet they are carefully kept out of sight and are unknown.

Barrack scandals could be quoted galore, but my object is to place before your readers both sides of the question as to whether the charge of Army buildings should continue under soldiers or under trained architects. Here are the arguments and answers, all cut-and-dried for the Committee.

Military Arguments.

1. Military men for military work.—*Answer:* The building of barracks is *not* military work, but civil work pure and simple.

2. The Royal Engineers are specially qualified for designing military buildings, being soldiers. —*Answer:* This is not so, as the first and all-important qualification is the practical technical knowledge, which can only be acquired in an architect's office and on works. One might as well argue that clergymen are the best men to design churches, doctors to design hospitals, schoolmasters to design schools, lunatics to design asylums, or the householder to plan his own house. But all such people engage architects for lack of their technical knowledge, giving them the necessary data to go upon. Even builders themselves employ architects to design residences for them. The construction course at Chatham only lasts five months, and is purely book-work.

3. The Royal Engineers are superior men.—*Answer:* It is difficult to see where this superiority comes in, as many architects and civil engineers are of equal birth and education. Many of them are much better educated, being university graduates and having professional diplomas besides, which can only be obtained by further examinations.

4. The designing of barracks is not architecture, but only construction.—*Answer:* Even so, a proper and practical knowledge of the latter can only be obtained in an architect's or builder's office after a number of years. It cannot be learnt in book classes at Chatham, nor yet as division officers on barracks. Royal Engineer officers begin at the top and stay there, but to learn one must put aside dignity and begin at the bottom. If they want to be taught construction, then they should be placed *under* the civilian surveyors, who will teach them. But as a matter of fact a great deal of skilful designing *is* required for barracks, which can only be gained with a qualified architect (Sanmicheli is an example of a military architect).

5. The Royal Engineers must be employed in time of peace.—*Answer:* Of course! But that employment should be the same as they will be called upon to do in war—not tinkering at barracks.

6. Works fill in spare time of engineers.—*Answer:* General Sir Richard Harrison, R.E., Inspector-General of Fortifications, stated before the recent Committee on the War Office, 1901, that the corps does many duties, and that they would be wasted if not employed on works, which fill in their spare time, and economy is thus effected. This sounds very well; but if Royal Engineers have any spare time it shows that they are not fully employed on their proper work, which they should be. Secondly, if they do ever have any spare time it should be occupied in *military* duties, not fiddling over barracks. Military science is so great nowadays that the hardest worker can never hope to learn it all. Thirdly, the employment of Royal Engineers on works is a great extravagance instead of economy, because they have far higher salaries than qualified civil architects could be got for; and because of their incompetence they squander thousands which civil architects would save both in planning and execution; also because they are amateurs they are forced to employ civil architects already (called "surveyors" and "draughtsmen"), so that there are actually two sets of officers in the Department—the civil, who really do the work at modest salaries, and the military, who simply supervise, get all the credit, and pocket the large salaries.

7. A Civil Department would not be under military control.—*Answer:* Why not? Every branch of the army in a district is under the General Officer Commanding, and one might just as well say that the civilians in the Royal Engineers Department are not under the control of Engineer officers, whereas they are unfortunately very much so. If the architect officers of the Works Department were given commissions (which they ought certainly to have in order to give them a proper standing) this would at once place them under the full military control of the General Officer Commanding. But if they were not, they would still be under the orders of the General. It must also be remembered that before 1822 the barrack department was wholly civil.

Civil Arguments.

1. Barrack work is not military, but purely civil.

2. Permanent barracks are never erected in war. An army is always on the move, and the troops need only be sheltered under canvas, or by temporary huts, which any labourer can knock together. Wars nowadays are of short duration, and there would be no time to erect substantial buildings in any case.

3. The Royal Engineers cannot possibly be technically trained for the erection of buildings at Chatham, or at any college, or by books. They are amateurs at the best, and practical knowledge can only be gained in a proper office or on works. Architects do not think five years too long to learn their profession in, yet the building and civil engineering course at Chatham only lasts *five months!* The subject of design only occupies three weeks!

4. The Royal Engineers have military ideas incompatible with civil work. For instance, they think it *infra dig.* to draw, saying that is only a draughtsman's business; yet all architects are experts at drawing, as it is the first essential in their profession. They do everything by order, expecting laborious technical operations to be executed in five minutes like a military command. Should a civil official, or a contractor, point out the absurdity of any order, he is peremptorily told his business is to obey, no matter if the work is all wrong. Royal Engineers cannot appreciate the work of the civilians who bolster them up, and the latter never get credit for their ability.

5. A Military Works Department is quite dislocated if a war breaks out, as its military officers, non-commissioned officers and men are liable to be called to the front. Their places have to be filled by volunteers, militia, civilians, and any Tom, Dick, and Harry, hastily collected as temporary stop-gaps. These outsiders know nothing about the Department, and have to be taught their business; but they are put above permanent men, which causes ill-feeling, and is grossly unjust. The result is confusion worse confounded.

6. A Military Works Department is upset even in peace time by officers, non-commissioned offices and sappers having to leave their barrack work to do military duties. Officers go away for weeks at a time to train for their examinations for promotion. Military foremen of works, military draughtsmen, and military clerks (who are non-commissioned officers or sappers) are often absent from the office for portions of days, and sometimes whole days together, to go through courses of musketry, field works, drill, &c. The work is dislocated, or comes to a standstill, in consequence. Drawings, estimates, papers, &c. are frequently taken away from these military people altogether, and handed over to the civil employees, who soon get them done and are always at hand. The military must retire at 55, at their prime, and before the State gets the full benefit of their experience, while the civilians can stop till 65.

7. The dual elements create endless friction. The Royal Engineers keep down their civilian helpers in every way, and make out that they are only subordinates, lest the army and the public should find out the truth. This is naturally resented, and the civilians take every opportunity of exposing the ignorance of the military officers over them, for whom they have no respect; and there is no harmony.

8. In a Military Department the officials do not stop long at one station, whereas those of a Civil Department would. This is most important, as continuity in a Works Department means everything. As soon as an official has learned all about a station, the peculiarities of local materials, the dodges of local contractors, &c., he is packed off for no reason whatever beyond that he has completed five years there. If he is in charge of an important contract, which it is most advisable he should see through, it makes no difference—he goes. It is this perpetual changing which has led to more than one barrack scandal.

9. Civilians honestly do their work, think nothing of long hours, as they are accustomed to them, whereas military officers are more imbued with the idea of being "an officer and a gentleman" than with the spirit of labour.

10. Civil architects come into the Department *already trained* and cost the State nothing for their education. This would save the up-keep of an expensive Chatham staff, and their unsatisfactory productions.

11. Civilians get on with builders much more amicably than military officers, who ride the high horse and sit in state in their offices.

12. Civil architects take a genuine interest in barrack work, which Royal Engineer officers do not, as they are only amateurs and do not understand the technicalities of building operations. The more knowledge one possesses of a subject the more interest one takes in it.

13. All our barracks and fortifications are *already* designed and carried out by civil architects, conveniently styled "surveyors" and "draughtsmen," and they are put up by civil contractors and not by sappers. If all the Royal Engineers were cleared out to-morrow the Department would go on without one iota of inconvenience, and of course far more smoothly. The Royal Engineer officers do not do a stroke of drawing, specifications, quantities, measuring, &c., or any technical work whatever. They merely do administrative duties, supervise, and paralyse the work with correspondence. Therefore, as regards reform, it is only necessary to

dismiss the military element, and the remainder will enable the Department to work without a hitch. No increase of staff would be required, and great economy would accrue all round.

It has been proposed to hand barracks over to the Office of Works, but that would not suit, as the officials of that Department know nothing about military requirements, and they have quite enough to do in designing civil buildings, such as post-offices, &c. It would also mean the interference of a Department which is altogether outside.

The most obvious and sensible course to adopt is to create a proper Army Works Department, composed of the civilians already in it, who know their business; the officers to be called district architects, so that everybody would know exactly what they are, as the term "surveyor" is ambiguous. The nucleus for these already exists in the district surveyors, who are civil officers and really architects. Commissions should be given, but the officials would still remain civilians. We have the Army Medical Corps, Army Pay Department, Army Ordnance Corps, Army Service Corps, Army Chaplain's Department, and why not the Army Works Department? The new title would thus be in line with others. The time has long been ripe for a drastic reform in this branch of our army, and it is sincerely to be hoped that the Committee will unflinchingly give an impartial verdict.—Yours truly, REFORMER.

The Late Charles J. Innocent.

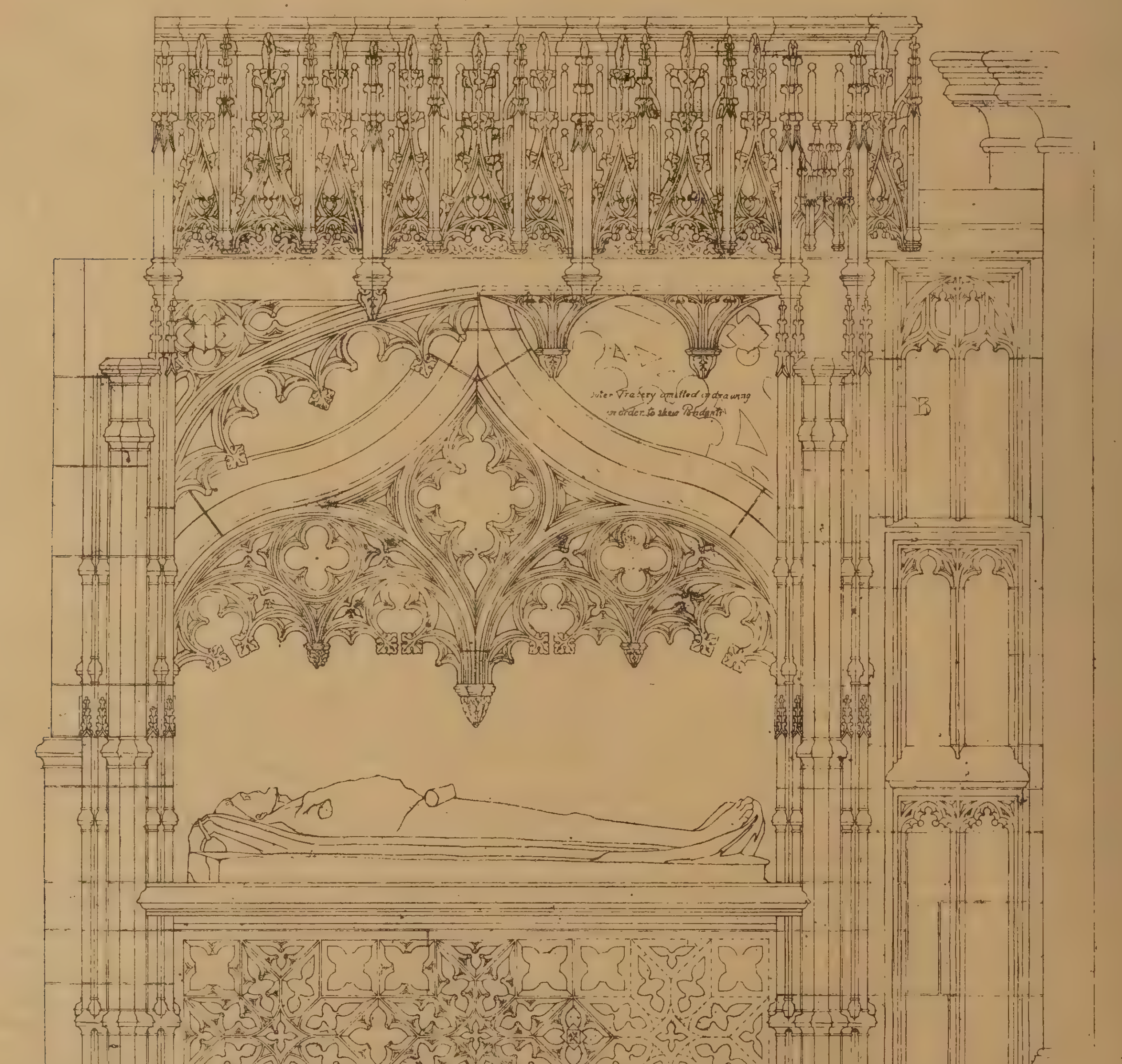
To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—Referring to your kindly and sympathetic notice in last week's issue, permit me, as a life-long friend and an old schoolfellow of the late Mr. Charles J. Innocent, to point out that it was in conjunction with his partner, the late Mr. Thomas Brown, that the deceased was appointed architect to the Sheffield School Board. His book of "Illustrations of Public Elementary Schools erected for the Sheffield School Board," 1873, deals with fifteen local schools then already erected by the partners.

The late Mr. Thomas Brown, like Mr. Innocent, was articled with the then well-known firm of Messrs. Weightman, Hatfield & Goldie of Sheffield. Both the partners were, like myself, pupils of the Sheffield School of Art, the school that the late Alfred Stevens, the sculptor, attended.—Yours truly, HARRY HEMS.

The Cenotaph of Abbot Wakeman in the Chapel of St. Edmund, Tewkesbury Cathedral, is a peculiarly beautiful piece of work dating probably from the beginning of the sixteenth century. On the slab is a representation of the corpse of a monk undergoing the process of decay and being devoured by various lizards, snails, &c.—a rather gruesome contemplation. Immediately over the body, in the centre of the tomb, is a massive ogee arch, richly foliated, from which depends a rather cumbrous pendant The front of the tomb, as seen from the ambulatory, is composed of a very fine arch with its lower edge foliated and the spandrels enriched with quatrefoils. At the top is a projecting canopy in three main sections—a portion of the rest is gone—all of very delicate and intricate carved work.



CENOTAPH OF JOHN WAKEMAN IN TEWKESBURY ABBEY.

New Patents.

These patents are open to opposition until January 20th 1902.

1900.—Heating and Ventilating.—20,239. J. Keith, 27, Farringdon Avenue, London, E.C. Tubular pillars (of wood lined with metal, or of metal alone, porcelain, or other suitable material) rest on the floor, or are suspended from the ceiling. These pillars contain hot-water or steam radiators, and have enlarged air exits fitted with a fan (preferably of the Blackman silent type driven by an electro-motor). Air is taken in at the bottom of the pillar, is heated by the radiators, and is then discharged by the fan into the room at any height. If desired it may be blown against the ceiling or against a domed cushion.

Gas Stoves.—22,645. C. Humfrey, Hilderstone, Hartford, Cheshire. In order to render cheap gas available for domestic heating by open grates, a metal coil is arranged behind the back of the fire. In this way the gas is superheated before being burned, thus improving the efficiency of the grate.

1901.—Fittings for Lavatory Basins.—2,482. N. E. Cooke, Swadlincote, Burton-on-Trent. Extending upwards from the bottom of the basin is a metal tube arranged between two flanges which are separated by distance pieces; and when this tube is raised by the hand the water flows through these latter and so into the waste-pipe. The tube can be kept in its raised position by giving it a turn, or this may be automatically effected by a pin and slot action. The tube extends to the top water-level of the basin and acts as an overflow.

The following specifications were published on Saturday last, and are open to opposition until January 27th, 1902. The names in italics are those of the communicators of the invention. A summary of the more important of them will be given next week.

1900.—20,940, Burdick, apparatus for facilitating the application of colours or liquids to paper, wood, &c. 21,189, Dodd, automatic apparatus for controlling storm waters, compensation waters and flow of sewage. 21,247, Morison, valves. 21,483, Rawson & Littlefield, manufacture of refractory impervious bricks, &c. 21,668, Dyson, apparatus for checking and recording workmen's time. 21,967, Kotko, pantograph for making several copies on different scales at a time. 22,537, Asplen, road-roller scarifier. 22,938, Evans, bolts. 23,256, Forster, calculating slide-rules. 23,823, Locke, slip bolts for doors.

1901.—59, Lees, Lees & Lees, guard for woodworking machinery. 1,040, Green, lifting latches. 1,180, Wells, couplings for metal pipes. 1,272, Russell apparatus for heating buildings by steam. 1,751, Bennett, dry closets. 2,219, McAllan, hinging double-hung window-sashes. 2,303, Sagar & Sagar, hand or hand-and-roller feed wood-planing machines. 3,575, Walton, self-locking pulley-blocks. 9,870, Winn, apparatus for cutting pipes, rods, &c. 12,364, Wright & Darwin, burners for gas heating and other stoves. 12,898, Jones & Stuckey, window-blind bracket. 16,547, Howden & Hume, refuse-destructors. 16,697, Roeder, radiators. 16,794, Barreto, bricks. 18,253, Haddan (*Clayton & Lambert Manufacturing Co.*), plumbers' portable furnaces. 18,303, Schley & Langewiesche, tool for shaping cornices or mouldings in rooms. 19,780, Lewis & Lewis, adjustable swimming baths. 20,130, Goodrich, vices. 20,304, Blancke, tool-holders for planing-machines. 20,446, Humphries & Haigh, means for facilitating the removal of window-sashes. 20,901, Ramsay, veneering or coating bricks.

The Large Hall of St. Winifred's Unsectarian Mission, at Rotherhithe, has just been redecorated by the Kyrle Society. The paintings are the work of Mr. Audley Mackworth, who has presented them to the mission. The central picture, which measures 9ft. by 7ft., represents the "Mayflower" carrying the Pilgrim Fathers to New England.

BUILDING CONSTRUCTION.

(Continued from p. 303 of No. 357.)

59. Having regard to the extent to which thatch, of one material and another, is made use of for roof-coverings, I think it advisable to give some definite information in regard to thatched roofs. The hide of such an animal as a cow may be taken as a type of a thatched roof. The hairs are held fast to the skin at their upper ends and lie in contact, having the same general direction; water, owing to the surface-tension, bridges from one hair to another, and the surplus water is drawn by gravity downwards along the hairs. Whether suggested by the pelts of animals, by the branches of trees, or by other natural shelters, this form was probably the most obvious to savage men; and it is the most common roof-covering employed the world over by people whose resources are not great. We have seen how the Connemara peasant covers his cabin with grass from the neighbouring bog marsh. He has neither straw nor scollops; in some cases rushes are used, and often rushes mixed with flags and other long-leaved plants. The character of the materials varies from one locality to another, and it varies much more widely in different countries of different climates.

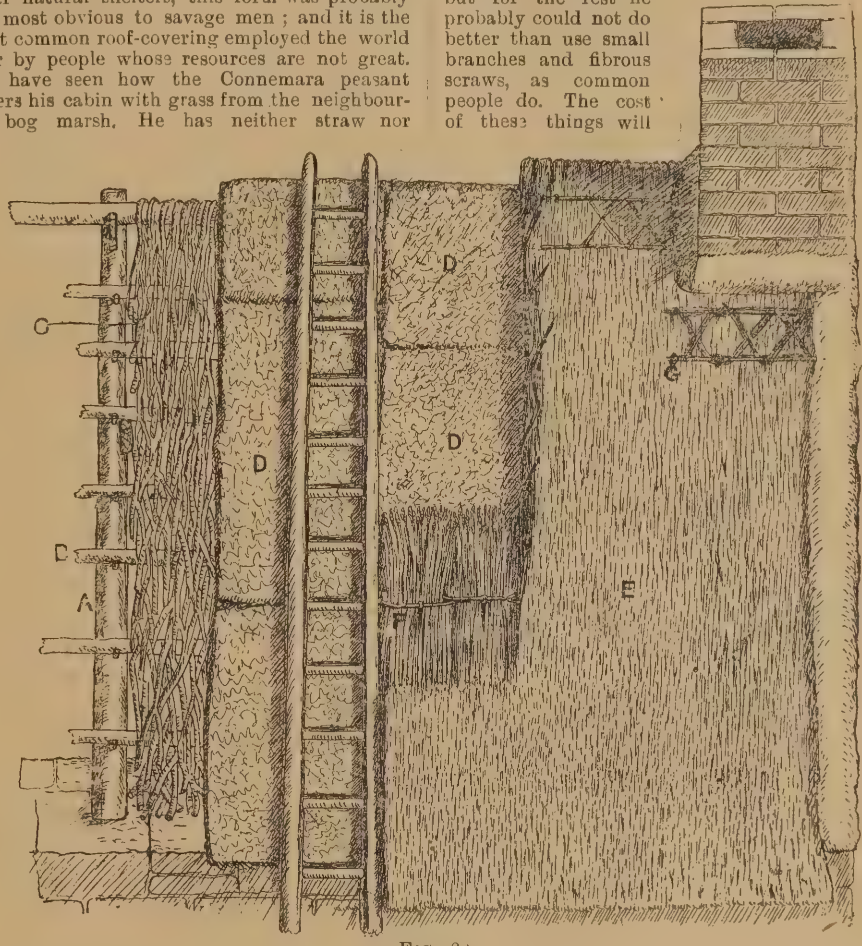


Fig. 80.

Fig. 80 is an illustration of a roof in process of being thatched. A is a couple, B are rough purlins, C is the covering of small branches, D are "scraws," and E is the finished thatch. I have already described (paragraph 55) a thatcher at work; I have only to add a few points to make the simple operation intelligible. A thatched roof ought to have a pitch of not less than 45 degs. The first coat is fastened to the scraws by the scollops F (the scraws are the most fibrous to be had, a minimum of earth and a maximum of fibrous roots; they are laid with the grass side up). These scollops will be covered by the next layer; but every good thatcher is very careful to give each scollop an inclination *with the fall* of the roof so that no scollop will guide any possible wet in towards its point; and to provide for this, and at the same time for sufficient fastening, the pitch needs to be at least 45 degs. The first coat of straw should be about 12in. thick (subsequent coatings may be much less, 4in. to 6in.; any hollow places must be brought up). I have seen a "town" of farm buildings thatched with flax. A crop of flax, the farmer informed me, had got damaged, and he thatched his buildings with it; he said that it would be a very lasting roof-covering. Apart from exceptional cases like this, the best thatch in this country is of good *rye* straw; but a good deal of very good work is done with *wheat* straw. A thatcher and his assistant will cover three "strikes" in a day, and for this they will use in new work about 6 cwt. of straw and 600 scollops. A "strike" is the portion thatched at each change of the ladder, and, of course, depends for its area upon the length of the roof; its breadth is about 2ft. 6in. It may be taken that a good thatcher will do about 1¼ squares in a day, and the work will take the above given quantity of materials. If an architect were specifying for a thatched roof he would probably use sawn timber for his couples and purlins, but for the rest he probably could not do better than use small branches and fibrous scraws, as common people do. The cost of these things will differ in different places; but there can be no great difficulty, from the details I have given above, in estimating the cost of a thatched roof. In my locality a square of new thatched roof would cost:—

		£	s.	d.
Proportion of couples - -	these include labour	0	4	0
Purlins - - - - -		0	3	0
Branches and scraws - -		0	3	6
Straw, 5 cwt. at 3s. - - - - -		0	15	0
Scollops, 500 - - - - - -		0	1	0
Labour—thatcher and attendants - -		0	6	0
		£1	12	6

This will last as a fairly good roof for twelve years, when it will require a fresh coat of thatch at a cost of about 10s. a square; and it will thereafter require a fresh coat every twelve years.

In many situations thatch may be a suitable roof, conveying no suggestion of poverty or misery; on the contrary, well-kept thatch which has been thickened out with regular coatings showing deep overhanging eaves may indicate the generous orderly prosperity which we like to associate with rural life. There is no need to argue that thatched buildings may have all the agreeable qualities which we may desire buildings to have as works of art; thatch is just as good a material in suitable places as any other. Thatch is not suitable on high or exposed buildings; it is altogether out of place in market-towns, where the drip from eaves, which cannot well be furnished with proper eaves-gutters, is bad for pedestrians, both directly, and indirectly, by maintaining a sloppy footpath. The drip from thatch-eaves is a troublesome defect everywhere. The usual provision is to pave (with round cobble pebbles) a margin of 3ft. or 4ft. from the base of the wall, which prevents the formation of a hollow. Unless the eave has a very wide projection the water when it falls splashes up against the wall, and we have a growth of green moss rising some height from the ground. I have never yet seen an æsthetically successful thatch eaves-gutter. Special care must be taken in threshing for straw that is to be used for thatch. It is bad for it to be broken, as it will be if threshed in a threshing machine; the grain must be removed without damaging the straw. The best mode of threshing is to divide the sheaf into handfuls; as much as can conveniently be held is caught near the butt in the hands of the thresher, and he strikes the heads strongly over a round piece of timber (a cask lying on its side is a suitable block). When the grain is taken off, the straw is neatly made up into sheaves and bound in the usual way. With good straw a thatcher can neatly regulate the surface of the roof without any knife-dressing. Tossed straw is sometimes used, but it is quite unsatisfactory. Oat straw is sometimes used for thatch, but it is not good enough.

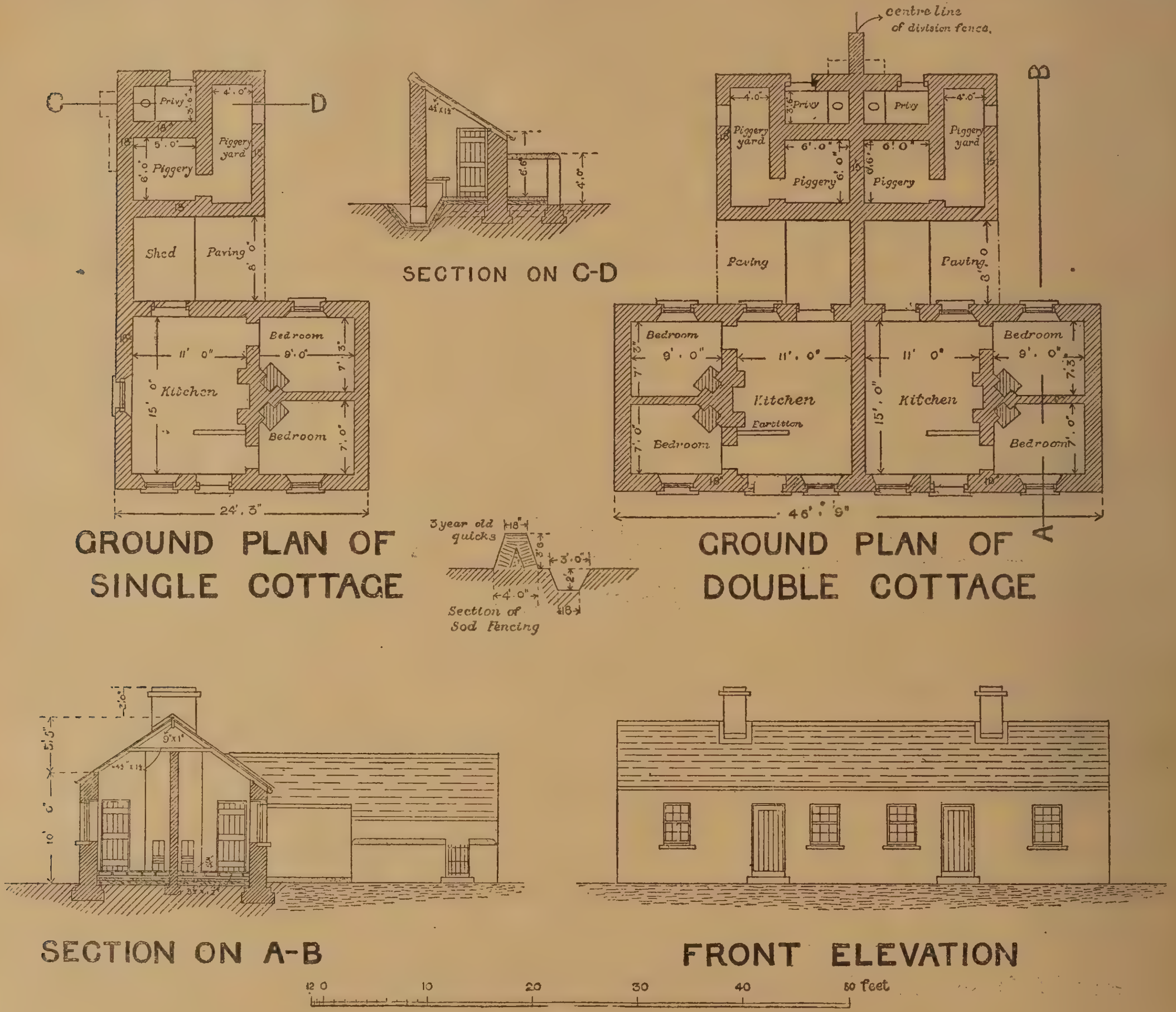


FIG. 81.

60. Fig. 81 shows drawings of labourers' cottages about to be built by the Rural District Council of Portumna, designed by Mr. John Smith, M.I.C.E., county surveyor, of Ballinasloe. I make use of these drawings as representing this class of house: the details which I give may not be as arranged by Mr. Smith, but they are probably not much different.

Walls.—The walls of these houses are built of what I have heard named *raked* rubble masonry. This kind of masonry is quite common, though it does not agree with any description or drawing that I have seen. It is usually built in courses; it is hammer-dressed, and spauls are used to level up the courses and to fill up openings between the larger stones. When built with good mortar it is perfectly good masonry for walls of moderate height, such as these walls are; moreover, it gives a better hold to the rough-cast than closer jointed work would do. The carboniferous limestone of the neighbourhood shows very slight indications of stratification; and the usual condition that stones are to be laid on their natural beds is of slight importance, as is also the case where the stone is granite or whinstone. But a matter of *very great* importance is that the sand with which the mortar is mixed shall be clean and free from earthy or clayey matter. Where the duty of mortar is only to distribute the pressure, tempered clay or puddle would be a perfectly good material with which to fill the joints and beds, *if it were not for the action of frost;* and in countries where there is no frost the masons do not understand our insistence on clean sand. In walls of the class in question the mortar is of more importance than in close-jointed work; and though it is well to insist in all cases in these countries on clean sharp sand, it is specially imperative here, because if this is not attended to the work will not only be bad but it will proclaim itself so to everybody, by the rough-cast scaling off (the sand in the rough-cast must also be clean). It is to provide against the action of frost on soil injuring the building that a trench is sunk in clay to enable the wall to be commenced about 2ft. beneath the surface. The action of frost on a considerable mass of soil, affecting it throughout, is different from its action at the surface of stone.

This kind of walling (in which the mortar is of great importance), when built with good coarse cement-mortar, in wide joints, is very reliable for important works. I call it built concrete. Care should be taken to have the stones clean, if possible with freshly-fractured surfaces, so that the cement will stick to them. Thin walls in cement-mortar may be built in this way equal to concrete walls, and cheaper, because the expense of the moulds is saved and the stones effect a saving in concrete. Good bricks cost about £4 a thousand in this locality, and concrete walls of this kind to separate the bedrooms will be cheaper than brick walls. Suppose that there is no difficulty about the foundation in respect of the soil; that trenches are sunk about 2ft. deep, and made fairly level and of the proper width in the bottom (remember the walls are of no great height): commence by laying a course of good large stones, mostly headers, on the soil (the footing shown is rather wide) to form a course 2ft. 6in. wide. This course should be faced and levelled up in mortar masonry to be about 14in. deep, and in finishing it regard is to be had to the fact that the wall which rests upon it will be taken in 6in. each side, leaving offsets. The setting-out is now carefully checked; if the corners are to be right angles, the "square" should be checked by measuring the diagonals to see if they are equal. Quoins are now set up, and the

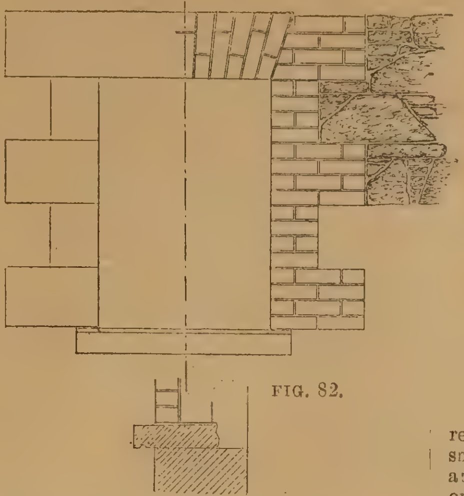


FIG. 82.

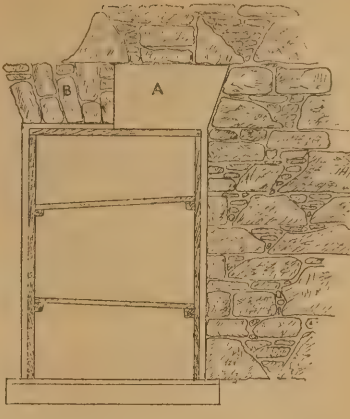


FIG. 83.

first course on the top of the footing course is commenced. It is a good general rule to lay the stones with their largest flat surfaces down on the top of the course below. With stones which show "natural bedding"—that is, which show the layers in which they have been geologically deposited—these largest surfaces will be "natural beds" for any stones. This is the strong way of building. The mason should dress a large stone so as to get two faces as nearly as possible at right angles to one another. The smaller he calls the "*face*," the larger he calls the "*bed*"; and he sets the stone on its *bed* with its *face* to show in the wall. He sets it, having regard to the work in the course below, so as to "break joint"—that is, to bond—and this question of bonding both has to do with the wall lengthwise and across. The spaces between the large stones are filled up with closers and the whole course levelled up to a uniform height, the interspaces between the stones being well filled in with mortar. An 18in. wall is quite thick enough for these houses; if masons are not well looked after they will build thicker than this, and they serve no good purpose by doing so.

With good stones the ordinary quoins may be managed in hammer-dressed work, but dressings for reveals of doors and windows are a very different matter. To be satisfactory these must either (*a*) be worked—chisel dressed; (*b*) be built in brickwork; or (*c*) be worked in concrete. Worked stone is expensive, and it is usual to build such reveals either in brickwork or in concrete.

Fig. 82 shows the usual plat-band arch and dressings in brickwork. I shall later have an opportunity of dealing with brickwork. I intend this house to be an all stonework house, and these brick dressings are merely referred to in passing.

These articles are, I hope, read by workmen who may continue, whether as workmen or foremen, to be every day of their lives employed on works. My own sympathies are with the actual working man. Some hard-and-fast rules of the societies occur to me here. Talking to a friend who is in the building trade, some time ago, he told me that at a job which he had in hand thirty miles away it was necessary to do a trifling piece of masonry (setting two steps, I think), and the rules of the societies compelled him to send a mason these thirty miles to do this one hour's work, though he had bricklayers on the job who could do it quite as well. In a job of the kind before us, would a bricklayer, by society rules, be kept hanging around to build these brick dressings? The designer of a building has at every step to "count the cost," and he requires to have knowledge of matters of this kind. The workmen have quite as much right as, say, the owners of diamond mines to "regulate their output" and to make any rules they think fit. The men with whom there is immediate friction are their employers, who are miscalled capitalists; the people who are really concerned as against the workmen are the consumers, and the consumer is largely the workman himself. Hard-and-fast rules like that referred to are unworkable. I object as strongly as anybody can to what are called "handy men"—"Jacks of all trades"—but be it remembered that to be a good foreman the man must have a touch of the Jack-of-all-trades in him; there must be some reasonable elasticity in "union" rules. I have mentioned regulation of output. I have no hesitation in saying that any regulation of output which involves dawdling at work is vicious—it is bad for the men. Having had experience of what working with my hands for ten hours a day for weekly wages means, I am of opinion that a reasonably educated man cannot live and mentally thrive under such conditions. I think shortening of working hours is, in a double sense, a question of time. But let it be understood that the opposing things are not *capital* and *labour;* the working man's capital is his labour, and the capitalist's capital is the accumulated results of labour of which the capitalist happens to have control. The workman very properly takes every means to enhance the money value of his labour. When he succeeds in doing so, he, as a rule (there are exceptions), increases the value of the capitalist's accumulations. When the value of labour has increased all round the employer who is clever in organizing and managing makes more money, because, assuming that the volume of business remains the same, he has his percentage of profit on a larger cost. The opposing elements are the producers and the consumers; and producers have to take into account the possibility of their being undersold by producers outside their unions, and possibly foreigners. The working man is a powerful voting element, but every householder is a consumer: let there be sweet reasonableness all round. The question is made complex by the existence of capital such as land, coal beds, &c., in the possession of individuals, and by the existence of monopolies as certain railways, where, if a larger proportion of the earnings is paid in wages, there is a smaller share for dividends; but, after all, it is a comparatively simple department of the "dismal science."

Fig. 83 shows how I would work these reveals and lintels, employing moulds and using cement-mortar. The lintel may either be of concrete formed in a mould, and the surface finished smooth, as at A; or, if the stones are suitable, it may be built in cement-mortar as at B. As the wall is to be finished in rough-cast, small stones in such places, as giving by their joints better hold, are rather an advantage. If sashes such as I shall describe are used (balanced one against the other), there is no objection to the window-frames being set up on the stone sills and the reveals built up to them; in this case the moulds for reveals are of a very elementary description. Some cement-mortar may be usefully employed at the quoins when the stone is not of a kind to give good hammer-dressed quoins, or the quoins may be purchased.

It is usual to place wood-lintels in the soffit of the splays of the windows; and a common rule is to give such lintels 1in. of thickness for each 1ft. of span. It is quite a common error to give them too much wall-hold. I avoid the building of timber in walls in every reasonable way. In dealing with more important buildings lintels will be dealt with in further detail; and relieving arches shall be described. In this small house I place a piece of timber 2in. thick, and broad enough to form the soffit of the door or window, and the edge to be flush with the surface of the plaster; and I have it planed smooth on the under-surface so as to be fit for either painting or varnishing. It need have no more than 1in. or 2in. of wall-hold; a few rough spikes are driven into its upper surface to take hold in the concrete, and 9in. deep of concrete is placed to form a concrete lintel over it. It may be necessary to prop this lintel in the centre while the concrete is setting. As I have said that this is to be an all-masonry house, the flues and chimney-stack need special treatment. The chimney breasts may be worked, if necessary using simple moulds and cement-mortar, in ways like those described for reveals, and the openings gathered to the flues. The flues may either be worked round drums (Fig. 84), using either cement-mortar or good common mortar; or fireclay flue-linings (Fig. 85) may be built in as the masonry is carried up. The chimney-stacks will, in any case, require to be formed in moulded concrete so as to be of convenient outside dimensions. The drawing does not show chimney-pots; flue-linings, projecting say 9in. over the top of the stack, will form a useful addition. In working with drums the mortar must not be allowed to set too hard round the drum. After the proper interval the drum is gently twisted by the handle and raised up for a new course.

The student who meets with any technical terms which he does not understand is one who needs to talk to working men and to examine work in progress.

(*To be continued.*)

The New District Church of St. Augustine of Canterbury at Margate, which has been built from the designs of Mr. Dalby Reeve, of Margate, was consecrated recently. It is of brick, with Bath-stone dressings, has cost £5,000, and consists of nave and aisles, to which it is intended to add an apsidal chancel at a further cost of £2,000.

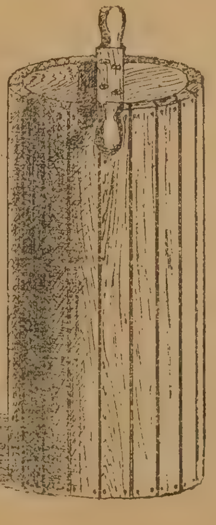


FIG. 84.

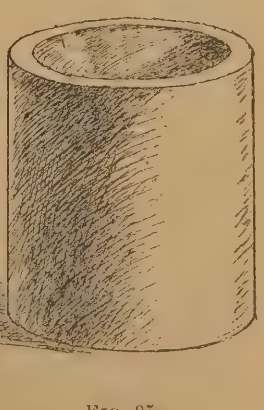


FIG. 85

Builders' Notes.

Dinorwic Slate Quarries.—The Hon. W. W. Vivian, who has for many years held the post of general manager of the Dinorwic Slate Quarries, Carnarvonshire, will retire from that position on January 1st.

Record Building.—All the entire steel framework of a fifteen-storey office-building has just been erected at 68, William Street, New York, in twenty-five days. On November 9th the old building occupying the site was removed and the ground cleared. A huge steel skeleton was then erected, and is now ready for the stone and brickwork. The building will be fully completed in six weeks.

A Prize for Builders.—A Challenge Casket is being competed for under novel circumstances. With the object of hastening on the completion of the Wolverhampton Exhibition buildings now being erected, Mr. Thomas Graham, J.P., chairman of the Executive Committee, hit upon the happy idea of presenting it for competition. It will become the property of the builder who first completes his contract. The casket has been designed and executed at the Wolverhampton School of Art. The accepted design was that of Mr. J. E. Wootton, who competed along with nine other students, and was awarded the first prize of £3 3s. The casket is of silver, and of the value of one hundred guineas. It has enamelled panels containing figures emblematic of the builder's craft, relieved with precious stones, and surmounted by two figures representing "Success." It is 14in. long and 7in. high.

Dissolution of Partnership.—The partnership existing between Messrs. Thomas Gregory & George Cattell Hudson, carrying on business as builders and contractors and woodpaving manufacturers, at Station Works, Clapham Junction, S.W., under the style or firm of Thomas Gregory & Co., has been dissolved by mutual consent as and from December 7th. All debts due to and owing by the late firm will be received and paid by Mr. George Cattell Hudson at the temporary office of the late firm, 11, Andoe Road (adjoining the old works), Clapham Junction, S.W. Mr. Gregory having retired and their old premises having been acquired by the London and South Western Railway Company under statutory powers, Mr. Hudson has decided to join his business with that of his brother at 207, St. John's Hill, Clapham Junction, S.W. The future name of the firm will be Hudson Bros.

Masters and Men.

Barrow Joiners.—The following is the text of the umpires' award in connection with the recent dispute: "That, in accordance with local custom and precedent, and the general practice in other parts of the country where similar work has been performed, Messrs. Gradwell & Co., Ltd., are at liberty to employ shipwrights and handymen and joiners to do the work connected with the repairs to the wharf at Ramsden Dock, and that the work does not devolve exclusively on the joiners."

The Bradford Strike and the City Council.—Fair contracts were considered by the Bradford City Council on December 10th. The strike in the Bradford building trade still drags on wearily, the places of the union men are being filled, and contracts are proceeding. Various attempts have been made to draw the Corporation on to the side of the workmen as against the contractors having Corporation contracts, but so far without success. A resolution was moved that the committees should ascertain whether the workmen engaged on Corporation contracts were receiving the standard rate of wages, and if not, contractors should be required to do so, failing which the penalty clauses of the respective contracts should be enforced forthwith. A letter was read from Messrs. Neill & Holland, solicitors to Bradford branch of the Builders' Federation, saying that the passing of such a resolution would only cause further irritation in connection with the strike. They would also have to advise their clients to take no notice of the resolution if passed, and, if necessary, to fight in the law courts. The question also came up on the minutes of the Finance and General Purposes Committee, where there was a resolution for the appointment of a sub-committee to consider the proper clauses to be inserted in the "fair contract" to secure its observance and to define the term "standard rate of wages." It was decided to obtain the opinion of two counsel as to the position of the Council in relation to the fair-contracts clause. After this, the first resolution was discussed. The standard rate of wages, it was stated, had been departed from. For instance, in the Conditioning House contract, which was let on the 13th of August, 1900, the rate of wages for masons was 9½d. and for joiners 9d.; whereas the rates offered now were—for masons 9d., and joiners 8½d. The same also held good in relation to the contracts for the new fire station, the Manningham car depôt, and the electricity station works. It was pointed out that in the case of the Cartwright Memorial Hall the contract was let when masons were paid 8¾d. Since then the contractor had paid 9½d., and was still willing to pay 9d. The original resolution was finally carried.

Engineering Notes.

The New Bow Bridge is about to be erected by the L.C.C. in conjunction with the Essex authorities. It is proposed that the new bridge shall be 70ft. in width, with a headway in the centre of the span of 8ft. 7in. above Trinity high-water level, or 2ft. higher than the present bridge.

The Electric Tramway Service at Grimsby was opened recently. The system is owned by the Provincial Tramways Company, and the motor-power for the system in the borough is derived from the Corporation works; whilst that for the line from Grimsby to Cleethorpes is supplied by the company's own station. The running powers have been leased from the Corporation for twenty-one years, at an aggregate rental of £30,000.

Electric Street Railway Construction.—A meeting of the Institution of Junior Engineers was held on December 6th, the chairman, Mr. Percival Marshall, presiding. A paper on "Street Railway Construction for Electric Traction" was read by Mr. F. S. Pilling (member), of Devonport. Reference was made to the arrangement of termini as affecting the car mileage, and to the mistake often committed of constructing double junctions between main and branch lines with no provision on the main line at the junction for transferring a car from one line to the other, with the result that when the cars were being distributed in the morning and returning in the evening they frequently have a profitless run of perhaps 300 or 400 yards to the nearest cross-over in order to be transferred to the right line outwards or inwards. The objections to constant radius curves were dwelt upon and the writer showed that the application of railway practice to permanent way construction for tramways on public highways was a mistake. In considering the construction of the track the difficulty was to make and maintain it in an absolutely rigid condition. The weakness arose in the jointing of the rails, the most satisfactory type of which at present to meet British requirements was the girder with a weight of not less 90lbs. per yard. Sole plates were not commended. The adoption of a deeper rail section with a very much wider sole than is usually employed, together with the use of deep-ribbed fish-plates secured by means of six pairs of bolts, would probably be found advantageous; the bonds taking the form of copper rivets of large area, compressed into holes drilled through both plates and the web of the rail. Reference was made to the Falk system of cast-weld solid jointing, it being stated that the joint produced was an expensive one and liable to fracture, though the percentage of failures was claimed to be extremely low. In rail-laying good bonding was very important. In conclusion the best materials to employ in the laying of the paving were considered, the use of all kinds of wood-block paving being regarded as unsuitable.

American Bridge-Builders Beaten.—Messrs. Head, Wrighton & Co., Ltd., the well-known Stockton bridge-builders, have, despite the keen competition of their American rivals, secured a large order for bridge work for South Africa. The order included six 100ft. spans to build three separate bridges, and is from the Natal Government. The utmost expedition has had to be displayed in carrying out the work, and already a portion of the contract has been shipped. The firm has also secured the contract for the erection of the Kingston bridge, near Staines, for the London and South-Western Railway Co.

The Engineering Trade.—The rearrangement of the working agreement in the engineering trade which was made at a conference of the Federation of Employers and the Amalgamated Society of Engineers held in London recently is now being submitted to the operatives for approval. The agreement is that which was drawn up at the close of the great strike a few years ago. It has worked exceedingly well, especially the provisions for avoiding and settling disputes; and since it came into operation there has been scarcely any stoppages of work in the trade. The alterations made at the recent conference were in matters of detail only, and the agreement is still practically what it has always been. The conference was amicable in every way, and the revised agreement is almost certain to be accepted by the men. It has already been accepted on behalf of the employers.

The Society of Engineers held its forty-eighth annual general meeting on December 9th. The chair was occupied by Mr. Charles Mason, president. The following gentlemen were duly elected by ballot as the council and officers for 1902, viz.:—As President, Mr. Percy Griffith; as vice-presidents, Messrs. James Patten Barber, David Butler Butler, and Nicholas James West; as ordinary members of council, Messrs. Joseph Bernays, G. A. Pryce Cuxson, George A. Goodwin, W. H. Holttum, R. St. George Moore, Henry Sherley-Price, Joseph W. Wilson and Maurice Wilson; as hon. secretary and treasurer, Mr. George Burt; as hon. auditor, Mr. Samuel Wood, F.C.A. The following premiums, it was announced, had been awarded by the Council for papers read during the past session, viz.:—The President's Gold Medal to Mr. H. Alfred Roechling for his paper on "The Sewage Question during the Last Century"; the Bessemer premium of books to Mr. Roger G. Hetherington for his paper on "The Main Drainage of Ilford"; a Society's premium of books to Mr. Arthur T. Allen for his paper on "Concrete Subways for Underground Pipes"; a Society's premium of books to Mr. Sydney A. Hollis for his paper on "Preliminary Investigations for Water Supply;" and a Society's premium of books to Mr. J. Freebairn Stow for his paper on "Irrigation Works in South Africa."

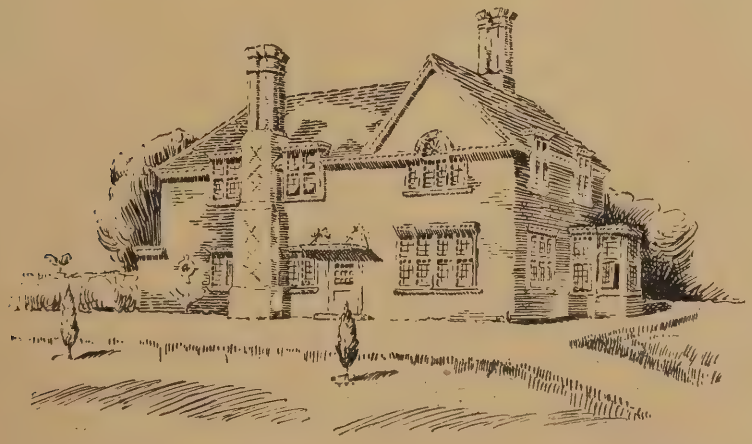
Electric Traction on the Underground Railway.—Mr. Lyttelton, the arbitrator appointed by the Board of Trade, has decided in favour of the scheme proposed by the Metropolitan District Railway Co., known as the "continuous"-current system of electric traction, for the Inner Circle. The "continuous" system, whereby an alternating current of high tension is first transformed and then converted into a direct current of 500 volts, and collected from a third rail into the train motors, is very well known, and it was not seriously questioned by the Metropolitan Company that it had been proved to satisfy the requisites by long and well-tried experience on similar railroads, carrying similar traffic, under similar conditions, both in America and England. The "alternating" system, as carried out by Ganz & Co., of Budapest, proposed by the Metropolitan Company, abolishes the rotary converters employed in the continuous system and introduces into the tunnels where the trains run a current of 3,000 volts carried on overhead conductors and collected thence into the train motors by trollies. Mr. Yerkes has awarded the contract therefore to the Western House Electric and Manufacturing Co., of Pittsburg. The greater part of the work will be undertaken at the company's works at Manchester. The Metropolitan electric generating station will have a minimum capacity of 70,000-h.p., and a maximum of 100,000-h.p. The work will be begun immediately; and within two years from January 1st, 1902, the alterations will be finished.

Surveying and Sanitary Notes.

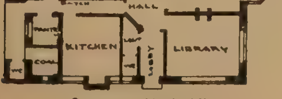
Ecclesiastical Surveyors and Dilapidations.—In the twenty-ninth report of the Ecclesiastical Surveyors' Association allusion is made to the law and practice of dilapidations. At the request of the Practice Committee of the Royal Institute of British Architects they had furnished a report on ecclesiastical dilapidations to be embodied in the new book on dilapidations to be issued by the Institute. It is probable, says the report, that the present Convocations and Parliament will ultimately discover, like their predecessors, that the clergy are most advantageously dealt with under the existing Act, as compared with any other tenants, and that no serious alteration of the law is needed or even possible.

The Condition of the Streets.—The Corporation of London are prosecuting a Bill in Parliament next session to empower them to regulate and control the opening or breaking up of streets in the City by authorities, undertakers, and other persons having statutory or special powers in or over such streets. The number of such authorities and undertakers has of late largely increased, and their powers are capable of being exercised separately and independently of each other. The Bill provides for notices being required of not less than three months before the opening of any streets, together with plans and sections, and for publication of the notices in the thoroughfares affected; for power to the Corporation to prescribe the sequence in which streets may be opened, and the conditions under which the work may be performed; and for prohibiting the reopening of an street for a period of nine months from the completion of any previous work in it without consent of the Corporation or except in cases of emergency. Penalties for infringement are suggested, and there is power of arbitration by the Board of Trade in questions of disagreement between the Corporation and the undertakers.

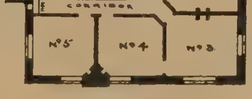
The Roads Improvement Association has addressed to the President of the Local Government Board a memorandum setting out a number of reforms in the existing system of highway administration which, if adopted, the Association considers would go a long way to abate the congestion of traffic and of population in urban districts and to restore prosperity to the rural districts. It is first suggested that there should be created a separate Highway Commission, or a new department of the Local Government Board, as a supreme road authority to advise and supervise local authorities in all matters relating to roads, with power to take action in all cases where local authorities neglect their highway duties. This Commission should also be entrusted with powers to administer Government grants in aid of the maintenance of existing and the construction of new main roads of national importance; to classify main roads; to make regulations as to the offices of road surveyors and municipal and county engineers; to report to Parliament on all tramway schemes; to report to the Board of Trade on light railway schemes affecting public roads; to make regulations as to the width and the methods of construction of roads; to ascertain by experiment the best and most economical methods of maintenance and repair; and to make an annual report to Parliament on the construction and maintenance of roads in England and Wales. It is further suggested in accordance with the recommendations of the Royal Commission on Local Taxation, that one-half of the cost of the maintenance of main roads in England and Wales should be met out of Imperial taxation, the grant to be payable only when the local authority has obtained a certificate from the Highway Commissioners that its roads have been maintained to their satisfaction, and in the case of urban districts and non-county boroughs only when they hand their roads over to the county authority. Other proposals made in the memorandum are that the Highway Commissioners should have power to exempt, on due cause being shown, a local authority from the operation of section 92 of the Lands Clauses Act for the purpose, for example, of enabling a local authority to take a part of the front gardens of a row of houses for a street-widening without having to buy the entire property. With regard to the proposal for the creation of highway authorities over large areas, it is suggested that such authorities should have power to vary and determine the direction of all new streets, and should be required to draw up schemes for the development of their districts, and it is contended that this would have the effect of placing some limit on the enormous expenditure now incurred in street-widenings and improvements and the removal of insanitary areas. Although this expenditure is due to the fact that in the last century property owners and speculative builders were allowed to plan out their estates pretty much as they pleased, building operations are still allowed to be carried on in the suburbs of large towns in the same ill-regulated way, and the inevitable result will be that in the future further large sums will have to be spent.



ENTRANCE FRONT



GROUND FLOOR PLAN



FIRST FLOOR

J HOOPER MAY, ARCHITECT.

Keystones.

New Science Buildings at Watford School have been erected at a cost of £2,000.

A New Asylum is to be erected for the county borough of Newport at Caerleon. The architect is Mr. A. J. Wood.

A Memorial Stained-Glass Window to the late Mr. H. W. Cripps, Q.C., Recorder of Lichfield and Chancellor of the Diocese of Oxford, has been placed in the church of St. John, Frieth, Bucks, on the northern side of the nave.

The New Parish Hall of St. Simon's, Plymouth, has been opened by the Bishop of Exeter. Mr. Ambrose Andrews, of Plymouth, was the builder; and the architect is Mr. Harbottle Reed, of Exeter.

A New Organ at Hawarden Church has been dedicated, and also a churchyard memorial cross on which are engraved the names of six Hawarden Volunteers who have died in the war in South Africa.

A New Infants' School at Dewsbury has been erected in Boothroyd Lane by the Dewsbury School Board at a cost, including half the land (the other half belonged to the Board), of £5,072. The architect is Mr. F. W. Ridgway, F.R.I.B.A.

Design for a House.—The house by Mr. J. Hooper May illustrated on this page is to be built of purple Petersfield brick walls with red brick dressings, rough-cast gables distempered white, and the roof covered with old tiles, all external woodwork being painted white.

At the Old Parish Church at Newbury, dedicated to St. Nicholas, a new stained-glass window has been inserted in the south clearstory by the St. Nicholas Stained Glass Window Society, in continuance of the series which have gradually embellished the church during the past quarter of a century.

A New Empire Palace of Varieties at Hackney has been erected in Mare Street. The general scheme of colouring is cream and grey blues, relieved by draperies in deep Rose Dubarry, with a similar colouring of the walls; and the auditorium is upholstered in embossed deep-rose plush. The stage, 60ft. wide and 40ft. deep, is fitted with all the latest mechanical effects, the lighting throughout being electric. The auditorium, 76ft. from stage front to pit back, with a width of some 80ft, is claimed to be the largest in the Metropolis.

In Pulling Down the Nave of St. Mary Parish Church, Chatham, for the purpose of rebuilding, some beautiful old Norman arches in the west wall have been brought to light. The work has been temporarily stopped in order that a special fund may be raised to preserve these and other remains of the old Norman church. From the resemblance of the work to portions of Rochester Cathedral it is believed it dates back to the twelfth century, and evidence exists that the Norman church of which it formed part remained standing until the second half of the eighteenth century.

Japanese Drawing.—The Japan Society of London held a meeting last week, when a paper was read by Mr. Charles Holme, the Society's hon secretary, on "Some Aspects of the Technique of Japanese Drawing," illustrated by drawings and paintings cleverly done on the spot by a Japanese artist—Mr. S. Kado, of Kioto. Mr. Holme dealt with the paper and other materials on which the Japanese artists worked, the pigments they used, and particularly with their brushes and the varied ways of handling them. The native writing was a product of the brush, a circumstance which largely accounted for the characteristics of the native drawing and painting by the same means. He also described the principal schools of Japanese art, such as the earlier Buddhist school, which in its character was distinctly Indian; the Kano school, which improved on Chinese methods, and had many divisions; the Shijo school, of the naturalistic order; and the Tosa school, whose work was akin to our illuminations of the Middle Ages. The styles of those leading schools Mr. Kado showed in succession by his rapid and effective sketches, both in black-and-white and in colours.

St. Michael's Church Tower, Bristol, is to be restored. The architect is Mr. W. B. Gough, and the estimated cost £1,200.

In Norwich Cathedral a stained-glass window has been placed in the north-east aisle to the memory of the Ven. Henry Ralph Nevill, Archdeacon of Norfolk from 1874 to 1900, and Canon of Norwich from 1873.

A New Unitarian Chapel at Merthyr is being erected in Thomas Street. It is of Late Gothic design, and is to be constructed of bricks with Bath stone dressings. It provides accommodation for about 150 worshippers, and there is a schoolroom underneath, the total cost of the building, including the site, being about £2,000. The architect is Mr. E. A. Johnson, F.R.I.B.A. The contract for the erection was first taken by Mr. John Jones, Glanynant, and upon his death it was transferred to Mr. Edward Lumley, who is at present carrying it out.

A New Women's and Children's Hospital in Leeds is being erected from designs by Messrs. Chorley, Connon & Chorley, of Leeds, with Mr. A. Graham, of London, as consulting architect. The building will be divided into three departments—the out-patients' block, the hospital block and the administrative block. The out-patients' department is planned entirely on the ground floor, and will be quite independent of the hospital proper. The communication will be for the convenience of the staff only. The hospital proper is on four floors. The basement will be used for storage purposes, and on the ground floor there will be a large entrance-hall, board-room, secretary's office, waiting-room, porter's room and other rooms. The whole cost will be about £24,000.

Artistic Signboards.—M. Detaille, the famous military painter, has called the attention of the Prefect of Police to the poor condition into which everything of the nature of a signboard in Paris has fallen, and besought his influence in elevating the artistic character of these ensigns. He has proposed to M. Lépine to hold a competition for shop signs. Of course, Detaille will enter the lists, and several of his fellow Academicians have promised to compete. Great men of the past have painted signboards—to mention two, Morland and David Cox—and today there is no reason why artists of talent should not replace with works of art the impossible animals and figures of signboards that offend the eye both in country and in town. M. Detaille's scheme does not embrace the art of the painter only, sculptors and metal-workers of all kinds may join the competition.

St. Mary's Church, West Malling, has been restored and enlarged. The alterations have been very comprehensive, so far as the body of the church is concerned. The whole of the nave, with the exception of a portion of the east and north walls, has been rebuilt with the north and south aisles, and in the reconstruction an extra width of some 15ft. has been provided. Practically the whole of the fabric of the whole of the earlier church in the Italian style, built about 100 years ago, has been replaced, what Norman work there was being retained in the chancel and tower. The work, which has entailed an expenditure of over £5,000, has been performed by Messrs. Wallis & Sons, of Maidstone, to the designs of Mr. J. T. Micklethwaite, F.S.A., of Westminster Abbey. The rebuilding of the organ was entrusted to Mr. Walmsley, of Maidstone.

A New Boardroom at St. Peter's Hospital, Bristol, for the use of the guardians of the Bristol Union, has been opened. New buildings have been erected at the west end portion of St. Peter's, without interfering with the ancient frontage of the hospital. The architect is Mr. W. S. Skinner, of Edinburgh Chambers, Baldwin Street, Bristol. The alterations have not involved the destruction of any part of the building of any antiquarian or architectural interest, and the unique front elevation has been retained, and also the existing court-room and all the rest of the interior which is of any antiquarian interest. At the same time a new boardroom of suitable dimensions, and other much needed accommodation for the guardians, for the staff, and for the poor applying for relief have been added. Messrs. Stephens, Bastow & Co., Ltd., of Bath Buildings, Bristol, were the builders, and the cost has been about £7,000.

The Architectural Details of Mr. Tree's "Ulysses"—more especially the details of the Homeric house—are, we understand, being designed by Mr. W. R. Lethaby.

A Cold Storage Warehouse at Old Wynd, Glasgow, is to be erected for Mr. William Milne at a cost of about £10,000 for mason and brickwork, steel and cast-iron work, wrought and plumber work alone, exclusive of concrete and granite work. Mr. Alexander Adam, of 212, St. Vincent Street, Glasgow, is the architect.

A New Town Hall and Public Offices at Ilford have been opened in High Road. Mr. B. Woollard, A.R.I.B.A., is the architect. The style is free Classic. The large hall is 76ft. long and 57ft. wide, with an extensive platform and a gallery. The seating accommodation is for 1,000 persons. The cost has been about £30,000.

The Pinnacles and Battlements of the Old Tower of Okehampton Church have been taken down and re-fixed, under the superintendence of Mr. G. H. Fellowes Prynne, architect, of London, as they were considered to be in a dangerous state. A new lightning conductor has also been fixed by Messrs. Hearder & Son, of Plymouth; and Messrs. Aggett & Son, of Chagford, have rehung the bells.

Workshops used as Sleeping Places.—An order has been issued by the Home Secretary under sub-section (3) of section 3 of the Factory and Workshop Act, 1901, to the effect that where a workshop other than a domestic workshop is occupied by day as a workshop and by night as sleeping place, the proportion of cubic feet of space shall not be less than 400ft. to each person employed.

A Statue in Bronze of Vercingétorix has just been completed by Bartholdi. It is now thirty years since the sculptor first conceived the model of this fine work, which represents the heroic Gaul mounted on horseback, with arm raised and sword in hand, evidently in the act of mowing down the invading hordes of Cæsar. The statue is to be erected near Clermont, which is supposed to be the field of the vast struggle between the hero of Averne and the victorious Roman. According to some writers Vercingétorix was besieged in Alésia and forced to surrender. After having adorned the triumph of the conqueror he was strangled in 47 B.C.

The T-Square Club.—Mr. F. W. Pomeroy presided over the monthly "smoker" of this club in the Throne Room, Holborn Restaurant, on Wednesday evening last. The attendance was large and the programme excellent. Messrs. H. Holyoake, S. Spurcell Groom and Wilfred Stracey contributed songs, and Messrs. Graham and Russell gave musical duets. Selections on silver bells were given by Mr. R. B Hopkins, and the violin solos of Mr. John Saunders were much appreciated. The attractions of the evening were, however, the story telling of Mr. G. H. Snazelle, who had just returned from a lengthy tour in Australia, and the marionette sketches by Mr. Walter Graham. The latter were quite a novelty. Mr. Alfred Smythson acted as pianist. During the evening a collection was made on behalf of the "Referee" Children's Dinner Fund, and about £8 was realised.

Royal Academy Prizes.—The following are prize winners in this year's Students' Competitions at the Royal Academy:—*Design for the Decoration of a Portion of a Public Building* (£40), Mr. F. S. Eastman; *proxime accessit*, Mr. W. E. G. Solomon. *Composition in Sculpture*, Boadicea urging the Britons to avenge her outraged daughters (Gold Medal and travelling studentship, £200), Mr. S. N. Babb. *Designs in Architecture*, A Town Hall for one of the new London Borough Councils (Gold Medal and travelling studentship, £200), Mr. Bernard H. Webb. *Set of Architectural Drawings*, Trinity House (Silver Medal), 1st, Mr. Charles T. Palmer; 2nd, Mr. P. I. Elton. *Set of Architectural Designs* (Upper School) (Prize £25), Mr. F. W. Newman. *Set of Drawings of an Architectural Design* (Lower School) (Prize £10), Mr. T. G. Davidson. *Plan of a Building*, A casino and pleasure grounds on the borders of a lake (Prize £10), Mr. L. U. Grace. *Perspective Drawing in Outline* (open to architects only), Lord Burlington's Villa at Chiswick (Silver Medal), Mr. A. C. Bossom.

New Companies.

Arley Brick Co., Ltd.

Registered to acquire the business carried on at Arley, in the township of Blackrod, Lancashire, as the Arley Brick Co., Ltd.: and to carry on the business of brickmakers, miners, dealers in clay, sand, iron, brick-earth, metals and minerals, pottery and earthenware manufacturers, &c. Capital £5,000 in £1 shares. The first directors are J. P. Sheridan, C. B. Craven, J. Miller, T. H. Kevill, J. Redhead and G. Heald. Registered office: 26, High Street, Chorley, Lancashire.

Ashford and District Brick and Tile Co., Ltd.

Registered to acquire the brickmaking business of G. F. Davis, with certain premises, stock-in-trade, plant and effects at Beaver, Ashford, Kent, and at Hope-all-Saints, Kent, and to develop and carry on the same and any similar business. Capital £10,000 in £5 shares. The first directors are J. G. Boorman, G. F. Davis, H. L. Diprose and W. F. B. Jemmett (chairman).

Birmingham Colour Co., Ltd.

Registered to acquire the business carried on by W. Magrath, J. W. Magrath and F. Magrath at Montgomery Street, Birmingham, as the Birmingham Colour Company; and to carry on the business of colour, paint and varnish manufacturers, dealers in oil, turpentine, petroleum, spirits, gums and chemicals, &c. Capital £15,000 in £5 shares (2,000 preference). The first directors are W. Magrath, J. W. Magrath and F. Magrath. The two last-named are managing directors. Registered office: Challenge Works, Montgomery Street, Sparkbrook, Birmingham.

Enamelled Copper Letter Co., Ltd.

Registered to carry on the business of enamelled copper letter manufacturers, manufacturers of letters in wood, metal, porcelain, china, glass, crystal and other materials, sign-writers, shop furnishers, woodcarvers, ironmongers, furniture dealers, &c. Capital £1,000 in £1 shares.

Fleetwood Estate, Ltd.

Registered to acquire from the Fleetwood Estate Co., Ltd., the whole of its properties and undertaking; to lay-out land for building purposes; and to carry on the business of builders, decorators, contractors, &c. Capital £120,000 in £1 shares (60,000 five per cent. preference). The first directors are D. Abercrombie, W. Dronsfield, E. N. Galloway and T. G. Lumb. Registered office: 10, Queen's Terrace, Fleetwood.

Jackson (Birkenhead) Estates, Ltd.

Registered to acquire certain freehold and leasehold tenements and hereditaments in Birkenhead, Cheshire (part of the residue of the estate of the late Sir W Jackson, Bart.), and to carry on the business of builders, contractors, merchants, dealers in stone, sand, clay, lime, timber, hardware, cement, bricks, tiles and other building materials, &c. Capital £4,000 in £10 shares. The first directors are W. Jackson, T. H. Jackson, Sir H. M. Jackson, Bart., W. R. P. Jackson, W. B. M. Jackson, G. M. Jackson and W. Jackson, jun. Registered office: 18, James Street, Liverpool.

Kidderminster Landed Investment Co., Ltd.

Registered to acquire any land, messuages, shops, factories, buildings and hereditaments of any tenure or description in the borough of Kidderminster, Worcestershire or elsewhere, and to develop and turn to account any land by preparing building sites, erecting, decorating, furnishing, and maintaining houses, flats, offices, factories, warehouses, shops, wharves, buildings and works, &c. Capital £3,000 in £1 shares. The first directors are W. H. Talbot, W. Chadwick and T. L. Lea (all permanent).

Ormerod, Whitaker & Sons, Ltd.

Registered to carry on in all or any of their respective branches the businesses of slaters, concreters, asphalters and stone merchants, &c. Capital £3,000 in £1 shares. The first directors are O. Whitaker and J. Whitaker. Registered office: Rake Head Mill, Burnley, Lancashire.

Moffat's, Ltd.

Registered to acquire the patent and patent rights, wholly or partially, of an invention known as the Lucas Incandescent Intensive Gas Lamp, and all such rights, privileges and advantages as G. D. Moffatt has with the Allgemeine Belenchtungs und Heiz Industrie Actien, Gesellschaft, of Berlin. Capital £2,000 in £1 shares. The first directors are G. D. Moffatt and S. Francis. Registered office: 33–5, Charterhouse Square, E.C.

Natal Indestructible Brick Co., Ltd.

Registered to acquire any inventions relating to the manufacture and treatment of bricks, building blocks, or artificial stone from a combination of sand or similar material and lime; to adopt an agreement with the Indestructible Brick Syndicate, Ltd.; and to carry on the business of manafacturers of and dealers in bricks, building blocks and materials, artificial stone, &c. Capital £17,000 in £1 shares. The first directors are Baron Victor Barreto, C. Hall and J. S. Sheldrick.

New Birch Tail Co., Ltd.

Registered to acquire the business of tile manufacturers now carried on by William Goosty, and formerly by the Birch Tile Co., Ltd., at Clarence Street, Hanley, Staffordshire; and to carry on the business of tile, placque and slab manufacturers, manufacturers of articles for hearths, grates, walls, ceilings and floors, &c. Capital £5,000 in £1 shares.

Wilson Estate Co., Ltd.

Registered to acquire certain lands, buildings and properties in or near Liverpool belonging to J. Wilson, and to carry on the business of builders, contractors, decorators, stone, sand, lime, brick, timber and hardware merchants, &c. Capital £1,000 in £1 shares. J. Wilson is governing director for life.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

DUNSTABLE.—For making new roads and paths in Kirby Road, Priory Road, Richard Street, Lover's Walk, and St. Peter's Road, for the Town Council:—

T. Free & Sons, Maidenhead	£2,417	0	0
F. Ray, Bedford	2,361	16	5
G. Powdrill, Luton	2,335	0	0
H. Williams, Harpenden	1,989	15	10
Felkin & Watson, "The Green," Southall, W.	1,932	0	0
H. Bentham & Co., Salford Road, Streatham Hill	1,689	0	0
Bower Bros.,* Halifax	1,532	13	1

V. W. Phillips, St. Mary's Street, Dunstable, 5s. 6d. per foot or 33s. per yard.

* Accepted.

EAST BARNET.—For labour and materials for erecting a bridge at Cat Hill, East Barnet, with approaches thereto, for the East Barnet Valley Urban District Council. Mr. Henry York, surveyor:—

C. Ford, Harlesden	£1,639	0	0
W. Butcher, New Barnet	1,505	0	0
J. Dickson, St. Albans	1,415	0	0
Myers, Gilson & Rose, Hornsey	1,409	10	5
T. Adams, Wood Green	1,392	0	0
Dinnie, Chislehurst	1,338	0	0
G. Bell, Tottenham	1,278	0	0
Kitteringham, Waltham Cross	1,275	0	0
R. Jackson, Finsbury Park	1,193	0	0
J. Willmott & Sons,* Hornsey	1,047	0	0

* Accepted.

EAST FINCHLEY.—For the erection of Baptist Schools:—

Staines & Son	£4,173	0
Lovatt	3,800	0
Mattock Bros.	3,680	0
Gough & Co.*	3,634	0
Grover & Son	3,620	0
T. Barden	3,609	16
Marshall	3,511	0
Johnson & Co., Ltd.	3,498	0
Battley Son & Holness	3,443	0
L. H. & R. Roberts	3,385	0

* Accepted by order of the trustees.

HAYLE (CORNWALL).—For extension of the Foundry Wesleyan Chapel:—

R. Walters, Penzance	£3,157
W. J. Winn, Helston	2,823
W. C. Hodge, Redruth	2,603
G. Miners, Marazion	2,597
J. L. Hosking, Townshend	2,541
White & Thomas,* Crowan	2,479

* Accepted.

HERNE BAY.—For the erection of 25 cottages in Minster Drive, Herne Bay, for the Central Cottage Building Club. Mr. Ernest J. Hammond, C.E., M.S.A., architect, 3 Marlborough Buildings, High Street, Herne Bay:—

C. W. Welby, High Street	£6,075
E. T. J. Adams, Market Street	6,050
Berry Bros., West Cliff Street	5,575
L. Seager, Sittingbourne	5,500
F. Griggs	5,500
J. Jordan	5,375
J. Wilford, Snodland	5,125
J. F. Thompson, Camberwell	5,125
C. S. Smellie, Eddington	4,875
A. S. Ingleton,* High Street	4,750

* Accepted. [Rest of Herne Bay.]

HULL.—For the following plant required for their sub-stations: (Contract 32) six rotary transformers for continuous-current transformation, 2,000 volts to 220 volts, 90 kw. each, for the Electric Lighting Committee:—

Sir W. G. Whitworth, Armstrong & Co., Newcastle	£10,830
F. Suter & Co., London	6,360
Johnson & Phillips, Old Charlton	6,000
Lahmeyer Electrical Co., London	5,400
Electric Construction Co., Ltd., London	5,310
D. Bruce Peebles & Co., Edinburgh	4,940
Sunderland Forge Engineering Co.	4,836
International Electrical Engineering Co., Ltd., London	4,450
T. Parker., Ltd., Wolverhampton	4,230
Bergtheil & Young, Manchester	3,883
Newton Electrical Engineering Works, Taunton	3,495
British Schuckert Co., Ltd., London	3,280
Siemens Bros. & Co., Ltd., London	3,270

LEYTONSTONE.—For extending the buildings at their electric lighting works, Cathall Road, Leytonstone, for the Leyton Urban District Council. Mr. William Dawson, M.I.C.E., Town Hall, Leyton, surveyor:—

Foster Bros., Suffolk Road, Norwood Junction	£5,366	0	0
F. G. Minter, Ferry Works, Page Street, Westminster	4,295	0	0
Viney & Stone, 65 Princess Road, Regent's Park	4.143	0	0
W. Shurmur, Riverside Works, Upper Clapton	4,083	0	0
J. Willmott & Sons, Tottenham Lane, Hornsey	4,000	0	0
W. Gregar & Sons, Jupp Road, Stratford	3,900	0	0
J. Chessum & Sons, Crown Wharf, Bow, E.	3,881	7	11
Patman & Fotheringham, 15 Park Street, Islington	3,840	0	0
G. Parker, 124 Sumner Road, Peckham	3,707	0	0
Thomas & Edge, Anglesea Avenue, Woolwich	3,497	0	0
W. Manders, Abbott's Park Road, Leyton	3,346	9	4
J. Greenwood, 10 Arthur Street West, London Bridge	3,096	0	0
F. J. Coxhead,* 45 Bulwer Road, Leytonstone	2,969	0	0

* Accepted. [Surveyor's estimate, £3,350.]

LONDON, E.—For the erection of a laundry for the Poplar and Stepney Sick Asylum Board:—

F. Gough & Co., Hendon	£15,994
W. Lawrance & Sons, Waltham Cross	15,963
Foster Bros.	15,765
Vigor & Co., Westminster	13,979
Faulkner & Son	13,470
H. Wardrope, Limehouse	13,439
Yates & Co., Campbell Road, Bow	13,400
F. & T. Thorne, Manchester Road, Isle of Dogs	13,389
J. Smith & Son, South Norwood	13,259
J. H. L. Holloway Deptford	13,230
Higgs, Loughborough Junction	13,137
Levy & Son, Islington	13,000
J. Greenwood, London Bridge	12,748
Almond & Son, Ponders End	12,590
Watts, Johnson, & Co.,* Commercial Road, E.	11,677

* Accepted.

LONDON, E.—For the erection of seven workshops in the rear of 24 to 32 Philpot Street, Mile End, E., for Mr. C. D. Taylor. Mr. E. H. Abbott, architect, Warwick Court, W.C.:—

R. & E. Evans	£1,758
H. Hood	1,449
G. Brown	1,398

LONDON, N.E.—For the erection of three workshops and outbuildings at Cassland House, Cassland Road, London, N.E., for the Governors of the Hackney Institute. Mr. A. W. S. Cross, F.R.I.B.A., architect, 58 Conduit Street, Regent Street, W.:—

S. Kind	£2,939	0	0
Cordell & Sons	2,662	6	0
G. Hill	2,546	0	0
Castle Bros.	2,519	0	0
J. Christie	2,493	0	0
Roome & Co.	2,449	0	0
G. Barker	2,433	0	0
Perry Bros.	2,397	0	0
General Builders	2,397	0	0
T. E. Mitchell	2,395	0	0
Cheesum & Son	2,383	0	0
Wilson Bros. & Lamplough	2,379	0	0
G. Parker	2,360	0	0
Sabey & Sons	2,315	0	0
Voller & Goodfellow	2,290	0	0
J. S. Robey	2,289	0	0
Dolman & Co.	2,277	0	0
J. Jerram	2,263	0	0
Killby & Gayford	2,259	0	0
Smith & Co.	2,249	10	6
Gibb & Co.	2,239	0	0
W. Shurmur	2,196	0	0
Foster Bros.	2,192	0	0
Viney & Stone	2,147	0	0
W. Pearce	2,082	0	0
Pollard & Brand,* 32 Summerhill Road, South Tottenham	2,010	0	0

* Accepted.

LONDON, S.E.—For the erection of a sorting office for postmen at Brockley, S.E., for the Commissioners of H.M. Works and Public Buildings:—

				A.
J. Marsland & Sons	£2,415	0	0	£50
G. Barker	2,393	0	0	45
Harvis-Coney & Co.	2,375	9	0	25
Speechley & Smith	2,331	0	0	50
J. Appleby	2,292	0	0	50
General Builders, Limited	2,289	0	0	50
Richardson Bros.	2,281	0	0	—
J. Christie	2,250	0	0	20
H. Groves	2,225	0	0	—
W. H. Lorden & Son	2,222	0	0	—
W. L. Holloway	2,183	0	0	20
H. Flint	2,179	9	6	20
F. Athey	2,117	0	0	65
C. Towner	2,100	0	0	15
T. G. Sharpington	2,090	0	0	50
J. O. Richardson	2,087	0	0	5
H. Leney & Son*	1,995	0	0	20

* Accepted. [A. Old materials.]

LONDON, S.E.—For engineering works in connection with the new public baths, laundry, and library at the corner of Wells Street and Neate Street, Camberwell, for the Camberwell Borough Council:—

Dargue, Griffith & Co., Ltd.	£7,342	2	11
Summerscales & Son, Ltd.	6,990	0	0
R. Crittal & Co.	6,955	0	0
W. G. Cannon & Sons	6,730	0	0
Moorwood & Sons, Ltd.	6,650	0	0
Joel & Potter	6,400	0	0
Hill & Co.	6,368	0	0
J. & F. May	6,000	0	0
Rosser & Russell, Ltd.	5,778	0	0
Berry & Sons	5,619	0	0
Benham & Sons,* Ltd.	5,620	15	0
Babcock & Willcox, Ltd. (boilers only)	1,083	0	0

* Recommended for acceptance.

SOUTHEND-ON-SEA.—For providing and fixing at Southend-on-Sea about 7,000 feet lineal of Norway kerb, 600 yards super of patent indurated stone paving, 127 yards super of pitched crossings, 72 lineal feet pitched channels, &c., for the Highways, Bridges, and Buildings Committee of the Essex County Council. Mr. Percy J. Sheldon, A.M.I.C.E., chief surveyor, Chelmsford:—

A. & B. Hanson, Southall	£1,431	4	0
B. Nowell & Co., Kensington, W.	1,393	11	10
W. Griffiths & Co., Bishopsgate Street, E.C.	1,374	19	6
Lawrence & Thacker, Clapham Common, S.W.	1,350	13	2
R. A. Bonnett & Co., Chelmsford	1,356	10	0
T. William, Southend on-Sea	1,200	0	0
Buxton & Jenner,* Southend-on-Sea	1,197	10	1

* Accepted.

TON PENTRE, RHONDDA.—Adapted for the erection of a police court at Ton Pentre, Rhondda. Messrs. Griffiths & Jones, Ms.S.A., architects, Tonypandy and Cardiff:—

Morgans Bros., Ton Pentre	£3,335	12	8

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Premium, 1/-

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Ordinary Risks, Premium, £3/-/-
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THE MANAGER, BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Dec. 19	Leeds—Showyard	Yorkshire Agricultural Society	J. Maughan, Secretary, Blake Street, York.
„ 19	Belfast—Electric Station Works	—	Electrical Engineer, Station, East Bridge Street, Belfast.
„ 19	Bishop Auckland—Branch Store	Industrial Co. of Flour and Provision Soc., Ltd	F. H. Livesay, 107 Newgate Street, Bishop Auckland.
„ 19	Gravesend—Alterations, &c., to Sanatorium	Town Council	Borough Surveyor, Town Hall, Gravesend.
„ 19	Southwell—Alterations, &c., at Washhouse at Workhouse	Guardians	Mr. Cottam, Surveyor, Church Street, Southwell.
„ 19	Leeds—Fireclay Retorts, Firebricks, &c.	Gas Committee	R. H. Townsley, General Manager, Gas Offices, Leeds.
„ 20	Shaldon, Devon—Wing and Re-roofing	—	Ellis, Son & Bowden, Bedford Chambers, Exeter.
„ 20	Manchester—Administrative Department, &c.	Joint Workhouse Committee	A. J. Murgatroyd, 23 Strutt Street, Manchester.
„ 20	Ballinasloe—Wing to Diocesan College	Most Rev. Dr. Healy	W. H. Byrne, 20 Suffolk Street, Dublin.
„ 20	Loughglynn—Church	Very Rev. Canon White	W. H. Byrne, 20 Suffolk Street, Dublin.
„ 20	Walthamstow—Underground Convenience	Urban District Council	G. W. Holmes, Engineer to Council, Town Hall, Walthamstow.
„ 20	Cork—Warehouse	W. O'Connor & Son	J. F. M'Mullen, 30, South Mall, Cork.
„ 21	Blackpool—5,000 tons of Portland Cement	Highway Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool.
„ 21	Reading—Electric Power Station	Corporation	J. Bowen, Borough Engineer, Town Hall, Reading.
„ 23	Chatteris, Cambs—School	School Board	W. Wren, Mount Pleasant, Cambridge.
„ 23	Southend-on Sea—Forty Workmen's Houses	Corporation	A. Fidler, Borough Surveyor, Southend.
„ 23	Breda, Sussex—Two Cottages	Hastings Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
„ 23	Harrogate—House and Stable	—	Hadkin & Hill, 10, 11 & 12 Prudential Buildings, Bradford.
„ 23	Manchester—Mason's Shed	Paving, &c., Committee	City Surveyor, Town Hall, Manchester.
„ 23	Twickenham—Wrought-iron Bridge with Bridge Abutments.	—	G. F. Sharpe, 57 Chancery Lane, W.C.
„ 23	Southampton—Public Library	—	O. T. Hopwood, Public Library, Southampton.
„ 24	Hartest, Suffolk—Retaing Wall	Melford Rural District Council	W. Carver, Surveyor, Cromwell Villas, Suffolk Road, Sudbury.
„ 24	Upton-by-Chester—Cottage Home	Union Guardians	T. M. Lockwood & Sons, 80 Foregate Street, Chester.
„ 25	Stonehaven, Scotland—Reconstruction of Parish Church.	—	G. P. K. Young, 42 Tay Street, Perth.
„ 27	Coedpoeth, Wales—Wesleyan Minister's House	—	W. Ll. Jones, Architect, Bangor.
„ 27	Dulverton, Somerset—Court House and Police Station	County Council	W. J. Willcox, 1 Belmont, Bath.
„ 27	Glasgow—Plaster, Tile, Glazier Works for Hospital	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
„ 27	Darlington—Branch Stores	Co-operative Society	Clark & Moscrop, Architects, Feethams, Darlington.
„ 27	Morley—Stables, Cart Shed, &c.	Corporation	W. E. Putman, Borough Engineer, Town Hall, Morley.
„ 30	Rudby—School Buildings	School Board	B. Lawrence & Son, Architects, Newport, Mon.
„ 30	Erdington, Birmingham—Pavilions, Boiler House, &c.	Aston Union Guardians	J. North, Clerk, Union Offices, Vauxhall Road, Birmingham.
„ 30	London, S.E.—Sorting Office	Commissioners of H.M. Works	J. Wager, H.M. Office of Works, Storey's Gate, Westminster.
„ 30	St. Budeaux, Cornwall—School and Boundary Walls	School Board	T. R. Kitsel, 1 George Street, Plymouth.
„ 31	Dewsbury—Covered Market	Corporation	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
„ 31	Preston—Underground Convenience	Corporation	Borough Surveyor, Town Hall, Preston.
1902. Jan. 1	Portmadoc—Alterations, &c., to Market Hall	Ynyscynhaiarn Urban District Council	M. Thomas, Surveyor, 20 Bank Place, Portmadoc.
„ 4	Leeds—Hospital Extension	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 7	Holyhead—Infant School	School Board	R. E. Pritchard, Clerk, Bradford House, Holyhead.
„ 13	Cwmcelyn, near Blaina, Mon Infants' School (200 Children).	Aberystruth Shool Board	R. L. Roberts, Architect, Abercarn.
No date.	Meanwood, Leeds—Shop Premises	Smith & Walker	A. E. Braithwaite, 21 Victoria Road, Headingley, Leeds.
„	Aldwick, Bognor—Bungalow	—	Hall Cooper & Davies, 10 Gray's Inn Square, W.C.
„	Southwold—Cottage Hospital	—	C. N. Cubitt, Architect, Brentwood, Essex.
	ENGINEERING:		
Dec. 19	London, N.W.—Electric Fire Alarm System at Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„ 19	Axbridge, Somerset—Laying Water Pipes	Rural District Council	A. Powell, 3 Unity Street, College Green, Bristol.
„ 19	Manchester—Steel Roof	Corporation Gas Department	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester.
„ 19	Houghton-le-Spring, Durham—Water Main	Rural District Council	W. Morley, Surveyor, Houghton-le-Spring.
„ 19	London, E.C.—Locomotive Boilers	Great Indian Peninsula Rly. Co.	J. I. Berry, Secretary, 48 Copthall Avenue, E.C.
„ 19	Cork—Turret Clock	Town Council	City Engineer, Municipal Buildings, Cork.
„ 20	Queenstown, Ireland—Lighting Streets	Urban District Council	J. H. Campbell, Clerk, Town Hall, Queenstown.
„ 20	Sunderland—Cast-iron Condenser and Water Pipes, &c.	Corporation	J. F. C. Snell, Borough Electrical Engineer, Town Hall, Sunderland.
„ 20	Bilston, North Staffs—Electrical Plant	Midland Electric Corporation, Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
„ 20	Walthamstow—Underground Convenience	Urban District Council	G. W. Holmes, Engineer to Council, Town Hall, Walthamstow.
„ 21	Tredegar—Corrugated Iron Hospital	Bedwellty Urban District Council	J. A. Shepard, Clerk, Town Hall, Tredegar.
„ 21	Leeds—Reinstallation of Electric Bells	—	Mr. Bond, Baths Superintendent, Cookridge Street, Leeds.
„ 21	Wray-with-Botton, Lancs—Rebuilding Bridge	Lunesdale Rural District Council	J. Marshall, District Surveyor, Hornby.
„ 23	Lanark—Covered Service Tank	District Committee	Warren & Stuart, 94 Hope Street, Glasgow.
„ 24	Lanchester—Sinking Well	Union Guardians	R. J. Waites, Workhouse Master, Manchester.
„ 27	Glasgow—Smith Work and Electric Lighting at Hospital.	Parish Council	J. Baxter, 243, St. Vincent Street, Glasgow.
„ 28	Reading—Electrical Plant	Corporation	Borough Engineer, Town Hall, Reading.
„ 28	Woodford, Northants—Steel Tower, Windmill Pump, &c.	Parish Council	Mr. Lloyd, Council's Engineer, Thrapston.
„ 30	Granton, Edinburgh—Steel Latticed Girder Footbridge	Gas Commissioners	W. R. Herring, Chief Engineer, New Street Works, Edinburgh.
„ 31	Littleton, Middlesex—Bridge across River Ash	County Council	H. T. Wakelam, County Engineer, The Guildhall, Westminster.
„ 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
	FURNITURE:		
Dec. 19	Alnwick—Six Iron Bedsteads	Workhouse Guardians	Master, Workhouse, Alnwick.
„ 21	Dublin—218 Bedsteads	General Prisons Board	E. Metcalfe, Controller of Industries, Gen. Prisons Bd., Dublin Castle.
„ 31	Weston-super-Mare—Furniture and Fittings	Urban District Council	H. Nettleton, Surveyor, Town Hall, Weston-super-Mare.
	IRON AND STEEL:		
Dec. 20	Glasgow—Steel Rails, &c.	Corporation	J. Young, 86 Renfield Street, Glasgow.
„ 21	Wingate Grange Colliery, Durham—Stores	Colliery Owners	W. Fleetham, Cashier, Wingate Grange Colliery, Durham.
„ 24	Garforth Colliery, near Leeds—Stores	Colliery Owners	Owners of Garforth Colliery, near Leeds.
„ 25	Swansea—Bolts, Nuts, Piping and Fittings, &c.	Graigola Merthyr Co., Ltd.	Graigola Merthyr Co., Ltd., Swansea.
„ 27	Dublin—Castings, &c.	Gas Company	F. T. Cotton, Secretary, D'Olier Street, Dublin.
„ 30	King's Lynn—Ironmongery Castings, &c.	Corporation	H. J. Weaver, Borough Engineer, King's Lynn.
1902. Jan. 30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.
	PAINTING AND PLUMBING:		
Dec. 19	Belfast—Plumbing at Electric Light Station	Corporation	Electrical Engineer, Station, East Bridge Street, Belfast.
„ 20	Chartham Downs, near Canterbury—Painting and Decorating.	County Lunatic Asylum Committee	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
„ 24	Leeds—Painting Baths	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 27	Glasgow—Plumber Work at Hospital	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
	ROADS AND CARTAGE:		
Dec. 20	Walthamstow—Paving, Kerbing and Channelling	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
„ 23	Southend-on-Sea—Making-up Streets	Corporation	A. Fidler, Borough Surveyor, Southend-on-Sea.
„ 23	Southend-on-Sea—Wood Paving Blocks, and Artificial Stone Paving Slabs.	Corporation	A. Fidler, Borough Surveyor, Southend-on-Sea.
„ 23	Brighton—Granite, Kerb and Channel	Corporation	F. J. C. May, Borough Surveyor, Town Hall, Brighton.
„ 25	Kilmarnock—Paving with Whinstone Setts	Town Council	R. Blackwood, Borough Surveyor, Market Bridge, Kilmarnock.
„ 27	Glasgow—Cement Paving	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
„ 31	Bristol—Brushes, Brooms, &c.	Baths Committee	J. Kane, Chief Superintendent, Jacob's Wells Baths, Bristol.
„ 31	Newmarket—Broken Granite Metalling and Flag	Urban District Council	S. J. Ennion, Clerk, Deva Chambers, Newmarket.
1902. Jan. 4	Carrickfergus—Granolithic Footpath	Urban District Council	J. Boyd, Town Clerk, Town Hall, Carrickfergus.
„ 4	Whitley, Northumberland—Street Works	Urban District Council	J. P. Spencer, 30 Howard Street, North Shields.
	SANITARY:		
Dec. 21	Harrogate—Sewer and Surface-Water Drainage, &c.	Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
„ 21	Mevagissey, Cornwall—Outfall Sewers, &c.	St. Austell Rural District Council	T. H. Andrew, 1, Trevarrick Villas, St. Austell.
„ 30	King's Lynn—Disinfectants, Stoneware Pipes, &c.	Corporation	H. J. Weaver, Borough Engineer, King's Lynn.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY—*continued.*		
Dec. 31	Preston—Underground Convenience	Corporation	Borough Surveyor, Town Hall, Preston.
1902. Jan. 6	Lifford, near King's Norton—Refuse-Destructor ..	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath near Birmingham.
	TIMBER:		
Dec. 19	London, W.—Firewood	Workhouse Guardians	Clerk to Guardians, Marloes Road, Kensington.
" 21	Wingate Grange Colliery, Durham—Timber	Colliery Owners	W. Fleetham, Cashier, Wingate Grange Colliery, Durham.
" 23	Southend-on-Sea—Wood-Paving Blocks..	Corporation	A. Fidler, Borough Surveyor, Southend-on-Sea.
" 24	Garforth Colliery, near Leeds—Timber, &c.	Colliery Owners	Owners of Garforth Colliery, near Leeds.
" 25	Swansea—Timber, &c.	Graigola Merthyr Co., Ltd.	Graigola Merthyr Co., Ltd., Swansea.
" 27	Dublin—Timber, &c.	Gas Committee	F. T. Cotton, Secretary, D'Olier Street, Dublin.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 20	Burslem, Staffs.—Isolation Hospital	£100, £50.	A. Ellis, Town Clerk, Town Hall, Burslem.
1902. Jan. 1	Gillingham, Kent—Laying-out Recreation Ground ..	£20, £10 & £5.	F. C. Boucher, Clerk to U.D.C., Gardiner St., New Brompton, Kent.
" 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
" 15	Kirkcaldy—Elementary School (400 pupils)	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
" 20	Dublin—Water Supply and Drainage Scheme	£50.	J. O'Neill, Clerk to North Dublin R.D C., Boardroom, North Brunswick Street, Dublin.
" 31	Bangor—Infants' School	——	A. O. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
" 31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
" 31	Hull—Art School (cost not to exceed £10,000) ..	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
" 31	Newport, Isle of Wight—Queen Victoria Memorial ..	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River ..	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Gateshead—Board School	——	E. J. Harding, Clerk to School Board, Gateshead.

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The Originator and Leading Maker of the Modern System of Ventilating Gearing.

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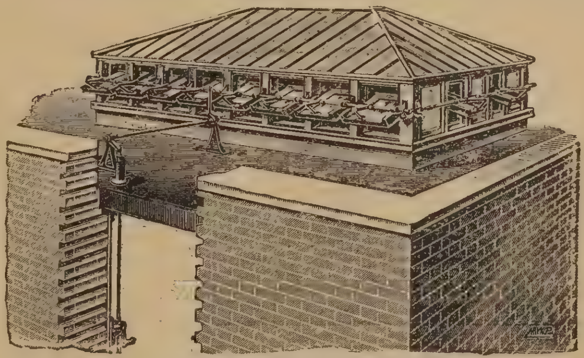

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THE "VICTOR" SILENT DOOR SPRINGS
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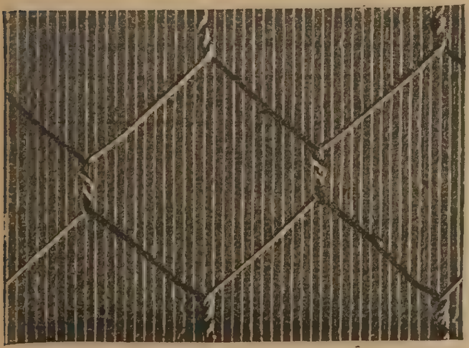

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St. Helens, Lancashire.

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Polished Plate, Silvered and Bevelled Plate for Mirrors,
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Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 11 0	—
Tar, Stockholm	per barrel	1 4 6	—
Turpentine	per cwt.	1 6 9	1 6 10½

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		£ s. d.	£ s. d.
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Do. Petersburg ..	per bundle	0 0 9	0 0 0½
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		£ s. d.	£ s. d.
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Do. Quebec Pine, 1st ..	do.	27 5 0	—
Do. do. 2nd ..	do.	12 15 10	13 0 0
Do. do. 3rd &c.	do.	9 10 0	—
Do. Canadian Spruce, 1st	do.	10 0 0	11 0 0
Do. do. 3rd & 2nd	do.	7 15 0	9 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
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Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba ..	per ft. sup.	0 0 $4\frac{5}{32}$	—
Do. Honduras ..	do.	0 0 1¾	—
Do. Tobasco	do.	0 0 3¾	—
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Do. African ..	do.	0 0 3½	—
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Do. Cuba ..	do.	0 0 $4\frac{7}{16}$	—
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COMING EVENTS.

Wednesday, December 18.

LONDON CHAMBER OF COMMERCE.—Mr. R. Percy Sellon on "The Electrical Industry and Legislation: The Need of Revision," 2.30 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Bailie Mackenzie on "Ventilating and Heating," 8 p.m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Prof. J. Logan Lobley on "The Haslemere Congress of the S.E. Union of Science Societies," 7.30 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Meeting of General Purposes and Finance Committee at 4 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting at 8 p.m.

Thursday, December 19.

LONDON INSTITUTION.—Mr. W. St. Chad Boscawen, F.R.H.S., on "Recent Discoveries at Susa," at 6 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY OF ARCHITECTS.—Second Ordinary Meeting at 8 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Discussion on Mr. Arthur Wright's paper on "Some Principles underlying the Profitable Sale of Electricity," 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Dublin Local Section).—Address by Prof. W. F. Barrett, F.R.S, 7.30 p.m.

Friday, December 20.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. H. Howard Humphreys on "The Manufacture, Testing and Uses of Portland Cement, 7.30 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Mr. William Campbell, B.S.C, on "The Microscopical Examination of the Alloys of Copper and Tin," 8 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. W. G. Peddie on "Wall and Floor Tiles," Mr. John M'Kim on "Substitutes for Tiles," 8 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. A. M. Morgan on "Transmission Dynamometers," 8 p.m.

Saturday, December 28.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—I. 3 p.m.

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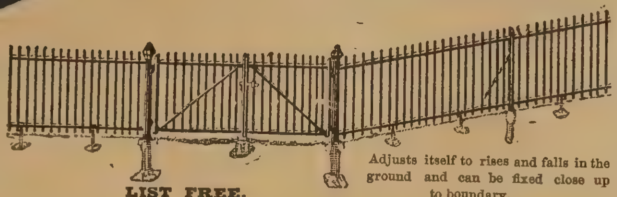

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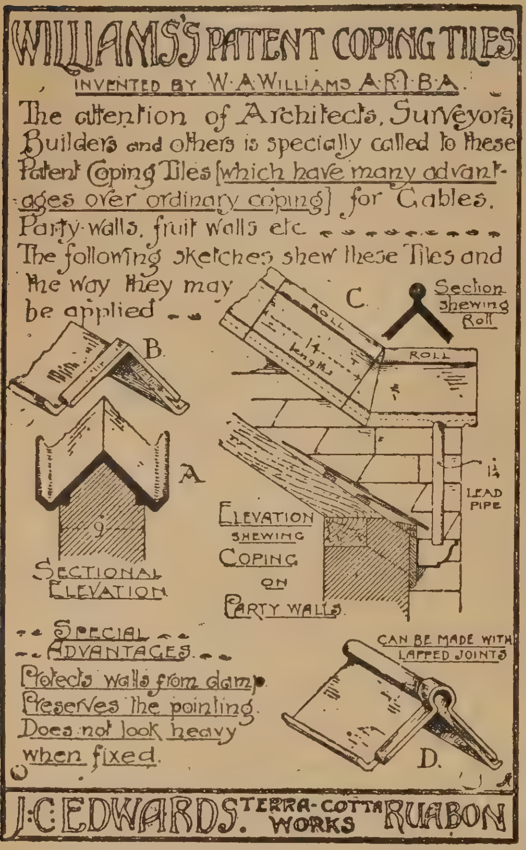

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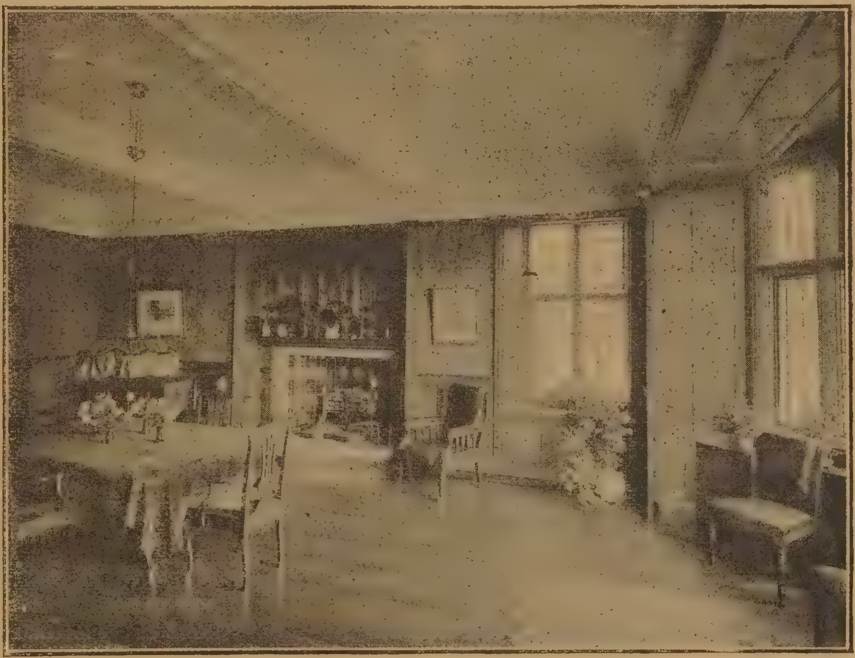
To all our readers—at home and abroad—a Merry Christmas and a Happy New Year.

An Architectural Causerie.

Scrooge: Architect.

MARLEY was dead; to begin with. There is no doubt whatever about that. Marley was as dead as modern Gothic. Mind! I don't mean to say that I know, of my own knowledge, what there is particularly dead about modern Gothic, and if it had been a matter of choice, I should have preferred to say as dead as modern Classic; but this is no matter of concern. Scrooge never painted out old Marley's name. There it stood, on the door-post at the bottom of the stairs; Scrooge & Marley, architects. Sometimes travellers in tiles, or damp-course, or stoneware pipes, called Scrooge Scrooge, and sometimes Marley; but it was all the same to him; and if it had not been for the office-boy (who received five shillings a week and adopted the privileges of a partner) the traveller would never have known of his impropriety. One Christmas Eve old Scrooge sat in his office sullenly turning over the plans of a new house. It was cold, bleak, biting weather, and the fog came pouring in at every chink and keyhole. The door of Scrooge's office was open that he might keep his eye on the draughtsman who, in a dismal little cell beyond, a sort of tank, was just putting the name of Scrooge to a drawing to which he himself could claim the trifling merit of having done it all. But Scrooge paid him well: he paid him twenty-seven shillings a week, and allowed him sixpence for his tea when he remained at the office doing three hours' overtime on a tracing. Scrooge had a very small fire, but the assistant's fire was so very much smaller that it looked like one coal, and when he responded with a "Merry Christmas" to a friend who passed the door, Scrooge said: "Let me hear another sound from *you*, and you'll keep your Christmas by losing your situation": whereupon, the assistant, being meek and docile like all architectural assistants, poked the fire and extinguished the last frail spark for ever. Soon afterwards Scrooge went out, and in a twinkling plans, ink, rulers and pens were out of sight and the office closed.

Scrooge took his melancholy dinner in his usual melancholy tavern, and having read the building papers free of charge, went home to bed. He lived in chambers which had once belonged to his deceased partner—a gloomy suit of rooms. Now, it is a fact that there was nothing at all particular about the knocker on the door, except that it was a very cheap one—like those on houses which are carved at so much a dozen; and it is certain that Scrooge had as little imagination as a member of a Sewerage Board. Yet Scrooge, having his key in the lock of the door, saw in the knocker—Marley's face! To say he was startled would be untrue. But he *did* pause before he shut the door. Then he said, "Pooh, pooh!" and closed it with a bang. He went upstairs and came down satisfied that everything was all right, but as he looked at the Dutch tiles which paved the roomy fireplace there seemed to be on each a copy of old Marley's head. "Humbug!" said Scrooge, and walked across the room. After several turns he sat down again by the fire. As he threw his head back on the chair, his glance happened to rest on a disused bell, which, to his dread, slowly began to swing and ring, and so did all the rest of the bells in the house. Then they ceased and were succeeded by a clanking noise, deep down below. The noise drew closer, closer still, and Marley's Ghost came through the door—the same face, the very same. "What do you want with me?" "Much!"—Marley's voice, no doubt about it. "Do you remember a certain hospital competition?" asked the Ghost. "I do." "And do you recollect how a certain committee went abroad to inspect a hospital there, and how you heard of their intention, and how you got there two days before them and expressed astonishment at meeting them, and how you stayed at the same hotel and smoked the same cigars (their cigars), and how you sent in drawings for the competition, and how remarkably they suited the committee's wishes, and how you won the first premium?" "I do," said Scrooge with bended head. "I am here to warn you that you have yet a chance of escaping my fate. You will be haunted by Three Spirits. Expect the first to-morrow when the bell tolls One." "Couldn't I take them all at once, and have it over?" hinted Scrooge. "Expect the second on the next night at the same hour; the third on the next night when the last stroke of twelve has ceased to vibrate. Look to see me no more, but remember what has passed between us"—with which words the Ghost walked backwards to the window and went out into the night. . . . . . Scrooge awoke. He listened to the quarter, and the half, and the three-quarters; and then the hour bell sounded, dull and melancholy, One. Light flashed up in the room in an instant and an unearthly figure appeared. "Who and what are you," cried Scrooge. "I am the Ghost of the Past." "Long past?" enquired Scrooge. "No. Your Past. Rise! and walk with me!" The Spirit grasped Scrooge by the hand and they walked into the darkness, until a little market-town appeared in the distance. They left the high road, by a well-remembered lane, and soon approached a mansion of dull red brick, a large house, but one of broken fortunes; for the spacious offices were little used, their walls were damp and mossy, their windows broken and their gates decayed. The Spirit touched Scrooge on the arm and pointed to himself. There he was in a long black coat surveying the room with pride. Said he to the two other occupants: "This is a room where some talent has been developed, I believe—we work here, my dear Martin—some architects have been bred in this room—a few, I think, eh, Mr. Pinch? You see some traces of our doings here—Salisbury Cathedral, from the south, a bridge, an almshouse, a jail, a church, a powder magazine—everything for immediate practice. Now let me see how you can employ your time; suppose you give me your idea of a monument to a Lord Mayor of London, or a tomb for a sheriff, or your notion of a cow-house—or a pump is very choice practice. Stay—as you are ambitious, and a very neat draughtsman, you shall try your hand on the proposals for a grammar school. Who knows but that a young man of your taste might hit upon something, impracticable and unlikely in itself, but which I could put into shape—for it is really the finishing touches alone that tell. Perhaps your mind requires to be refreshed by change of occupation—so Thomas Pinch will instruct you in the art of surveying the back garden, or in ascertaining the dead level of the road between this house and the finger-post, or in any other practical and pleasing occupation"—— "Enough, enough!" said Scrooge in a broken voice, "remove me from this place." Scrooge was conscious of being exhausted, and overcome by an irresistible drowsiness; and, further, of being in his own bedroom. He sank into a heavy sleep. . . . . Again the clock awoke him, and he listened. Being prepared for almost anything between a baby and a rhinoceros, he was not by any means prepared for nothing; and consequently, when the bell struck One, and no shape appeared, he was taken with a violent fit of trembling. All this time a beam of light fell on the door knob, and the moment Scrooge touched the latter a strange voice called him, and he went downstairs. There he saw a shape, and cried aloud, "Who are you?" "I am the Ghost of the Present," said the shape; "follow me." Scrooge obeyed the command, and they went out of the house. Walking with alarming rapidity, they soon reached the outskirts of the



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UPPER PART OF HALL, DALSTON HALL, CUMBERLAND. J. W. BENWELL, ARCHITECT.

city, where Scrooge saw, huddled together in ghastly array, a street of houses which he had himself designed. This was the first time he had seen them in reality, for, being the architect, he was only concerned with their appearance on paper and had no occasion to inspect them in course of erection. Each was like its neighbour down to the smallest detail; even the handles of the doors were alike, all beautifully punched and scratched so that they afforded a good "key" for the polish which was used to clean them. In front of each house, and hemmed in by cast-iron railings of spiky design, was a garden quite large enough for two men to stand abreast in; and to relieve its vasty space a path had been provided in order that flowers might be culled from the bed. The front door—how felicitous is the human mind!—was so cunningly painted that you could never mistake it for oak, and set over it was a noble porch that received the drippings of the window sills above, that fell on the place beneath. Having pressed a button without effect for several minutes and then resorted to the knocker, the door opened and the visitors found themselves in a hall lighted through the brightest of blue and red glass. They squeezed past a walnut hat-stand (with deal backing) and reached the dining-room. What a sideboard here displayed itself! What saddle-back chairs (with the fringe torn and the castors off)! What gorgeous mantel-piece of fine slate-marble and surmounted by a cast-iron overmantel, just like wood! And what glass in the windows! How wavy! See yet again the wallpaper, whereon storks fly hither and thither, and flamingoes plume themselves in the shade of Renaissance ornament. Pass the door and into the passage once more. Just peep into the drawing-room and thread your way amid the trinket-crowded tables (best Louis XV. on the hire system; solid rosewood—on the front, for the hundredth of an inch). The hearth is here adorned with brass-coated irons which can never be used, and on the piano are grinning Dutch cats made at Hanley and monkeys from Japaningham. But we must hurry to the kitchen—the most truthful room in the house; then upstairs to the bathroom, where, under the influence of soap, the oak comes off in patches; where the water splashes on the paper-mosaic wall, peeling it, and then trickles back into the cast-iron-marble bath. On the floor of the room are imitation tiles of oiled canvas, and on the window imitation stained glass of waxed paper. A jump from the bathroom brings us to a bedroom where there is a fireplace that will undoubtedly hold two coals at one time, and not far away is another room with no fireplace but with a sloping ceiling. How the windows rattle and let in the rain how the wind blows down the chimneys, how the opening of the doors blows the smoke into the rooms, how the water runs down the back garden and collects in pools against the house, how the eaves leak, what little hot water is obtainable, and how awkward it is to carry coal through the hall into the cellar behind the kitchen! Scrooge saw all these things, and a great sadness came over him. Then the Spirit gripped him again, and away they went, passing town-halls from Belgium, clubs from Italy, and other buildings from everywhere, and so in time Scrooge reached his own doorstep, where he sank exhausted . . . . . The bell struck twelve. Scrooge looked about him for the Ghost, and saw it not. As the last stroke ceased to vibrate he remembered Marley's prediction, and lifting his eyes beheld a solemn Phantom, draped and hooded, coming, like a mist, along the ground, towards him. Scrooge bent down upon his knees; for in the very air through which this Spirit moved it seemed to scatter gloom and mystery. "I am in the presence of the Ghost of Yet to Come?" said Scrooge. The Spirit answered not, but pointed downwards with its hand. "You are to show me things that will happen in the time before us, Ghost of the Future! I fear you more than any spectre I have seen." It gave no reply. The hand was pointed straight before them. "Lead on!" said Scrooge. The Phantom moved away as it had come and Scrooge followed. They scarcely seemed to enter the city; for the city rather seemed to spring up about them and to encompass them of its own act. But there they were, in the heart of it. What a different place it was. No roads of earth or wood or asphalt, but roads of iron whereon every imaginable kind of vehicle rushed like an affrighted thing. On separate paths at each side the people went, not walking nor yet running, but supported on wheels which drove them on at terrific speed, some one way, some another. From the iron roadway, which seemed to form the bed of a cañon, great steel buildings stretched themselves high in the air so that no sun could come to the people below, and no rain, for the paths were covered with glass. Rosettes of cast-iron were affixed to this building and cast-iron statues stood on that, while great girders covered enormous sheets of glass which went down to the very pavement. At the edge of each roof, far up in the sky, brackets stretched out gauntly, holding platforms for air-ships, which filled the air above the city and further shielded the streets from the sun. The Phantom motioned Scrooge, and they passed into one of the buildings. Standing in a cage, they descended into the depths, among the tiers of rooms arranged one below the other, all ablaze with light. The cage stopped and they entered a room where a few men were engaged in watching a large number of machines, whose cams and levers and rackwork created a great din; but the men heeded not the noise, as their hearing had become hardened, so that they were not sensible of the note of a singing-bird. The Phantom pointed to a plate on the door, and Scrooge read there: "Electric Plan Factory." He looked at the machines and perceived to his amazement that they drew and measured automatically, delivering plans, drawings, &c., in dozens, ready stamped and rolled. Here was a machine for designing mouldings, another for taking-out quantities, another for checking illicit commissions, and one for making imaginary perspectives. After visiting these rooms the Phantom pointed upwards, and they returned to the street, just below which, in tunnels, many vehicles and human beings rushed along with great speed. Scrooge felt a choking sensation. "Air! give me air," he pleaded, and the Phantom raised him out of the iron chaos into a purer atmosphere. Then he hurriedly took him back, and, almost dead with fright, Scrooge found himself in his bedroom once more . . . Yes! and the bedpost was his own. The bed was his own and the room was his own. Best and happiest of all, the Time was his own, to make amends in! He ran downstairs and laughed. "I don't know what day of the month it is!" said Scrooge. "I don't know how long

BILLIARD-ROOM, DALSTON HALL, CUMBERLAND. J. W. BENWELL, ARCHITECT.

I've been among the Spirits. I don't know anything." Running to the window, he opened it and put out his head. No fog; no mist; golden sunlight. Oh, glorious! "What's to-day, my fine fellow?" said Scrooge to a boy in Sunday clothes. "Why, Christmas Day." "My boy," continued Scrooge, "do you know the poulterer's in the next street?" "I should hope I did," replied the lad. "An intelligent boy," said Scrooge; "a remarkable boy. Go and buy the prize turkey that was hanging up there. Come back with the man, and I'll give you a shilling. Come back with him in less than five minutes, and I'll give you half-a-crown." The boy was off like a shot, and in less than ten minutes the turkey was labelled and sent off to the assistant's, with Mr. Scrooge's best compliments; and Scrooge himself followed soon afterwards. "A merry Christmas," he said, as his assistant opened the door. "I'll raise your salary and help your family, and we'll discuss your affairs this very afternoon over a bowl of smoking bishop. Make up the fires, and buy a new coal-scuttle before you trace another line, Bob Scratching!" R. R. P.

THE HOUSE THAT JERRY BUILT.

THIS is the man for whom it was planned,
And this is the scamp who put it in hand,
And filled in the footings with stones and sand
With no cement, and said, "It's grand!"
When building the house that Jerry built.

These are the bricks, as soft as cheese,
That broke in two if you chanced to sneeze;
Said Jerry: "The man what don't like these,
Lor, blow me! he *will* be 'ard to please;
They'll last for months—unless there's a breeze"
In the beautiful house that Jerry built.

These are the windows of packing-case wood.
Said Jerry: "Of course it's understood
It'll be extra for windows of real wood;
These 'ere are special, and much too good"
To go in the house that Jerry built.

This is the rubbish that blocked up the drain.
Said Jerry: "Now don't you labour in vain;
Fill it in—it'll never be seen again,
It's ten to one he won't complain;
The cellar is meant to collect the rain"
That falls on the house that Jerry built.

This is the elegant panelled door,
With the natural finish left by the saw,
Which warped till its panels fell out on the floor.
He bought it for six shillings—but "Lor!"
Said Jerry, "it looks worth ten bob more"—
Too good for the house that Jerry built.

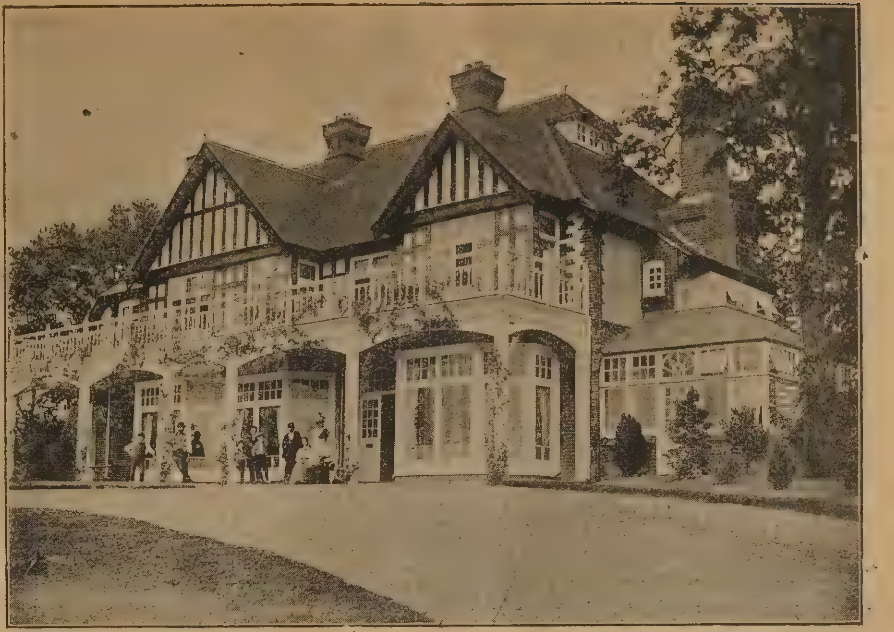
These are the slates—some small, some great,
Most were crooked but a few were straight,
Each kept in place by the next one's weight;
Said Jerry, instructively, to his mate:
"I saves my nails and I trusts to Fate"
When building the house that Jerry built.

These are the locks he bought for a song,
They work three times and then go wrong.
He said: "It's lucky they ain't too strong;
There'll be some repairs a-coming along"
To be done to the house that Jerry built.

This is the price the purchaser paid
(He'd made some cash in the grocery trade);
"Dirt cheap," said the man of trowel and spade,
As the cheque in his horny hand was laid;
"And a better house has never been made"
For the price of the house that Jerry built.

This is the band that came up the road;
The drummer drummed and the cornet blowed,
And as it passed, the house like a flash
Fell suddenly down with a fearful crash,
And all that remained was a heap of smash;
And the owner said words like "blow" and "dash,"
And he stared in amaze at the heap of dust,
While the more he stared the more he cussed
At the vanished house that Jerry built.

A. E. F.



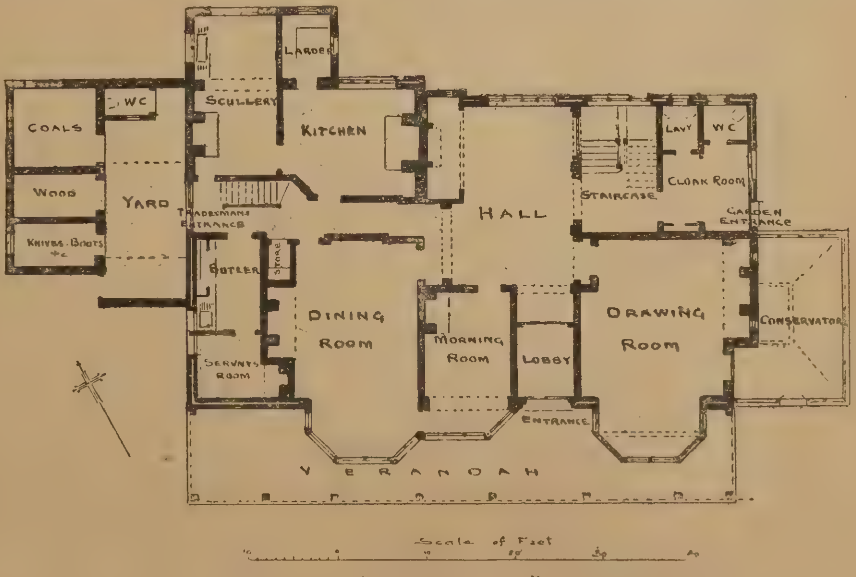
"PARROCK WOOD," HARTFIELD, SUSSEX. CHARLES W. MERRIN, A.R.I.B.A., AND THOMAS R. WAGSTAFFE, F.S.I., ARCHITECTS.

DALSTON HALL, CUMBERLAND.

DALSTON HALL originally consisted of a bell tower, to which additions were made at various times by the Dalston family until it became one of the principal Halls in Cumberland. But it gradually lost its dignity, was used as a farmhouse, and fell into decay. Mr. E. W. Stead became its owner four years ago, and large alterations and additions have been made to it since then. The two towers, with the old work in between, have been untouched as far as possible, but the whole of the interior has been altered to suit the requirements of a modern country-house. The floors to the rooms on the ground floor are all in oak and teak, and the panelling and chimney-pieces are in oak. The floor of the hall (40ft. by 22ft.) is in teak and carried on springs, for dancing. The various contractors have been—for foundations and cellars, Messrs. Beaty Brothers, of Carlisle; general building, Messrs. R. Rathbone & Sons, of Atherton, near Manchester; joiner, Mr. George Black; plasterers, Messrs. Ormerod & Son; plumbers, Messrs. D. Thomson & Sons; slater, Mr. J. Killett; fireproof floors, The Carlisle Fireproof Flooring Co. (all the above of Carlisle); heating, Mr. J. Grundy, of London; range and grates, Messrs. Longden & Co., of Sheffield and London; electric lighting, The "Alliance" (late Veritys), of London. Mr. J. W. Benwell, of Carlisle, was the architect.

"PARROCK WOOD," HARTFIELD, SUSSEX.

THIS house, with stabling for four horses, double coach-house and coachman's rooms, lodge, and other buildings, has been erected for Joseph Titley, Esq. It stands on an elevated site facing south and overlooking Ashdown Forest and the golf links, but it is sheltered from the north and east by a fine belt of trees and rising ground. The south front has a wide verandah extending the whole length of the house, on to which all the principal rooms open. The hall is large, and arranged as a sitting-room with deep ingle. All the passages on the ground and first floors, and the lobby, hall and conservatory, are heated by hot water from the kitchen ranges, without the aid of any separate furnace. The materials employed are, for the lower storey red bricks, and for the upper storey solid pitch pine timbering left rough from the saw, black varnished, with cement rough-cast between, the roofs being covered with dark red tiles. The stables, lodge and other buildings are in keeping. There are also engine- and well-houses, with an oil engine for pumping, saw-driving and electric-lighting. The whole of the drainage is carried to a series of septic tanks at the lower portion of the estate. Mr. J. Luxford, of Forest Row, was the builder; the heating is by Mr. T. Potterton, of Balham. The architects were Mr. C. W. Merrin, A.R.I.B.A. and Mr. T. R. Wagstaffe, F.S.I., of 31, Fenchurch Street, E.C.

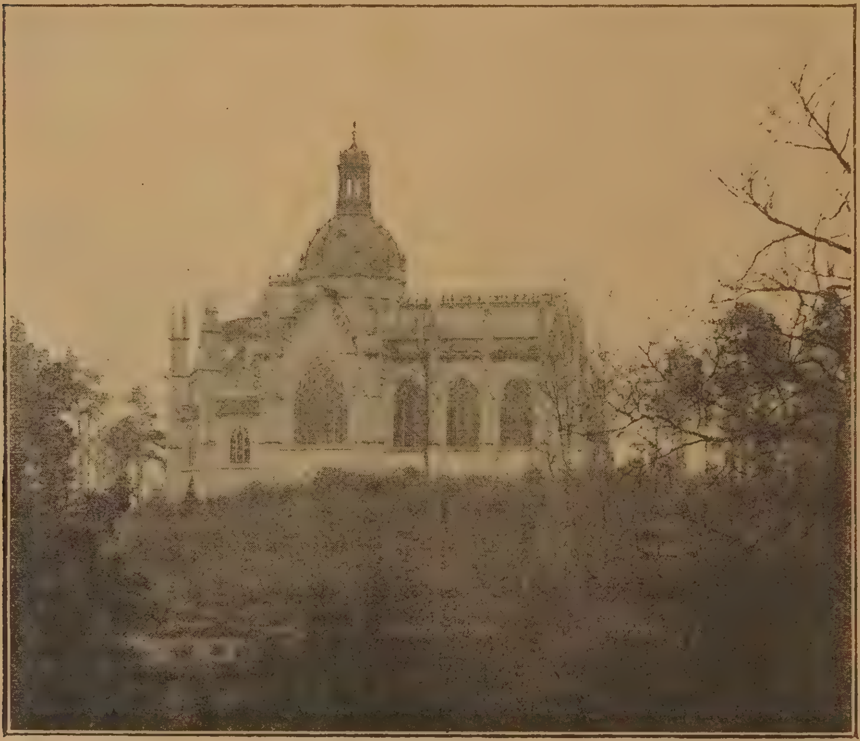


GROUND-FLOOR PLAN OF "PARROCK WOOD," HARTFIELD, SUSSEX.

ST. MICHAEL'S PRIORY, FARNBOROUGH.

By F. H. CHEETHAM.

EVERYONE knows the tomb of Napoleon the First, "by victories guarded 'neath the golden dome that caps all Paris like a bubble." But comparatively few people know that the remains of Napoleon the Third, too, rest beneath a dome, and that within an hour's railway ride from London. It was in January, 1888, on the fifteenth anniversary of the Emperor's death, that his remains, together with those of the Prince Imperial, were brought from Chislehurst, where they had lain in the little Catholic church near the common, to their present resting-place in the mausoleum at Farnborough Hill, Hants, which the Empress Eugénie had built to receive them. The Empress originally intended to have built the mausoleum at Chislehurst, but being unable to purchase the site she wanted near the church, she gave up the idea, and in 1881 removed from Camden Place to her present residence at Farnborough. She bought the mansion formerly belonging to Mr. Thomas Longman, the publisher, and shortly after settling there started the building of the Memorial Church. It was designed by a French architect, De Tailleur, and is said to closely resemble the church of the Abbey of Hautcomb, the ancient burial-place of the Princes of Savoy. It is a florid Gothic structure crowned with a dome and lantern, and, standing as it does on the levelled summit of the hill, can be seen among the trees from the railway to the left as you approach Farnborough from London on the South-Western line.



ST. MICHAEL'S PRIORY, FARNBOROUGH. DE TAILLEUR, ARCHITECT.

"What I want to impress upon you," said Sir Gilbert Scott in one of his lectures at the Royal Academy in 1873, "is that the Dome should be welcomed into our revived Gothic architecture. That revival needs but such a welcoming of all that is good and noble to render it complete, and no feature possesses these qualities in a higher degree than the cupola." Yet to welcome *all* that was good and noble was precisely what the Revival could never bring itself to do, preferring rather to pursue what Mr. Prior calls the path of "ecclesiologist investigation," whereby it became possible to "build Victorian Gothic with all the constructional imitations of any given ten years of mediæval history."

The chief architectural interest of St. Michael's lies in this grafting of the cupola on to a Gothic church. It is not a large building, and its plan is of the ordinary cruciform pattern. Over the crossing rises an octagonal dome crowned with a lofty but well-proportioned lantern. The apse, with its outer aisle and clearstory supported by flying buttresses, has an appearance of great height, as it is built above the slope of the hillside, allowing for a crypt under the whole of the eastern end of the church.

The nave is covered with a single-span roof and is lit by three three-light windows on each side, with buttresses between, terminating in lofty pinnacles. The roofs disappear behind parapets of open stonework, and are finished with an elaborate cresting. Everywhere there is an exuberance of ornament. Flamboyant tracery, crockets, pinnacles and gargoyles of inordinate length go to make up a rather restless whole when seen near to. At a distance, however, the effect is not unimpressive, and the cupola is worked into the design with excellent effect. It is all, of course, on a small scale; and it is an open question whether the effect would be equally good were the scale increased. There is nothing architecturally remarkable in the interior of the church. There is a costly pulpit of carved Belgian oak, and on each side of the altar is a painting by Raphael. The church is used for public worship.

The memorial chapel proper is in the crypt beneath the chancel. It is entered from the outside by a door at the east end of the church. The altar is immediately opposite the door, and therefore at the west end of the chapel. The tombs of the Emperor and the Prince Imperial stand to your right and left under the north and south transepts respectively. The crypt is vaulted, simple in detail, and is lit by wide single-light windows. It is approached also from the church above by means of a fine stair case in teak. The granite sarcophagus of the Emperor was the gift of Queen Victoria, and is inscribed simply "Napoléon III. R.I.P." That of the Prince is similar in design, but has a longer inscription: "Napoléon, Prince Imperial, né à Paris, 16 Mars 1856, mort en soldat à Itrotrotiozy, Afrique Australe, 1 Juin 1879. R.I.P." A space is reserved for the last resting-place of the Empress. The quiet simplicity of the mortuary chapel is in refreshing contrast with the restless detail of the church above. Outside, round the east end, are planted weeping willows—cuttings from the famous tree at Longwood, obtained by the Empress when she touched at St. Helena on her way home from South Africa after visiting the place of her son's death.

Admission to the mausoleum is by ticket, which is purchased at the lodge by the gate on the left-hand side of the main road after leaving the South-Western station. The charge is 1s. The tickets bear the heading, "St. Michael's Priory of the Order of St. Benedict, French Congregation of Solesmes, Farnborough, Hants." The priests live in a red-brick house immediately on the south side of the church. The house is L-shaped, with a rather clumsy octagonal tower in the inner angle, surmounted with a high pointed roof and lantern. The recent Association law in France has had the effect of sending to our shores the Benedictines from Solesmes, who are to make their headquarters in future at Appledurcombe House, in the Isle of Wight, the ancient seat of the Earls of Yarborough.

Farnborough Hill mansion itself is some little distance from the church. It is well shut in by trees, and is difficult to get a view of in summer. It is a picturesque-looking "half-timber" house, but with more of a Swiss than an English air about it. It is the last place on earth you would associate with the Second Empire and the name of Napoleon. It was formerly known as Windmill Hill. The property once belonged to Dr. Chandler, Dean of Chichester, whose nephew sold it, about 1859, to Mr. Longman's father, who erected the present building. Considerable additions and internal alterations have been made by the Empress, but the well-known sign of Mr. Longman's firm, the Ship and Swan, can still be seen in places carved on the outside walls of the house.

Of course the historic interest at Farnborough Hill is its chief attraction. But apart from this there is a real interest in the design and architecture of St. Michael's Church, with its attempt to tread where our Gothic revival dared not venture. We may not care to emulate M. De Tailleur in his treatment of detail, but it is possible to receive suggestions from him in his general design. His Gothic cupola may be pronounced entirely successful. It is part and parcel of the building, not a detached feature in any sense, and its lines are in harmony with those of the rest of the structure.

We were reminded quite recently that the Gothic revival is not dead, though some thought, and more hoped, that it was. Liverpool, however, having expressed a desire for a "Gothic Cathedral," Sir Gilbert Scott's words recur to the mind, more especially, perhaps, as Mr. Emerson's selected design in the former Liverpool Cathedral competition attempted to solve this very problem of the cupola applied to Gothic architecture.

St. Michael's may not be worth while the thirty-three miles journey from London to Farnborough merely on account of its architecture. But there are many people who must find themselves now and again in the vicinity of Aldershot Camp to whom a visit to the imperial mausoleum would be of interest. This is not the place to adorn the tale by pointing a moral; but the architect, being, as we like to think him, a man of finer and more refined sentiment than he who gives up all his days to mere buying and selling, should not be slow to feel the immense pathos of the story that has brought about the rearing of this imperial tomb on a foreign soil.

A New Workhouse Infirmary at Sunderland has been erected on ground adjacent to the local workhouse, at a cost of about £40,000. The architects are Messrs. W. and T. R. Milburn. The new infirmary, which is designed to accommodate 200 patients, really consists of four departments—an administrative block, a pavilion for male inmates, a pavilion for females and a maternity hospital. Externally the buildings are of brick, faced with Sherburn House bricks; the lighting is by electricity, derived from the Corporation power stations; and the heating is accomplished by the means of the American Radiator Co.'s system. The contractors are Messrs. D. & J. Ranken, of Sunderland. Mr. A. J. Wilkins has acted as clerk of the works.

EIGHTEENTH-CENTURY ARCHITECTURE IN ENGLAND.*

BY J. A. GOTCH.

THE eighteenth century saw the final development of that great movement in art which began in the early years of the sixteenth. When mankind had once made up its mind that the masterpieces of Italy were the only examples worth following, nothing but time and determination were wanted to produce throughout Europe a general similarity of appearance and treatment in every branch of art. In no branch was copyism so contagious as in architecture, and in no branch was it so injurious. For architecture is essentially a constructional art, a fact which the eighteenth century did not realize (a constructional art, to be healthy and natural, must develop from within, and not from without), and a fact which wants no little reiteration at the present time when there seems to be a tendency to neglect construction for more attractive accessory subjects, and to desert the stately queen for her livelier handmaids.

Architecture in the eighteenth century was the Five Orders and nothing more. An old Roman, called Vitruvius, who had been dead 1700 years, was dictator, and those of his followers who differed from his precepts, although sometimes excused on account of their success, were admonished to be careful how they risked any deviation from the paths of perfection which he had pointed out. Gothic architecture was despised and regarded as barbarous. It was not that the votaries of the art preferred a Classic dress to a Gothic; for them the buildings erected in the Middle Ages were not architecture at all. The "Gothick Order," as they called it, is described by one of them as "the Folly and very Ape of Architecture." Such an attitude of mind is hardly intelligible to us, who recognise in Gothic architecture at once the most logical and daring form of construction that man has yet employed. It is hardly less difficult to understand how they can have failed to be impressed with the majestic solemnity of a great Gothic cathedral, and yet they did fail—even such cultivated men as Evelyn and Addison. The phrase about the "very Ape of Architecture" occurs in a treatise by a lively Frenchman, M. Freart, and, considering the subject, a very entertaining treatise it is. But Evelyn's views were those of a sagacious unimpassioned Englishman, and are worth quoting at some length as illustrating the standpoint from which the early eighteenth century looked at the subject. In treating of architecture, he says:—

"It is the antient Greek and Roman Architecture only which is here Intended, as most entirely answering all those perfections requir'd in a faultless and accomplish'd building; such as for so many Ages were so renowned and reputed, by the universal suffrages of the civiliz'd world, and would doubtless have still subsisted. had not the Goths, Vandals and other Barbarous Nations Subverted and demolish'd them, introducing in their stead a certain fantastical and licentious manner of building, which we have since call'd 'Modern' (or Gothic rather), congestions of heavy, dark, melancholy and Monkish Piles, without any just proportion, use or beauty, compar'd with the truly antient: So that when we meet with the greatest industry, and expensive Carving, full of fret and lamentable imagery; sparing neither of pains nor cost; a judicious spectator is rather distracted and quite confounded than touch'd with that admiration, which results from the true and just symmetrie, regular proportion, union and disposition; great and noble manner which those august and glorious fabrics of the antients still produce.

"It was after the irruption, and swarms of those truculent people from the north, when instead of those Beautiful Orders they set up those Slender and Misquine Pillars, or rather bundles of Staves, and other incongruous props, to support incumbent weights, and pondrous Arched Roofs, without Entablature; and tho' not without great Industry nor altogether naked of gaudy sculpture, trite and busy carvings; 'tis such as rather Gluts the Eye, than Gratifies and Pleases it with any reasonable Satisfaction: For Proof of this (without Travelling far abroad) I dare report my self to any Man of Judgment, and that has the least Taste of Order and Magnificence; If after he has look'd a while upon King Henry the VIIth's Chapel at Westminster; Gaz'd on its sharp Angles, Jetties, Narrow Lights, lame Statues, Lace and other Cut-work and Crinkle Crankle; and shall then turn his Eyes on the Banqueting-House built at White-Hall by Inego Jones after the antient manner; or on what his Majesties present Surveyor, Sir Christopher Wren has lately advanc'd at St. Paul's and compare them judiciously without partiality and prejudice; and then pronounce, which of the two Manners strikes the Understanding as well as the Eye, with the more Majesty, and Solemn Greatness. In this sort have they, and their Followers ever since fill'd, not all Europe alone, but Asia and Africa besides, with Mountains of Stone, vast and Gygantick Buildings indeed; but not Worthy the name of Architecture: Witness, what are yet standing at Westminster, Canterbury, Salisbury, Peterborow, Ely, Wells, Beverley, Lincoln, Gloucester, York, Durham, and most Cathedrals and Minsters."

Thus far Evelyn. That Addison had no clearer insight into the nature of architecture will be seen from the 415th "Spectator," where he says:—

"Let anyone reflect on the disposition of mind he finds in himself at his first entrance into the Pantheon at Rome, and how the imagination is filled with something great and amazing; and, at the same time, consider how little, in proportion, he is affected with the inside of a Gothic cathedral, though it be five times larger than the other; which can arise from nothing else but the greatness of the manner in the one, and the meanness in the other."

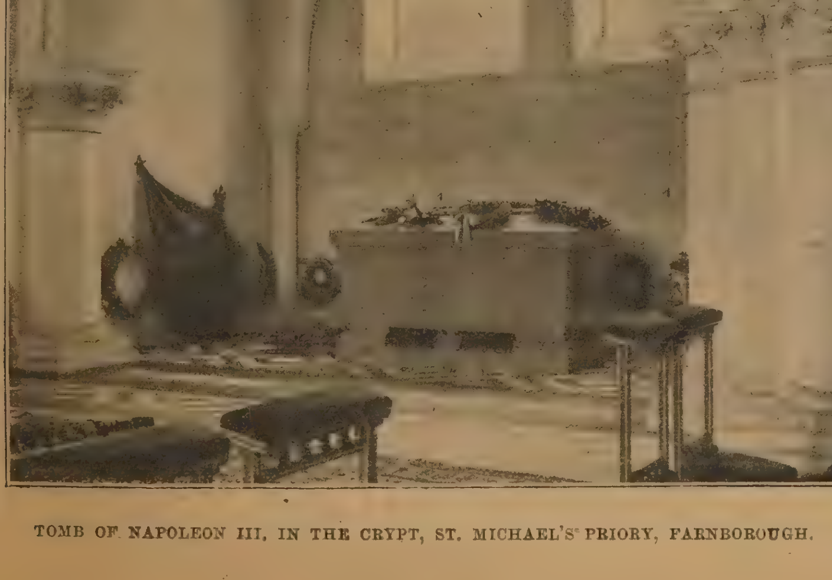
The fact is that architecture to them was, as already said, the Five Orders and nothing more. Architecture, in their opinion, dealt almost exclusively with the external appearance, and they dismiss in a few sentences such considerations as the disposition of rooms. Planning to them meant first and foremost the arrangement of their building in regard to its appearance, not in regard to the functions it had to fulfil. Broadly speaking, a well-designed building is as much a product of evolution as natural scenery or the forms of plants and animals. Natural scenery is almost entirely governed by the geological formation of the district. Plants and animals have assumed their various forms chiefly as the result of the necessities of their growth, which again are dictated by the functions they have to fulfil. And so it is—or ought to be—with a building. Architecture is not only the art of building finely, it is the art of building finely in order to comply with certain specific conditions.

This notion of architecture never occurred to the eighteenth century, brilliant though it was: and so the chief aim of its architects was to dazzle and impress the spectator, not to please and satisfy the indweller. Lord Chesterfield told General Wade, for whom the Earl of Burlington had designed an inconvenient though handsome house in Burlington Street, "if he could not live in it to his ease, he had better take a house over against it and look at it"; a piece of advice by which many a nobleman might have profited.

It has been observed that when people take to writing about art, they have ceased to practice it to perfection. So long as it is spontaneous, its followers need no directions; it carries *them* along, they do not force *it*. But when its natural vitality is spent and its followers are no longer borne unwittingly onwards, then spring up more or less gifted observers, who point out the ancient tracks and show how they may be continued: but unless among them be some who know what kind of force went to the making of the tracks, and can kindle the fire to produce the force, all the most accurate and beautiful drawings of those splendid vestigia will not enable a single one to be repeated.

Ever since the beginning of the fifteenth century—that is, for three hundred years before our period—Europe had been studying the footsteps of the Romans; for more than half that time England had thrown herself into the pursuit: and now the patient efforts of many writers were to be rewarded, and it was to be the aim of every generous patron and every architect of ability to make our English buildings as much like those of Italy as they could. Architectural design was to be a matter of rule and compass. What could be easier? The text-books gave the proportions not only of the modern buildings of Italy—or rather the Orders which adorned them—but also of some ancient ones upon which the sacred eye of Vitruvius himself must have rested.

Macaulay has observed that during the latter part of the seventeenth century and the early part of the eighteenth the heroic couplet was so much in vogue, and was brought to such perfection by constant use, that every poetaster could employ it with as much facility as Pope himself. So it was in architectural design. The rules were so well known that it required no genius to use them—nobody expected any skill in planning—and thus it came that the same dull propriety characterised every building that was erected. Just as in poetry, it is not the polished form of the verses that marks the true poet, but the ideas contained in them; so in architecture, it is not the correct marshalling of columns and the "nice conduct" of entablatures that must be our criterion, but the manner in which the whole building satisfies and expresses the wants which it is supposed to supply. Judged by this standard, how many



TOMB OF NAPOLEON III, IN THE CRYPT, ST. MICHAEL'S PRIORY, FARNBOROUGH.

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* A paper read before the Birmingham Architectural Association on November 22nd, 1901.

of the designs in Campbell's "Vitruvius Britannicus" would come within the category of true architecture? And yet those volumes contain nearly all the larger houses built in the first half of the eighteenth century. One of his designs Campbell introduces thus: "This design of my invention in the Theatrical stile is most humbly dedicated to Tobiah Jenkyn esq." The theatrical style he tells us "admits of more gaiety than is proper either for the Temple or Palatial style"; and in that word *theatrical* lies the key to much of the designing of the period. It is all more or less theatrical, done to impress the beholder; just as in the second half of the century the laying-out of gardens and grounds was contrived with the aim of producing the effects found in the pictures of Claude Lorraine and other landscape painters; down even to the introduction of artificial ruins.

In describing the plan of his house in the theatrical style dedicated to Tobiah Jenkyn esq., Campbell dwells not on the convenience of arrangement, not on the cheerful aspect of the rooms or any special contrivance for the comfort of the inhabitants, or whatever goes to make a house a home, but on the proportions of his principal apartments. "Here," says he, "is the double and single cube, the Hall being 27 × 54. Here is 18 × 27 which is the sesqui altera, and 21 × 27, the sesqui tertia, and you pass gradually from the larger to the lesser": all of which may have satisfied the wants and aspirations of Tobiah Jenkyn esq., but do not compensate his descendants for the absence of those arrangements which make daily life tolerable.

The needs of daily life went but a little way to model the great houses of that time. Architectural grouping, in order to impress the beholder, often led to dividing the mansion into separate blocks, one for the family rooms and State apartments, one for the kitchens and servants, and one for the stables. The kitchen, therefore, would be hundreds of feet off the dining-room, a drawback against which Evelyn warned his readers, "or else" says he, "besides other Inconveniencies, perhaps some of the Dishes may straggle by the way." Sometimes the servants' quarters were located in two detached blocks hundreds of feet apart, balancing the composition of which the family rooms formed the centre, and joined to the latter by open colonnades. How the service of the house could be carried on with the two halves of the staff separated from each other by a five- or ten-minutes' walk is not very clear; but of course the mansions were not built for the servants, but a little for the family itself, more for its grand guests, and most for the casual spectator who was to admire the lordly pile as he passed by.

The servants had to put up with what accommodation they could get. Their hall might be a vaulted underground room lighted only by areas, as at Buckland in Berkshire, and their bedroom windows might look out on to the back of the parapet. The butler might have to sleep in a room without any outside wall and no direct light and air. But in those days servants were merely servants and could hardly expect to be exempt from suffering for architectural effect when their employers were content to suffer as well, though in a less degree. And they must have suffered; for, wholly apart from considerations of bad service, the family were often located in a low basement with all the weight of the State apartments over their heads. Their rooms were not contrived to catch the morning sun or to get a splendid view, or, indeed, for any particular purpose relating especially to them, but they were arranged to fill up the space beneath the great rooms of State, and if they were comfortable it was more by good luck than good management.

The architects of those days were in fact more or less of amateurs, and the kind of architecture in demand was such as amateurs could supply. Pre-eminent among them—at any rate in social position—was the Earl of Burlington; and when we consider this fact for a moment, can we be surprised at the amount of unreal and theatrical design that was produced? Who could expect an earl to concern himself with the niceties of household planning? No wonder that General Wade received that advice from Lord Chesterfield to take a house over against his new mansion and look at it. Yet all through the century Lord Burlington was looked up to as the greatest patron of art that England had ever produced, and especially of architecture. Horace Walpole extols his taste and his ability: he "had every quality of a genius and artist, except envy"; yet withal Walpole cannot disguise from himself that Ripley, who was an architect by occupation (or, as they were called in those days, a surveyor), "in the mechanic part, and in the disposition of apartments and conveniences was superior to the Earl himself."

Pope, of whom Lord Burlington was a patron, satirizes Ripley more than once, but then Ripley did not belong to Pope's faction. Pope himself in one of his epistles points out a way in architecture which no one seems to have followed, not even the nobleman to whom the epistle was addressed. Writing to Lord Burlington, he says:

You show us Rome was glorious, not profuse,
And pompous buildings once were things of use.

And again:

Something there is more needful than Expense,
And something previous ev'n to taste—'tis Sense:
Good sense, which only is the gift of Heav'n,
And tho' no Science, fairly worth the Seven.

Toward the end of the epistle he reverts to the same text:

'Tis Use alone that sanctifies Expense,
And Splendor borrows all her days from Sense.

It is rather amusing that a sermon founded on such an excellent text should contain so much that is at variance with it. Nor can we help smiling that the Earl's work should be supposed to embody the principles here laid down, when we remember poor General Wade's house or the villa at Chiswick, beautiful no doubt in grouping and proportion, but of which Lord Hervey said, "The house was too small to inhabit, and too large to hang to one's watch." Walpole, who records this witticism, has some remarks on the house which are worth repeating. It is "a model of taste," he says, "though not without faults, some of which are occasioned by too strict adherence to rules and symmetry. Such are too many correspondent doors in spaces so contracted; chimnies between windows, and which is worse, windows between chimnies; and vestibules, however beautiful, yet too little secured from the damps of this climate. . . . The ground apartment is rather a diminutive catacomb, than a library in a northern latitude." Then he adds a few sentences which throw some light on one of the motives that actuated the eighteenth century. "The larger court, dignified by picturesque cedars, and the classic scenery of the small court that unites the old and the new house, are more worth seeing than many fragments of ancient grandeur, which our travellers visit under all the dangers attendant on long voyages." There you have it—"the classic scenery," and the "fragments of ancient grandeur," which were to be rivalled by English villas.

It is from the opinions of men who lived in the eighteenth century that we can best gather the motives that underlay their actions, and therefore a further quotation from Walpole may be excused: "It was in this reign" (of George II.), he says, "that architecture resumed all her rights. Noble publications of Palladio, Jones, and the antique recalled her to true principles and correct taste; she found men of genius to execute her rules, and patrons to countenance their labours. She found more, and what Rome could not boast, men of the first rank who contributed to embellish their country by buildings of their own design in the purest style of antique composition." We have seen one of these men of the first rank, Lord Burlington, and what he did. Another was Lord Pembroke, and he is worth singling out because, according to Walpole, "no man had a purer taste in building than Earl Henry, of which he gave a few specimens, besides his work at Wilton." Now his work at Wilton is not easy to assign, for the house is attributed largely to Inigo Jones, and the "theatric bridge," as Walpole calls it, to Morris. But at any rate this bridge is less objectionable than the other "theatric" work of the time, inasmuch as it imposes no special inconvenience on anyone; yet, whether a bridge of this kind is in harmony with English scenery is a debatable question.

Taste, of course, was the great requisite in that age. Lady Teazle endeavoured to acquire it along with other fashionable accomplishments, to her husband's great scorn—what had she, a country-bred girl, to do with elegant expenses and fashion before she married him? "For my part," replies the lady, "I should think you would like to have your wife thought a woman of taste." "Taste!" cries her husband. "Zounds, madam, you had no taste when you married me."

The extravagancies of the second quarter of the eighteenth century sprang from an indulgence in taste apart from consideration of propriety, and it was the often-mentioned Lord Burlington who led to them, partly by his own work and partly by his publication of the designs of Inigo Jones and Palladio's antiquities of Rome. But it only wants a comparison of Inigo Jones's work with that of Burlington and his successors, or a comparison of Wren's with theirs, to see how those two men were really architects, while the others were but amateurs dabbling in what they did not thoroughly understand and into the details of which they scorned to enter.

But while we cannot but feel that in the true essentials of architecture they were sadly lacking, yet we must concede that they produced striking results. One of these fine palaces when it was surrounded by its original gardens must have been remarkably imposing. Take Blenheim, for instance. If we regard it as a home, we must be disappointed, but as the dwelling of a great noble, living in state and surrounded with all its attendant ceremony, receiving other great nobles with their retinues and housing them in more magnificence than comfort—in these respects it has much to claim our commendation. There is much excuse for it in the fact that it was a gift from the nation to its greatest son; it had to be splendid at all costs; yet it did not meet universal appreciation even in those days, as witness the lines of Swift—

'Tis very fine,
But where d'ye sleep or where d'ye dine
I find, by all you have been telling,
That 'tis a house, but not a dwelling.

But when these grandiose ideas were applied to the houses of ordinary noblemen, much as they may have been cherised at the time, the noblemen's descendants find it hard to live in their palaces and hard to maintain them.

There is not time enough on the present occasion to dwell much on the gardens that surrounded these great houses, but they were an acknowledged part of the general design; and now that they have in most cases disappeared, the vast houses, lacking their support, seem more wanting in common-sense than they otherwise would. Among the illustrations in Campbell's "Vitruvius Britannicus," which may be considered as the epitome of the period under discussion, there are not a few showing the lay-outs round the great houses, which were founded partly on Dutch and partly on French examples. It was, however, probably Versailles that set the example to our English nobility, though nothing was done here on so vast a scale. The Duke of Montagu, who was ambassador at the French court for a number of years at the end of the seventeenth century, occupied the first few years of the eighteenth, after his return, in "erecting his seat at Boughton, in Northamptonshire, after the pattern, and as his Dimensions would allow, after the very model of Versailles." It must be admitted that Boughton House is a very plain copy, or rather reminiscence, of Versailles; at the same time, its garden and wildernesses were of unusual magnificence and size, and adorned with numerous statues and a considerable extent of canals and ornamental water enlivened by *jets d'eau* quite in the manner of Versailles as recorded in prints.

The house itself, although of a rather plain and sombre cast, is interesting as an almost unaltered example of an eighteenth-century mansion, simply though richly furnished. Its floors are polished, its walls panelled in large panels surrounded by a bold bolection moulding, the doors are lofty and set in thick walls, the chimney-pieces are simple and massive and surround wide and deeply-recessed open fireplaces. The ceilings are (many of them) by that rather dull painter, Verrio; still, they impart a large amount of character to the place. Here and there is a panelled room, or a fine chimney-piece of a hundred years before, showing that the house was not erected entirely new by the ducal ambassador. The walls are hung with ancient portraits and pictures, and the floors are full of ancient furniture. Through the heavy sashes one looks out on to the undulating park and the long and lofty rows of trees which form part of the celebrated avenues. There are attics innumerable, scattered in every direction, and approached by staircases where the handrail is mitred round the plain square newels, and twisted balusters join it to the swelling string. Through these attics you may go, and down a different staircase, to find yourself in a room that you thought was a furlong off on the other side of the house. Altogether an interesting place, and one that gives a good idea of the haphazard arrangement of a large eighteenth-century house.

At any rate, Boughton House was a home which could be inhabited all the year round—even the State rooms; which is more than can be said of many of its contemporaries. Nevertheless, with all their drawbacks these palaces were stately. The plans look gorgeous on paper, and so do the sections showing the internal decoration. The effect of the places themselves is, perhaps, rather depressing on the ordinary person; the grandeur is a little too obvious—there is no such feeling of homeliness as in the many-panelled rooms of the early seventeenth century; but, when all is said, the fact remains that the architects of the later time had a very definite aim in what they did, and they achieved it.

When we leave the mansions of the nobility and come down to the houses of the squire or the well-to-do merchant, we find ourselves in a much pleasanter atmosphere. They have a quiet dignity about them which is decidedly restful and attractive, especially those of the first quarter of the century. In later times the portico idea became too prevalent, which consisted in affixing to the front of an otherwise plain house some variation of the columned front of an ancient temple. But the earlier houses, with wide corniced eaves, simple horizontal strings dividing the rows of sash windows, and combining with the quoins that emphasize the angles—these will no doubt long continue to form the model for houses of similar use and capacity. It is just a question whether this is quite the type that suits the present age; for our wants seem to grow always more complex and to require a more elastic style than one depending for its effect on strict symmetry and unbroken horizontal lines.

If we cannot take a wholly sympathetic view of the purely architectural work of the eighteenth century—at any rate in its more notable examples—neither can we forget that we are indebted to it for much that is suggestive in the work that embellished the architecture, especially in wood and iron. The ironwork of that period has never been equalled in England, and it lends an air of distinction not only to great houses like Drayton in Northamptonshire, but to little suburban villas at Hampstead. The joiner's work of the time is full of suggestions. The sash window alone was enough to revolutionize architectural treatment; and the far-reaching effects of a mitred moulding are impossible to follow. Through all the changes of two centuries these two facts have remained with us—sash windows and mitred mouldings—and there seems no immediate prospect of their being superseded. The work of the plasterer is not so admirable as that of the joiner. He had become too expert, and was able to perform prodigies of modelling and high relief which finally undid him, and he and his art perished together.

If we are to seek inspiration from the work of the eighteenth century, we shall find it in two directions: First, in the grand schemes of house and garden combined, and in the general grandeur of treatment bestowed upon the great houses of the time. Not that we are to copy either blindly; but it is very desirable to realize how much the house and its surroundings depend upon each other; and equally desirable to learn how a grandeur of manner may be acquired. Secondly, in the sober and simple houses, where the plainness of the general appearance is sometimes unexpectedly broken by the quaint treat-treat of a door or a chimney, and where the joiner's work is full of homely lessons.

It is often from the vernacular architecture of the country that we can get the most useful hints, whereas it is the palatial architecture that gives its stamp to the period and goes to furnish the text-books. The one is for Show first and Use second; the other is for Use first and Show second. The palatial architecture of the eighteenth century was surely given to us more as a warning than as an example; but it is worthy of attention, just as all phases of architecture are which have acquired any hold on public affection; and we are not likely, in view of our present method of study, to fall into that attitude of mind towards any style which Evelyn exhibited towards Gothic. If we bear in mind that architecture must develop from within and not from without, we shall never again become the slaves of a foreign and a dead hand, as our forefathers were in the eighteenth century, but we shall go forward, as we are indeed at the present time going forward, on different paths perhaps and at different rates of speed (sometimes not without sharp divergence of opinion as to the propriety of particular steps), but always towards the same goal—the ennobling of our *alma mater*, the mother-art of the world.

A FRENCHMAN'S GUIDE-BOOK.

BY HENRY ROSE.

QUITE recently we were constantly hearing about the Paris Exhibition of 1900. Now I wish to call attention to a monumental work which deserves to be rescued from oblivion. I refer to a book of about one hundred and sixty pages bearing in gold letters on its neat red cover the following title: "Universal Exhibition, Paris, 1889, Practical Guide," and an illustration of the Eiffel Tower which was to constitute its chief attraction. It was published in Paris for the use of English and American visitors. That the information it contains is remarkable, the following extracts will serve to show.

In the preface we are told that "the period of incubation (brooding) lasted since 1883 till March 1884; when they considered but about a national Exhibition . . . the ambition increased. This ministery thought they would give to this industrial manifestation an international character. They would impose the peace to the whole world." A laudable endeavour which has not yet been realized.

In the "Note of the Editor" we are warned that "for whom who comes there for the first time, it is impossible to direct and recognize one's self without a guide," but in this Practical Guide "we trace him what he has to see . . . still which direction he must follow, which coffees he has to choose to refresh himself." . . . "May the visitor follow us with confidence and he will not have any reason to regret it." On the "First Day" we have "the Exhibition seen in a straight line." "In the first of the perspective are erected the gilded statues of the parts of the world which are hooking the sun rays: at our feet we see the green declivities of the plat-bands, the sheets of the bassins and we hear the bubbling of the Cascades." We are told that "At the centre of each of the palaces of the Fine-Arts and the Liberal-Arts is erected a great dome enamelled with white tone, blue turquoise, yellow and gold of an harmonious effect. Each dome is placed on a wall whose layers in bricks alter with others of the same tone as cupola, and which is supported by consoles crowned by enamelled vessels"—a description which leaves a good deal to the imagination.

Clinging to the hand of our guide, we proceed to the Eiffel Tower, which was erected "in order to attire the stranger." To start with we are told, "It is a pyramid with four bend arcs connected two by two at their inferior parts by arches." On the "second stair-bed" is a "glazed room, quarry of 30 metres aside." The lifts "following the declivity of the jambs . . . deserve the two first platforms," whence "two other lifts withdraw you smoothly till the cupola." If you prefer to walk up, then you should know that "seventeen hundred eighty twelve steps bring you to the top . . . of the highest monument of the globle."

Further on much detailed information is given, after first propounding the following question: "How is the control made? or, to precise more, how do they pay the price of ascension?" We are then bidden to admire the fountain, a "lake in minature in which swans take their sports. Itself has 12 metres of diameter at the level of the wather." Of the figures there represented "Europe under the lines of a woman leaned upon a printing press and seems deeped in profund reflections," and "Australia finally is figured by a woman, buttressed on herself"—a sort of architectural kangaroo—"like an animal not yet tamed ready to throw itself on his prey without waiting to be attacked"; altogether not a happy illustration of the motto, "Advance Australia!"

Then we have the Central Fountain in "a vast French garden at two floors of ground . . . where bloomy baskets put their enchantment," and we are assured that "in the evening at the electric light the impression is chilling."

We are now ready to start on the first walk—"this walk of recognition." "It is the moment or never to walk among the surprising restitution of which M. Garnier made him the promoter . . . resolved to erect an improvisated town," representing the History of the Human Dwelling. "Subdivision 5°" is, "as it can be seen, a kind of architecture which has not its likely in the world . . . One may remark that the lacustre cottage is made with trees cut in two by the carbonisation because men were in want of saws and to come out of it they employed coals in fire." The palace of the children has "pointed roofs surmounted with turnpikes which turn at the wish of the wind." "Enter there with your little family and you will certainly not annoy you." We then have our attention drawn to a very accommodating building with "an aspect half oriental, half quite what you like." A little further on we must have lost ourselves, for "we find us at the Pavillion of Monaco, pretty construction which expresses well the character of this principality of green carpet." On the second day we visit the Palace of the Fine-Arts, the entrance being "adorned with arabescs where brightens the palet of the crokery man." We also enter the gallery devoted to artillery, "where is rolling a humming crowd like an ant-hill in rumour." So we hurry on to hides and leathers. "Here are at first the varnished leathers of all colours of which the genious of the exhibiters has made rose-windows very agreeable to the eye," which shows that we cannot trust him as an exponent of Gothic architecture. The Pavillion of the Press "we make remark quite particularly to the visitor." It was "build with wooden pans. The exterior is of a very fine aspect; the porch is decorated with pans in earthenware." His gift for architectural description is quite rare and always interesting; for instance, the next day we have another building of "an originality quite particular. . . all in wood of fir trees. Its decoration is of a simple style . . . on a green bottom whose tonality is harmonious by black and white rehauts, bronze and gold detach them of the decorative massives of a delicate drawing, borrowed from the ornamental flore." No need to see it after that vivid mental picture. In passing we may note that "England offers likewise pianos in nut wood like they are done there" (perhaps he means Broadwood!), and that the photographic exhibits include "instantly and other apparatus."

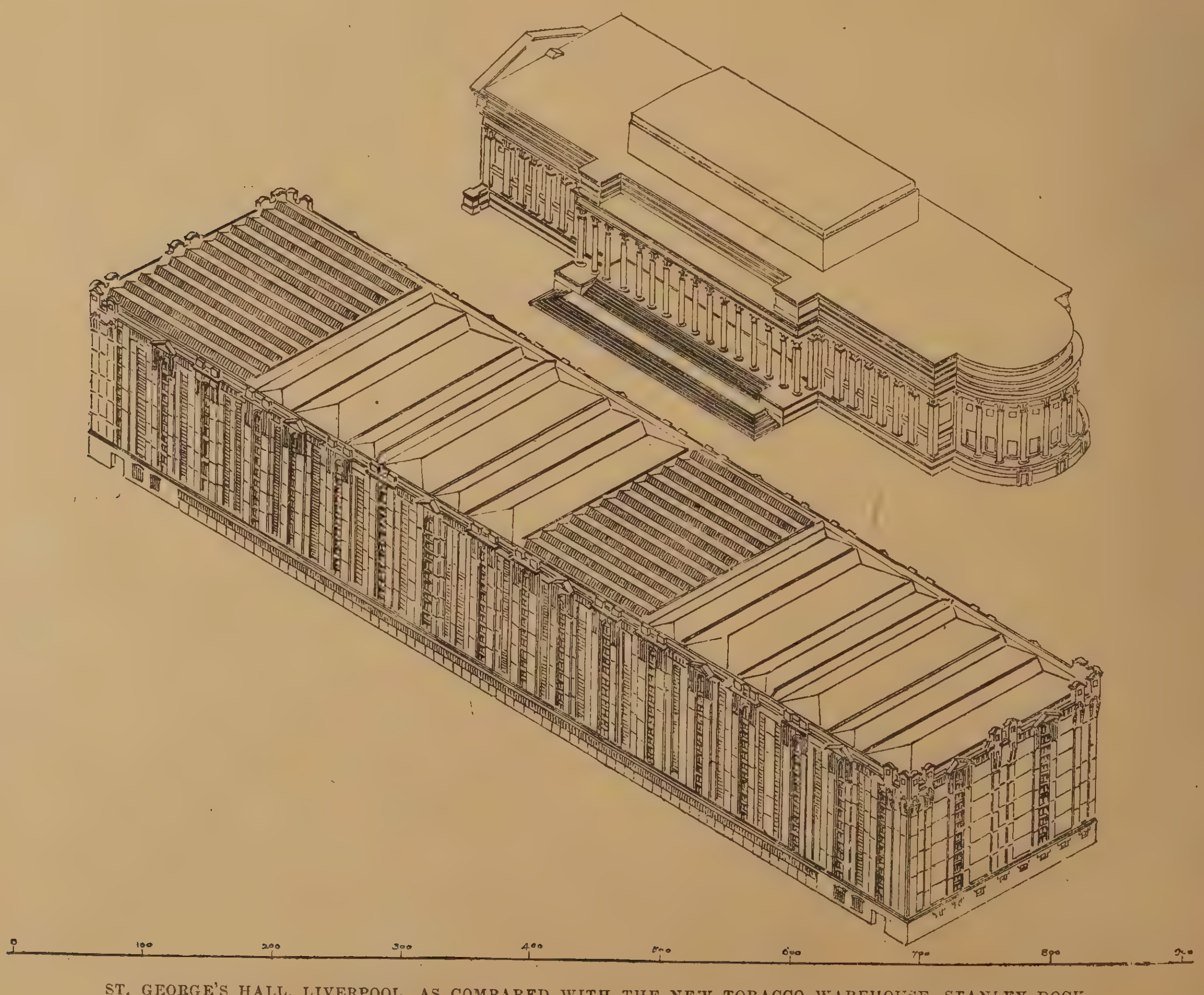
Our guide tells us that "Sweden has no section. The effort was too great. This little country did not wish to tempt it. In revenge, Norway is splendid." He concludes his remarks thus: "Sculpted wooden constructions which have no other imperfection but this one to be a little massive." Cheap French ornaments prompt him to remark: "All these marvellous things are at the reach of the less profligate purses." On wall-papers: "How many pretty things one makes in our days, who would seem devoted to the banality?" But ere we can hazard a solution to the conundrum we have entered the Japanese section. "What to say of it? What to cite? All is unheard, superb, unlikely . . . . furnitures, in lakes in bronze, screams originally painted." A scream with the paint off one might easily have overlooked but for his trained assistance. Next we visit Cairo Street: "When one comes out of the Palace of divers Industries, a little giddy pate and aching of a blustering decoration, the eyes rest them there instantly. Not any art has carried at the same degree of perfection as the arabian the grace of the lines, it appears that the idea of the happy life consisted for it to the indolence in a cool place with exquisit und light shapes around it, it penetrates you with what I don't know of languishness." Having escaped from this enervating neighbourhood we proceed to investigate the electric light. "The lamp Ezmos is of a simple and robust construction and does not demand any special entertaining." On the merits of a certain gas-burner he says: "The gas being no more warm and arriving from up and down, not any deposit nor any obstruction could be produced," a scientific and perfectly convincing explanation. It is interesting to note as we pass to the Javanese village that "one ignores not that Java is the most important of the Dutch colonies in Australia." We next make a tour of the French colonies, where is a Tonkin pavilion with "the roofs formed by several others which follow in graduation according to the typic style of Cochinchina." The self-satisfaction of our guide is complete to the end when he says: "There is finished our common walk in a happy way after six days which we dare believe it did not seem to you long, your curiosity finding a constant aliment at every step which we made you do." We are then taken round certain other shows outside the Exhibition, and his remarks, though much in the same strain, do not seem to need any special comment. The book has the merit of perfect good faith, which it shares with the better known work, "English as she is spoke." The last great Exhibition, as far as I am aware, did not call forth any effort of a like nature, so this work may be considered unique. It was on sale in Paris at the time for 3 francs.

Mr. Edmund William Smith, M.R.A.S., archæological surveyor of the North-Western Provinces and Oudh, died of cholera at Mohinpurwa, Bahraich, on November 21st, in his forty-fourth year. He made elaborate examinations of many architectural remains, repaired several, and published various large illustrated volumes on these remains. A biographical notice will appear in our next issue.

NEW TOBACCO WAREHOUSE AT LIVERPOOL.

LIVERPOOL has gradually acquired the chief interest in the tobacco trade. Many important manufacturers have set themselves down in the city, and it has also become the principal port of entry and the main centre of distribution. To meet the present needs the Mersey Docks and Harbour Board has built an enormous warehouse on a site which was once submerged with water and formed part of the Stanley Dock. The building (which is illustrated in our centre plates this week) was designed and constructed under the supervision of Mr. A. G. Lyster, the chief engineer to the Board, and his assistants. It has been called the largest commercial building in the world. That may not be precisely true, for it is difficult to obtain data, and still more to set up a standard of comparison. But if it be not the largest warehouse in the world there are certainly few to equal it, and it deserves to be described as an illustration of latter-day enterprise in the famous port. Under modern conditions half the space in the Stanley Dock, which was almost square in formation, was useless for the accommodation of shipping, and the engineers decided to cut the dock in half by building a new dock wall down the centre. The same number of vessels can load and unload in the dock to-day, and yet a site has been found for the immense warehouse which now stands there. The southern portion of the dock was filled in, and upon the land so made the warehouse was built. It is no less than 725ft. long, 165ft. wide, and the height above the roadway is 125ft. The foundations were carried through the made land down to the solid rock; and if the height from the foundations to the roof be taken, it is 160ft. The cubical contents of the building are 15,648,951 cub. ft., and the area of the ground is 13,300 sq. yds., or about 2¾ acres. The building is divided into six sections by solid party walls which rise 6ft. above the roof, so that a fire occurring in one section may be kept from spreading to the others. Access from one section to the other is obtained on each floor by means of two double iron fireproof doors, with an air-space of several feet between them, and with these closed it would be relatively easy to localise and control an outbreak of fire. A very complete installation of electric light is provided for all floors and for the ships which may be discharging on to the quay. Many hydraulic hoists have also been provided along the dock front; and within the hoist shafts are carrier pipes for salt and fresh water, which will bear water to the topmost storey from the tanks beneath the roadway into which the salt water has been pumped. Thus it will not be necessary in the event of an outbreak of fire to carry hose from the ground to the roof, but the hose can be affixed to the main on the floor where the fire is. All girders are enclosed in concrete, the supporting pillars have casings of fireclay, and the doors between each section are raised above the floor level, so that water poured into one section would not flood the others, special arrangements having been made to carry it away. Indeed, this building is as interesting in construction as it is monumental in size.

Frithwood House, Northwood, the residence of Mr. E. J. van Wisselings, is situated in a wood on the high ground between Northwood and Watford, and is built of red bricks with old tiles on the roofs. Similar red bricks have been used for the terrace wall, which carries a balustrade of Bath stone. A feature of the design is the garden which has been laid out in a formal manner, a large amount of oak trellis being used for the work. This has been omitted in the illustration on page 337 for the sake of clearness. At the south-west corner of the terrace an old-fashioned brick-paved court has been formed, having a fountain in the centre and an orange-tree at each corner. The house is designed in a domestic type of Renaissance, with an aim at simplicity and comfort. Mr. Mervyn E. Macartney is the architect.



ST. GEORGE'S HALL, LIVERPOOL, AS COMPARED WITH THE NEW TOBACCO WAREHOUSE, STANLEY DOCK.

Bricks and Mortar.

APHORISM FOR THE WEEK.

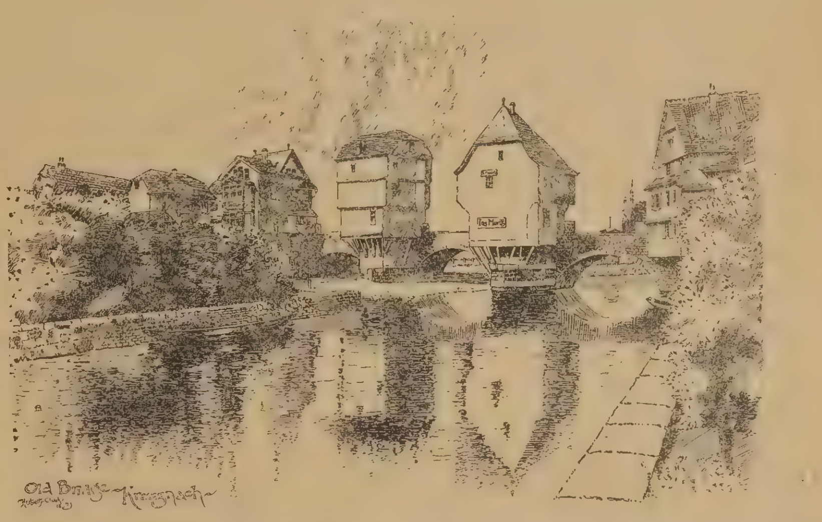
One must have taste to be sensible of the beauties of Grecian architecture: one only wants passions to feel the Gothic. In St. Peter's one is convinced that it was built by great princes: in Westminster Abbey, one thinks not of the builder.—HORACE WALPOLE.

Architectural Shams. MR. E. R. TAYLOR, head-master of the Birmingham School of Art, recently distributed the prizes at Brightelmston School, Birkdale Park, Southport. In his address Mr. Taylor spoke of the value of drawing as a part of education. They learned to draw because it was a help to other studies, and another reason was that they might help to lessen the ugliness of to-day. Until about a century ago, Mr. Taylor said, all things made by man, from buildings to articles for kitchen use, had in them some element of beauty and fitness, and generally so much of rightness and beauty, that the former could not be pulled down without protest, and the latter were gathered into museums. Looking at the two extremes of each they must admit there were distinct lines of demarcation between beauty and ugliness. In architecture the manor-houses and cottages on the Cotswolds, or the half-timber work of Cheshire and Warwickshire, were things of beauty, and in contrast to most of the modern mansions and workmen's cottages. If they admitted that beauty and ugliness were not convertible terms it was worth while to inquire into the cause of so much of the present day ugliness. If they looked at Turkey, India and Japan, they would find that good work continued to be produced in these countries until recently. The work, however, was now contaminated by modern European influences, the same influences which had made our work in this country bad. Japan was the most recent and lamentable instance. It had hurried to adopt Western ideas of life, and its exhibits at the Glasgow Exhibition was the most melancholy sight there. One cause of this present-day ugliness was the attempt to revive old styles. The notion that we could bring to life dead styles was a misuse of the study of history, and yet it still prevailed. Another cause of bad work was the love of shams—not toleration only, but a real love of shams. When he began work in Birmingham, students and others on showing him their work generally reached the climax of praise by stating it was like something it was not. As an instance of this, he cited the treatment of a rubble wall which had a beauty of its own with its irregular mortar joints, giving a texture to secure which in other things great expense was often incurred. This was spoiled by ruling straight mortar joints at all angles to make it less like rubblework. A final cause affecting all the others was the judgment by money value. This tainted all their work. In closing, he advised them in their pursuit of beauty to study simple and right construction, to study old work, to see how it grew, to love Nature, the source of all that was beautiful, and to live simply.

An Architectural Wonder. THUS speaks the reporter on the "Southport Guardian" of the new pier pavilion at Southport, just completed. "This very fine building makes no bid for fame as a specimen of Classical architecture, but, with its circular roof, its turrets and balconical minarets, arranged in Oriental fashion, the claim may be made for it that its beauty is bound to appeal to the eye. It looks a dainty erection of glass and wood, hardly fitted for exposure, more suitable for the fairyland scene of a pantomime, but it really is a structure of solidity and security. From the tips of its four gilded minarets down to the concrete in which rest the girders, the new pier pavilion is solidly, squarely, substantially built—built with an eye to fair weather, but with both eyes open to the possible ravages of gale, storm or fire. When the winds are sending headgear scudding over the roads, swaying vehicles, overturning cabs, wrenching chimney-pots from their mortar foundations, it will be found that the pier pavilion stands unharmed as it stands to-day; and when the tiny spark—that often developes into the raging fire that hisses and burns and crackles, as the few who witnessed the destruction of the former pavilion in the early hours of that fateful morning so well remember—falls in the pier pavilion, it will not find the same congenial timber, and will consequently die. Of course, accidents may happen but so far as lies in the ken of a really competent architect and a really capable builder, the new erection will withstand almost anything. But these precautions are more the concern of those authoritive bodies who represent the public. We delegate the power to rule these things, and then the public concern themselves but with the appearance of things, and that is all right. So to-day, to the right hand of the pier entrance one may see, as in a vision, a handsome thing of blue and gold and crystal—for the pavilion is a miniature Crystal Palace. It seems to be all glass—glass here and there relieved by a lath of wood, and the whole surmounted by a nice-looking wooden roof, roundly shaped, with the corners set off with the golden minarets we always look for in a coloured view of a Turkish town. The design is indeed a worthy one for a palace of pleasure. The whole building rests upon girders fixed on the cantilever principles, and is thus perfectly secure. Not only that, but the principle affords a slight—entirely imperceptible to the ordinary person—spring to the structure, and thus makes it safer than is the average building . . . . . Throughout the building, except where it is here otherwise stated, it may be taken that the wood used is the best pitch-pine . . . . There are a plethora of doors . . . . . The place is ventilated upon the fresh-air principle, the ventilators opening by screw cantilevers operated at the stage side."

Edinburgh's New Asylum. AT a recent meeting of the Edinburgh and District Lunacy Board the clerk gave a report as to the expenditure on and position of the works with regard to Bangour Asylum, and a report by the Lunacy Board on the present plans. From this it appeared that the total amount paid to date was £85,674 19s. 10d. Further, it appeared that the total approximate estimate of the asylum for 600 patients was £263,230, and for 1,000 £376,840. Included in this total was a sum of £16,600 for architects' fees, and £10,000 for measurers' fees, &c. Attached to the report was a memorandum by the Medical Commissioners on the plans of the asylum. This memorandum stated that it appeared to the Commissioners that the plans showed throughout unnecessary costliness in matters of detail. Instances of this were too numerous to be individually specified, but examples were given, such as mullioned windows, crow-stepped gables, string courses, expensive mouldings, and stone balustrades serving no purpose. These seemed out of place in the buildings of a village asylum erected for poor people, and would add nothing to their efficiency as a means of caring for or curing the insane. Special attention was directed to the question of whether such buildings as the homes and supervision homes (of which there would be many) could not be so planned as to provide all the necessary accommodation at less cost. The various departments were criticised individually; and in dealing with the home for thirty-six quiet, chronic or industrial patients (estimated to cost £6,470, or £180 per bed) the Commissioners said it was to be regretted that the home for patients who needed the simplest arrangements for their care and comfort should be so expensive. A special meeting has been convened to discuss the report.

Kreuznach. KREUZNACH was, from the thirteenth to the fifteenth century, the capital of the county of Sponheim. It has now become a watering-place of considerable repute, some thousands of visitors flocking there annually, many of whom take the advantage of the salt-baths, which are particularly beneficial in cases of scrofula and cutaneous diseases. The castle of Kauzenberg, the ancient seat of the family of Sponheim, situated upon the summit at the north-west side of the town, commands a fine view of the valley of the Nähe from Rheingrafenstein to Bingen. A lion hewn in stone, brought from Schloss Dhami, the seat of a branch of the Wildgrafen and Rheingrafen, commemorates the gallant deed of a butcher of Kreuznach, one Michael Mort, who in 1279 sacrificed his life to save that of his prince, Johann von Sponheim, in a battle against Archbishop Werner, of Mayence. One of the most picturesque objects of interest is perhaps the old stone bridge, which unites the three different portions of the town, upon the buttresses of which several quaint old houses are built, illustrated on this page. Kreuznach is the birthplace and residence of the Cauers, who have made a world-renowned reputation as sculptors of considerable talent.


Old Bridge—Kreuznach—

Southport's Victoria Memorial. MR. GEORGE FRAMPTON, A.R.A., who has been commissioned to execute a statue of Queen Victoria for Southport, has prepared an interesting model for the inspection of the councillors of that borough. The Southport authorities have suggested a site for the statue which does not strike Mr. Frampton as the most suitable, and he has proposed an alternative scheme. The sculptor suggests that the statue shall be placed in the centre of an open space (approximately circular) in the midst of the gardens that border one side of the wide and important thoroughfare known as Lord Street, and he proposes, if the Town Council approves, to arrange this open space according to the plan indicated in his model. As a rule the sculptor—in England, at all events—has to make his monument fit in as best it can with all its all-too-often uncongenial surroundings, but according to the plan in Mr. Frampton's model Queen Victoria's statue would form the centre and keynote of a complete and harmonious scheme. The statue, with the seats round its base, is shown in the model standing in the centre of a circus about 180ft. in diameter. Round the outer rim of this space runs a wide pavement composed of sections of red bricks and white stone, and adorned with seats and lamps designed to effect the general harmony. Trees have an important part in the scheme, and their arrangement has been carefully planned in the model, every detail of which has been carried out with thoroughness in plaster and wax.

Yarmouth Old Town Wall. In order to widen Rampart Road and give a better and safer approach to the Northgate Board Schools, the Great Yarmouth Town Council has arranged with the charity trustees to acquire a strip of land that is bounded by part of the town wall; and to carry out its scheme of improvement the Council has assented to the demolition of that part of the old town wall which runs parallel with Rampart Road. This proposal is considered by the local archæologists a piece of gross vandalism. This wall was in process of building when the plague known as the Black Death ravaged the town in 1349. That visitation caused delay in its construction, and the wall was not completed till 1396. The old North Gates, according to tradition, were built by the persons who made money by the removal and the burial of the bodies of those who died from the Black Death. Dr. John Bately says that the portion threatened with destruction is in a very good state, faced with black flints, 4ft. wide at the top, about 8ft. in width at the foundation, and clear of any buildings. It is the longest stretch of the old town wall in existence that is not covered by any buildings, and as intact as any portion remaining in the borough. On the other hand, the North Ward representatives in the Council have declared that the wall is a dangerous and crumbling ruin, obstructing the passage both of air and light, constituting an eyesore and a nuisance, that they demanded that it should be removed. Dr. Bately says Yarmouth town wall is, with the exception of a point at St. Peter's Church, entire from end to end, and there are few towns of which this can be said. The only breaches in the wall are where the St. Nicholas Gate, the North and South Gates, and others, were removed, with the towers that enclosed the gates. Part of the wall has gone in the churchyard, but even there the foundations remain, and it is possible to view the wall from end to end. It is probable the matter will be brought before the Norfolk and Norwich Archæological Society.

The Emperor on Modern German Sculpture. At a banquet in Berlin last Wednesday, given in honour of the unveiling of the last of the historical groups in the Sieges Allee, the monument of the Elector John George, Emperor William made a speech dealing with modern German sculpture. His Majesty had invited all the sculptors to whom he had entrusted the design and execution of the Hohenzollern statues, as well as the Curators of the Berlin Museums and other guests. For the execution of his conception, his Majesty said he had put aside the plan of Committees of Selection and public competitions, and had adopted the direct method of commissioning artists in accordance with the approved manner of Classical times; and with the help of Reinhold Begas he had succeeded in getting together in Berlin a staff of artists capable of the work in hand. The utmost freedom had been given them, and the experiment had been successful. The Berlin School of Sculpture stood on a plane of splendour such as had scarcely been seen in the time of the Renaissance. Then continuing, the Emperor said: "Our sculpture stands before us to-day pure from modern tendencies. Do not give up the great principles of old. Art which thrusts itself beyond æsthetic laws is workshop art. The true artist does not require to be cried up on the market-place. The great masters of Greece, Italy and the Renaissance knew nothing of present-day newspaper advertisement. They worked as God gave them inspiration, and let people chatter as they pleased. The perception of the ugly and of the beautiful is the possession of every man. It is for the cultivation of this feeling in the nation that I need you. I thank you for having accomplished such work in the Sieges Allee. The impression which it exercises on strangers is stupendous. On all hands a deep respect for German sculpture is conspicuous."

Engineering Notes.

A New Pier Pavilion at Southport has been erected from plans by Mr. R. F. Freeman, of Bolton, by Messrs. W. H. Peters & Sons, builders, of Rochdale.

The Transporter Bridge at Newport, Mon.—Mr. Haynes, the borough engineer, will be associated with M. Arnodin in the construction of this bridge, which is estimated to cost £64,000.

The "Century" Buildings, St. Annes-on-the-Sea, have lately been fitted with the latest improved hot-water heating apparatus by Messrs. John King, Ltd., Liverpool, employing their latest improved Rahnee radiators and "Rex" radiator valves.

Electric Tramways at Newcastle.—The first car of the new overhead electric system of tramways in Newcastle was set running last week. The first rail was laid in May, 1900, and the system was estimated to cost £400,000, but the contemplated outlay has been more than doubled. There are twenty miles of double track, extending to all the suburbs. The tramways have been constructed under the direction of Mr. Le Rossignol, who has been appointed manager for the Corporation, to which the system belongs.

The Electric Lighting Boards Co. announce that their French representatives were able at three days' notice to instal the entire electric lighting system of the numerous stalls at the great Automobile Exhibition in the Grand Palais of the Champs Elysées, the number of lights applied in this limited time being no less than six thousand. This achievement is a remarkable one and beats any French time record, even including the company's rapid installations at Compiègne on the occasion of the Czar's visit.

"The Young Engineer and Amateur Carpenter."—We have received the second number of this new publication, which is issued from 56, Ludgate Hill, E.C., price 4d., monthly. The chief article is on the "Tuppeny" Tube, while other articles deal with pneumatic tools, electric cells (by Mr. Bottone), lathes, a cylinder electrical machine, a simple telephone, and home carpentry. The paper has an attractive appearance, and should meet with a generous approval among students and amateurs; but it is to be regretted that such an atrocious design for an overmantel as that shown on p. 65—just the kind of thing one sees in a cheap-Jack's saleroom—should be given as an example of good work.

The New York Tunnel.—It is asserted that the Pennsylvania Railway Company has nearly completed arrangements for the construction of a tunnel under New York City and under the East River to Long Island for the purpose of bringing Transatlantic passengers and freight landed at the eastern extremity of Long Island direct into New York and across the city ready for transference to the company's main lines without a change. It is said that when the tunnel is completed and proper docking facilities are constructed on Long Island the American line, which is closely connected with the Pennsylvania Railway, will stop their boats at Long Island. This will result in a saving of time, which is expected to force the British and German lines to do likewise. The ordinary Transatlantic journey will be reduced from Fire Island to New York to from four to six hours, and in case of night arrivals there will be a reduction of at least half a day.

A Scholarship for Iron and Steel Research.—A research scholarship or scholarships, of such value as may appear expedient to the Council of the Iron and Steel Institute from time to time, founded by Mr. Andrew Carnegie (vice-president), who has presented to the Iron and Steel Institute sixty-four one-thousand-dollar Pittsburg, Bessemer and Lake Erie Railroad Company 5 per cent. debenture bonds for the purpose, will be awarded annually, irrespective of sex or nationality, on the recommendation of the Council of the Institute. Candidates, who must be under thirty-five years of age, must apply on a special form before the end of March to the secretary of the Institute. The object of this scheme of scholarships is not to facilitate ordinary collegiate studies, but to enable students who have passed through a college curriculum or have been trained in industria establishments to conduct researches in the metallurgy of iron and steel and allied subjects with the view of aiding its advance or its application to industry. There is no restriction as to the place of research which may be selected, whether university, technical school, or works, provided it be properly equipped for the prosecution of metallurgical investigations. The appointment to a scholarship will be for one year, but the Council may at their discretion renew the scholarship for a further period instead of proceeding to a new election. The results of the research are to be communicated to the Iron and Steel Institute in the form of a paper to be submitted to the annual general meeting of members; and if the Council consider the paper to be of sufficient merit, the Andrew Carnegie Gold Medal shall be awarded to its author. Should the paper in any year not be of sufficient merit, the medal will not be awarded in that year.

BRICKLAYING AND TRADE-UNIONISM.

THE UNIONS REPLY.

The Management Committee of the General Federation of Trade Unions (including the Amalgamated Society of Engineers and the Navvies, Builders' Labourers' and General Labourers' Union) have published in the "Times" a "reply" to the statements made against them.

They deny that the practices alleged form any part of trade-unionism. "Trade-unionism seeks to promote the interests of labour by substituting collective for individual bargaining in the disposal of the labour of its members. It seeks to fix certain standard minimum conditions in regard to wages and hours, but it does not seek to beat all down to that level. As a matter of fact, it puts no embargo upon its members who may be inclined to get beyond the minimum conditions by special skill, aptitude or diligence. In all trade unions there are men who have risen from the ranks of manual workers and are filling responsible positions in life as architects, consulting engineers, manufacturers and publicists. Trade-unionism has rendered immense service to the community, inasmuch as it has prevented whole masses of workers being pressed down below the level of industrial efficiency.

"True, the unions oppose sweating of labour by unscrupulous employers, and resent their members being goaded to abnormal exertion beyond their strength and inconsistent with health and permanent efficiency.

"A great classic example of 'free labour' in this country is that of the agricultural labourer. The 'free' unorganised agriculturist has been for generations ground between the upper millstone of landlordism and the nether millstone of obsolete methods of production directly contributed to by his dependence and consequent cheapness of his labour. He has been reduced thereby to a condition of physical and mental starvation, yet agriculture languishes and no one gains as a result of the labourer's degradation. On the other hand, in such trades as engineering, shipbuilding, mining, &c., labour has by organization won for itself better conditions in regard to wages and hours, which betterment has led to the stimulation of invention and the introduction of machinery, with immense advantage to all engaged, as well as to the community. The statement, therefore, that the unions have prevented the introduction of labour-saving machinery or appliances is not only not true, but absolutely the reverse of the truth."

At the annual dinner of the Newcastle, Gateshead and District Building Trade Employers Association held at Newcastle on Wednesday last, Alderman Rankin, of Sunderland, said that in their district they were the first to put their finger on the evil of restricted labour. In going back through their books they found that six or seven years ago the men did at least a third more work than they were doing now. The men's associations said they had nothing of the sort on their books, but who would expect them to record such a resolution?

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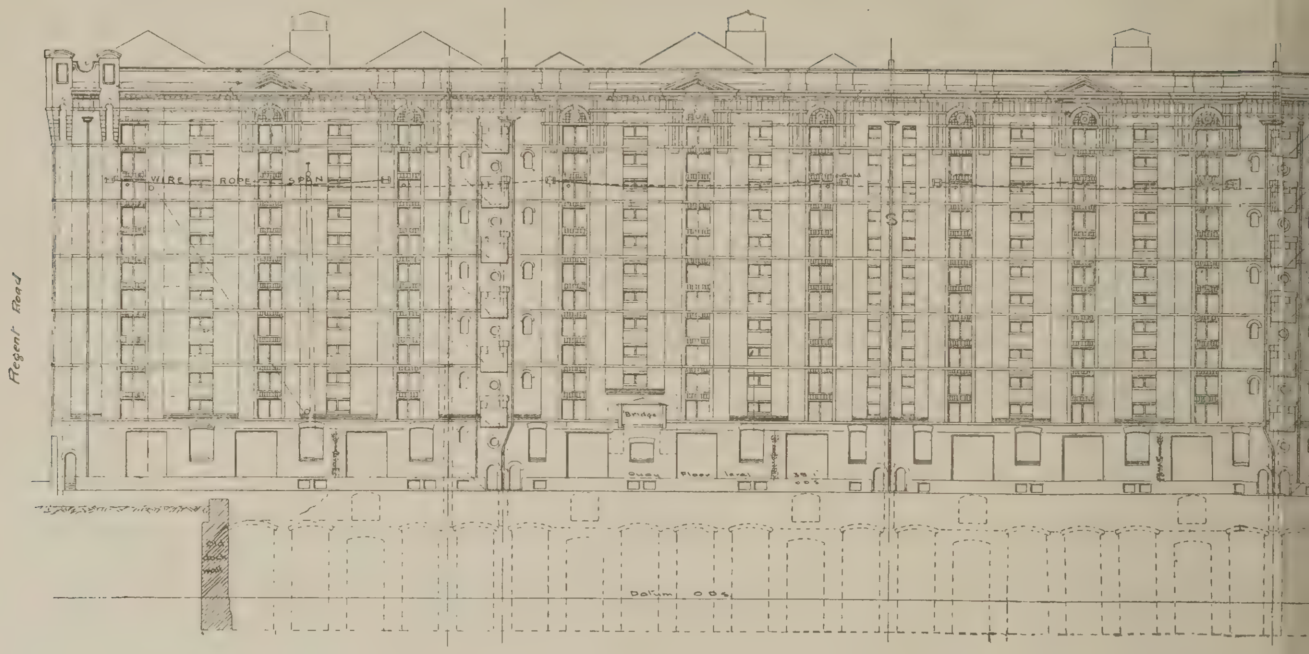
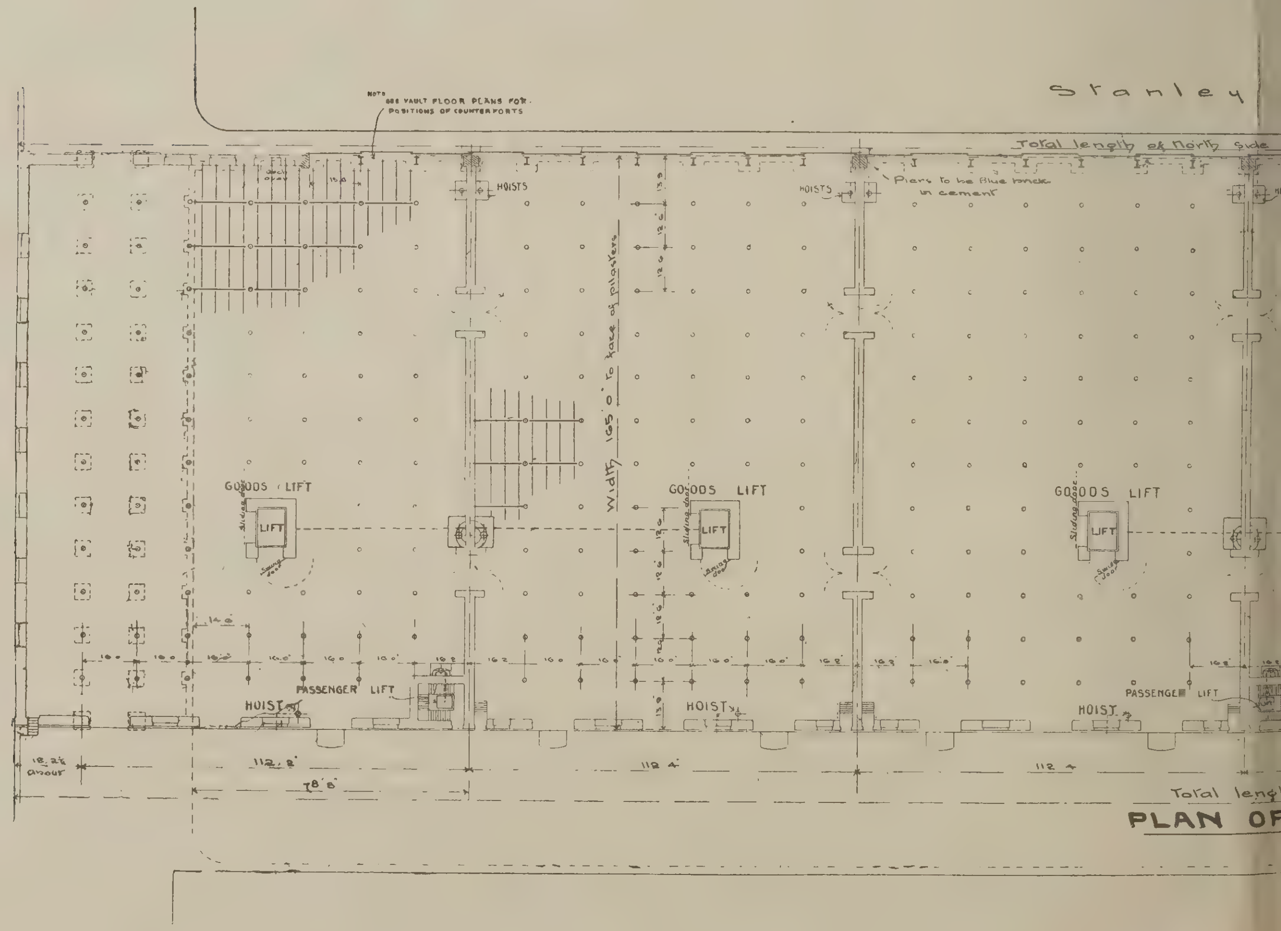
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, December 25th, 1901.

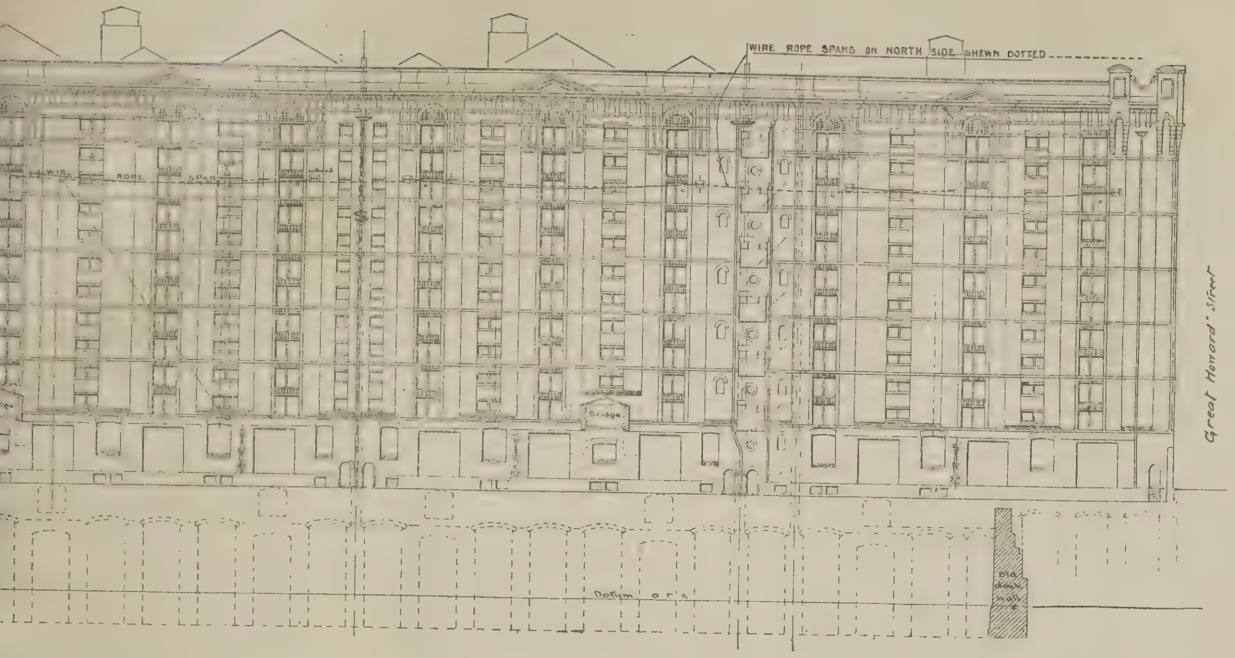


SOUTH

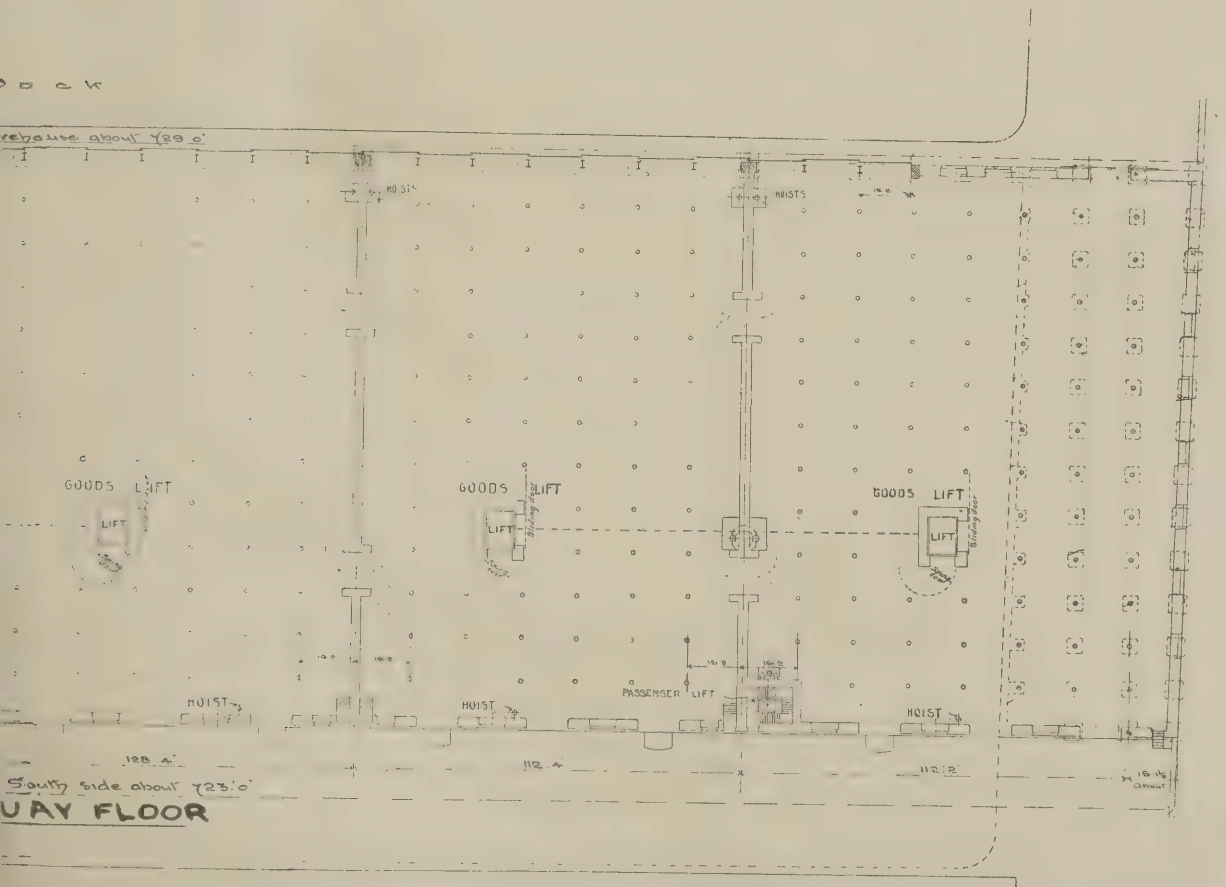

Stanley
NOTE SEE VAULT FLOOR PLANS FOR POSITIONS OF COUNTERFORTS
Total length of North side
HOISTS
Piers to be Blue brick in cement
Width 165' 0" to face of pilasters
GOODS LIFT
LIFT
PASSENGER LIFT
HOIST
18.2½ about
112.8"
78'8"
112 4"
112 4
Total leng

PLAN OF

NEW TOBACCO WAREHOUSE, STANLEY DOCK, LIVERPOOL.



EVATION



UAY FLOOR

LYSTER, Chief Engineer to the Mersey Docks and Harbour Board.

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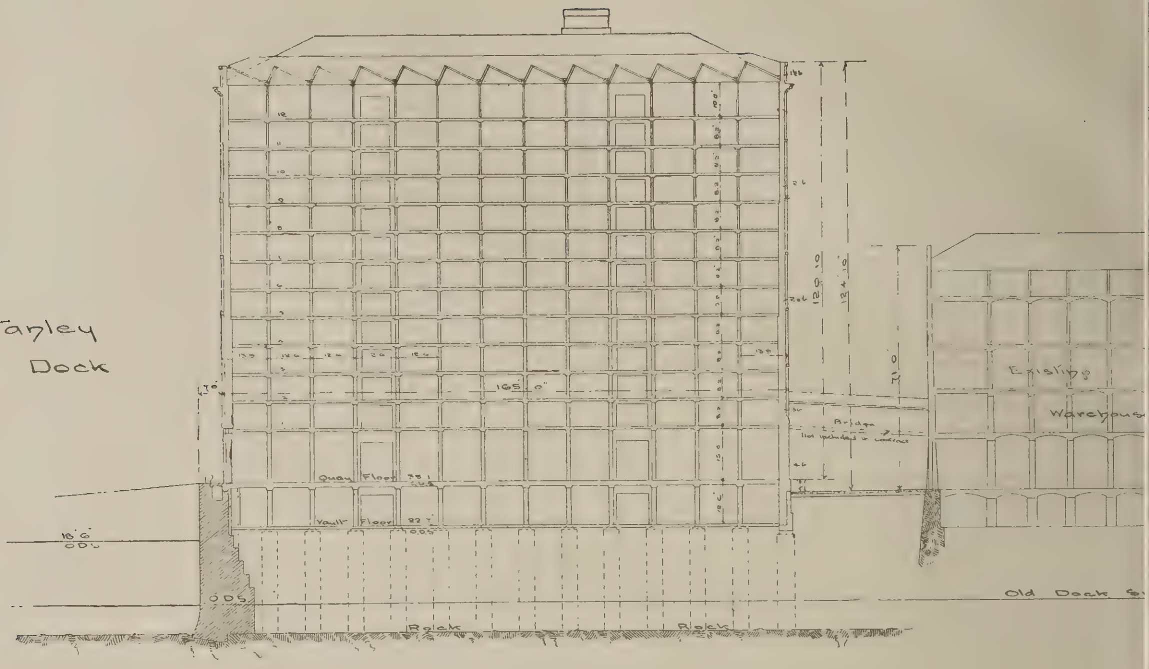
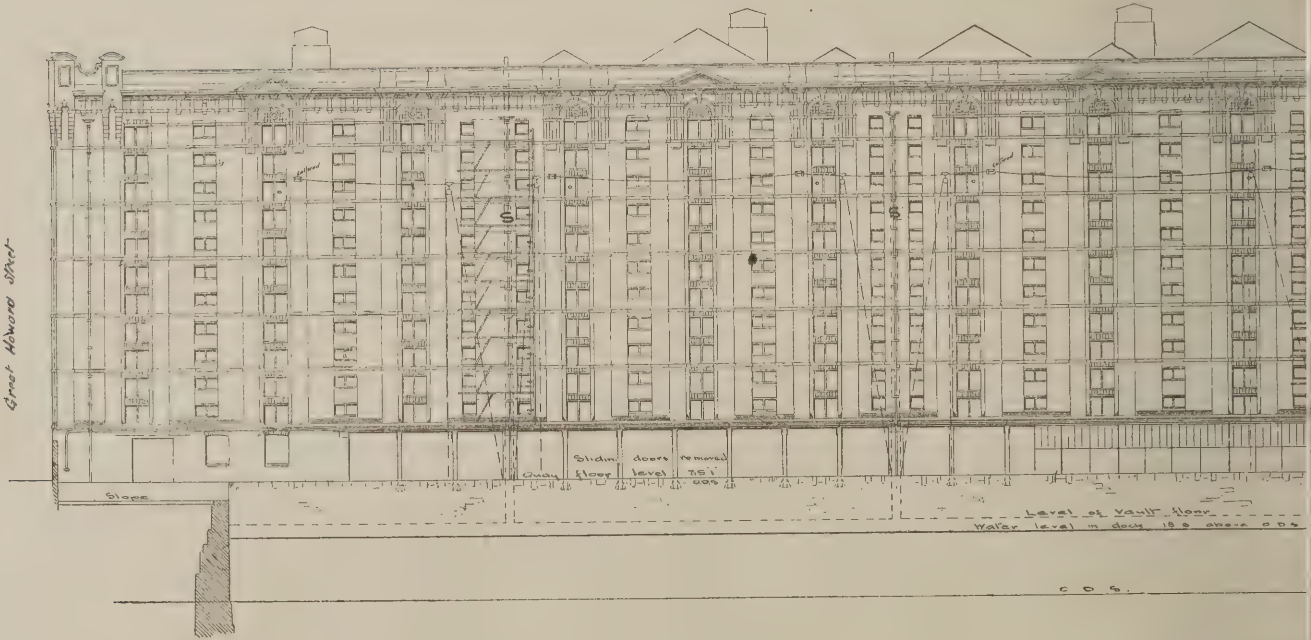
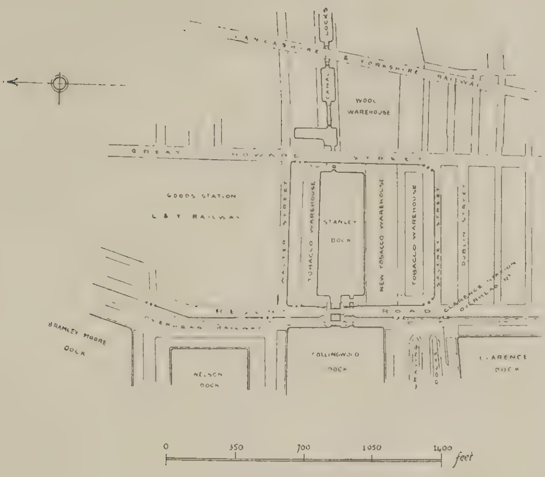


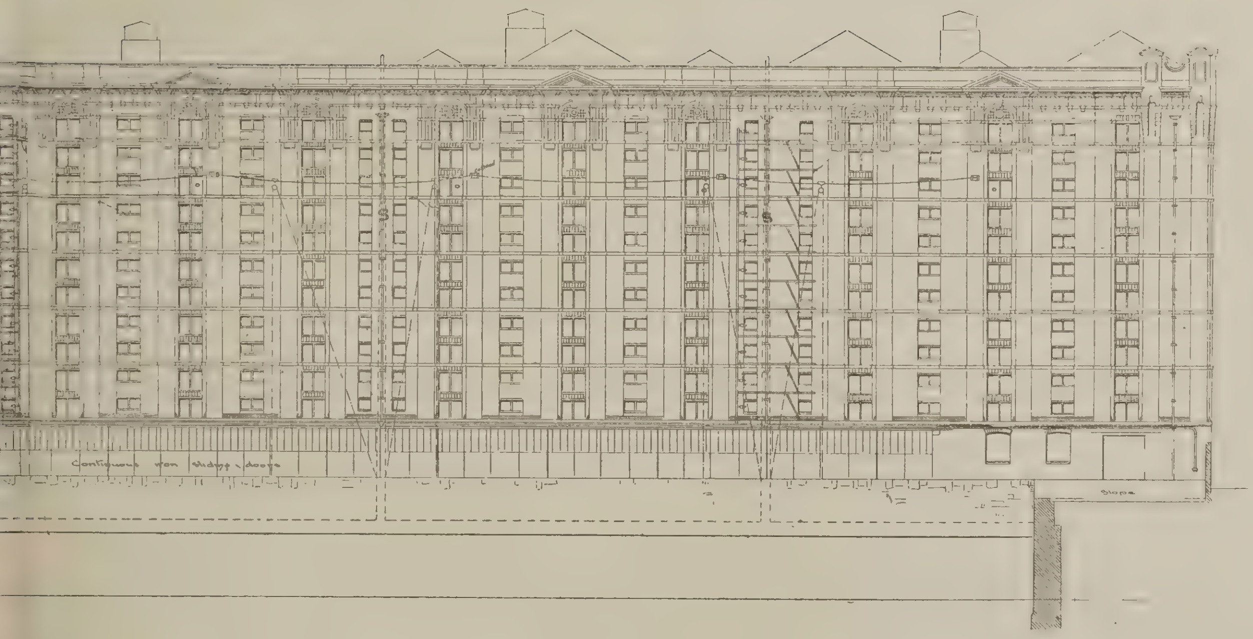
CROSS SECTION



ELEVATION

NEW TOBACCO WAREHOUSE, STANLEY DOCK, LIVERPOOL.





DOCK

Note. Windows marked thus o" to be wrot iron, hinged to open for access to cathead inspection platform

Down pipes marked S refer to the detail drawing

G. LYSTER, Chief Engineer to the Mersey Docks and Harbour Board.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Building against a Party Wall.

BISHOP AUCKLAND.—INTERESTED writes: "A half-brick wall divides the yards belonging respectively to A. and B. In the deeds of A.'s house no mention is made of the matter. B. built both houses and sold the one occupied by A. to him. B. now proposes to build a bakery, using the half-brick wall, but without asking A.'s permission. Is the wall in question a party wall?"

You should be able to ascertain whether the dividing wall between your yard and that of your neighbour is a party wall or not from the measurements and boundaries set out in the lease. In the circumstances stated, and assuming the deeds to afford no assistance, I am of the opinion that the law would presume the half-brick and the gable wall to be party walls. However, the question as to whether or not the wall is a party wall is one of small importance to you, because even granting it to be such, or even the sole property of the adjoining owner, yet you are perfectly entitled to build up against it any structure you like so long as you do not injure it, and subject, of course, to the remote possibility of the adjoining owner at any time removing the support of his wall in the event of his being the sole owner of it. The structure you contemplate is a very small one; and, save on the score of nuisance—*e.g.*, smoke—or by reason of restrictive covenants in your lease, I see no reason why you cannot build it in the manner you propose.

W. J-R.

The Building Trade.

NEWCASTLE-ON-TYNE.—TYNEDALE writes: "In which towns or districts in the country is the building trade supposed to be particularly active?"

The building trade throughout the country is depressed; and although many small urban localities are normal, or developing normally, the supply is fully equal to cope with the demand. Just at present the trade is particularly idle, and will be for some months, till the cold weather is over. The North is perhaps more depressed than the South.

Joinery Instructor under London School Board.

MANOR PARK.—INSTRUCTOR writes: "I am a joiner by trade and wish to be appointed under the London School Board as instructor. Kindly state what certificates I should need and what are the hours, remuneration, &c."

The conditions of appointment for instructor and assistant instructor in woodwork under the London School Board are: that the candidates must have passed the examination in Science Subject First-class No. 1 (Practical Plane and Solid Geometry), and obtained the full "D" certificate or equivalent, namely, Science Subject No. 2 (Machine Construction and Drawing) or Science Subject No. 3 (Building Construction). The salary for assistants is £80 per annum, with an annual increase of £5 to a maximum of £100. Instructors, £100 per annum, with annual increase of £5 to £155. Hours, 27½ per week, some of which may be in the evenings. The candidate must be thoroughly competent to teach woodwork—the certificate of the City and Guilds of London Institute, or a certificate in Sloyd will be accepted.

W. E. C.

Thickness of Masonry Dam.

MIDLANDS.—A BEGINNER writes: "Would the enclosed section (not reproduced) of a wall built in rough masonry with lime mortar be too much for a dam enclosing 25 yds. sq. of water averaging 6ft. deep?"

The surface area of the water enclosed by the dam has no influence upon the thickness of the wall, which is solely determined by the nature of the material and the depth of water to be sustained. Cement-mortar only should be used in building the masonry wall forming the dam, but if the work is already started and lime mortar has been used the inside face should be both built and rendered in cement. Taking the depth of water to be 6ft., the wall must be carried high enough above to prevent any wash over the top in high winds, say at least 18in. above the top water-level. The thickness at the top should be, say, 2ft. to 2ft. 6in., and the thickness at a depth of 6ft. below the surface of the water would vary according to the batter of the sides. If the side next the water were vertical and the other side battered (as Fig. 1) the thickness should be 4ft. 6in. If the side next the water were battered and the other side vertical (as Fig. 2) the thickness should be 7ft. If both sides were equally battered (as Fig. 3) the thickness should be 5ft. 6in. The nature of the foundation is not stated. The wall should be carried down to solid rock if possible, and every precaution taken to prevent leakage.

HENRY ADAMS.

Agreement not to Practice.

LONDON, S.W.—W. C. W. writes (but does not give his name) or address, which is quite contrary to our requirements): "When I entered a firm consisting of two brothers I signed an agreement not to start business on my own account within a certain radius. They have now dissolved partnership, the younger brother carrying on the business. Does the agreement now hold good, or is it void?"

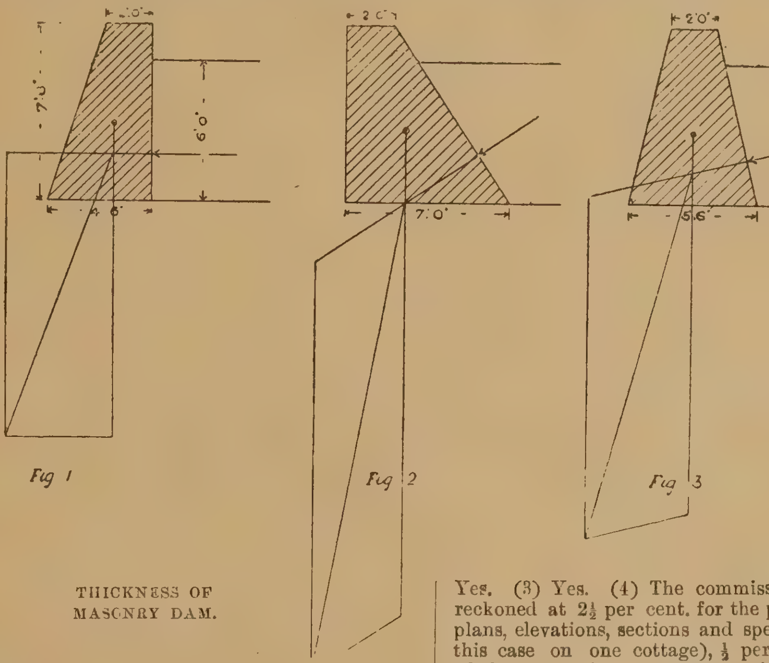

Fig 1 Fig 2 Fig 3

THICKNESS OF MASONRY DAM.

The agreement does not bind you. It has been several times decided that such an agreement made by employers with their servants when seeking a situation are void when out of their employ. Where, however, such agreements are made for monetary considerations, as where an architect sells his practice in a certain district, they are recognised as binding.

Liability for Damage to Weather-Cock.

GLOS.—STAPLETON writes: "The weather-cock on the turret of a new hotel has blown over about 5in. The contractor refuses to put it right, contending that he is not liable, as the weather-cock was selected by the architect and fixed according to his instructions. The conditions of the contract were those issued by the R.I.B.A., and include the usual clause for making good any defects, shrinkage or other faults which may appear within twelve months from the completion of the building. Is the contractor liable?"

If the contractor did not perform his part of the work in a proper manner, he is liable; if the architect was at fault, he is liable; and if the failure was due to neither, but accidental, neither is responsible, and the owner will have to repair the damage at his own expense.

Architect's Commission.

DUBLIN.—SUBSCRIBER writes: "An architect prepared some plans for cottages. As the local Town Commissioners were borrowing money to build them under the Labourers' Dwellings Act, he agreed to a remuneration of 2½ per cent. No legal agreement was made, but the matter was entered in the minute-book and signed by the chairman. Two years elapsed before the work was begun, the architect having in the meantime removed his office to a neighbouring town. When the work was well in hand the Commissioners received an intimation from the architect that 'owing to extra trouble, &c., for supervision, I could not accept less than 5 per cent. as my remuneration fee.' (1) Can the architect make any charge for plans, &c., in view of the fact that he has violated his own agreement? (2) Could he be compelled by law to fulfil his agreement? (3) If another architect were employed to superintend the work, would he be entitled to enforce the 'conditions of contract' signed by the former architect? (4) Is 2½ per cent. insufficient for this class of work—about twenty cottages are to be erected from one set of drawings?"

(1) The agreement, though verbal, is a legal one, and the architect can only claim what was agreed upon at first. He could move to Jerusalem if he liked after the agreement was made, but his clients have the right to insist upon his completing this part of the contract without extra payment for travelling expenses, &c. (2) Yes. (3) Yes. (4) The commission is usually reckoned at 2½ per cent. for the preparation of plans, elevations, sections and specifications (in this case on one cottage), ½ per cent. on the whole twenty for procuring tenders, and 2 per cent. on the whole twenty for supervision, &c. Travelling and out-of-pocket expenses are paid in addition.

Alabasters.

CARDIFF.—IONIC writes: "Where can I procure a good quality alabaster and spars in variety of colour?"

There are two kinds of alabaster, calcareous and gypseous. True or Oriental alabaster is a carbonate of lime, differing from marble in its formation, being produced by precipitation. The onyx marble of Mexico, largely used for decorative purposes, is an alabaster, and Algerian is well known. The name alabaster has also been given to massive gypsum, a hydrous sulphate of calcium, a stone much softer than calcareous alabaster; when highly crystalline and transparent, it is called Selenite, and when fibrous satin spar. The chief varieties of true alabaster are as follows:—Bianco; Cotognino; Giaccione; Onice; Nuvole; Occhi; Tartaruga; Sadonico; Pecorella; Fortezzino; Fiorito; Rosa; Dorato; and Palombara, from the foot of Monte Gennaro, near Rome; these names except the last refer to either the colours or their formation. All varieties of alabaster, marble and similar ornamental stones can be obtained through Messrs. Farmer & Brindley, of 63, Westminster Bridge Road, S.W.

New Patents.

These patents are open to opposition until January 27th, 1902.

1900.—Road-Roller Scarifier.—22,537. B. Asplen, 'Beverley," Southall. This scarifier may be fitted to the road roller or traction engine, or it may be mounted on a separate carriage. It consists of an outer and an inner casing of cast-iron or steel. The latter has a series of scarifying teeth at its lower end which can be adjusted by a central screw.

Calculating Slide Rules.—23,256. A. Forster, Bedeburn Park Road, Cowes, I.W. This is an engineering slide rule which combines scales so that "mean pressure," "diagram factor," "cylinder ratios," and other calculations, can be made with ease.

Self-locking Bolts.—22,938. F. F. Evans, 17, Coltsgate Hill, Ripon. This bolt, which is intended for joining two or more pieces of wood together (as in a roof), is hollow for the greater portion of its length, and is threaded inside and out. When two parts are to be joined, a hole is made in one, and a threaded cone is driven in. The bolt is then passed through the other part and screwed on to the cone, by which it is expanded and held fast. By turning it in the opposite direction, both the bolt and the cone can be removed.

1901.—Guard for Wood-working Machinery.—59. T., R. & W. Lees, all of Park Foundry, Hollinwood, near Oldham. The guard for covering the rotary cutters is fixed at the end of a swinging lever, which normally tends to descend. A disc is also attached to this lever, and rests on the wood whilst it is being worked. The parts are very neatly arranged.

Heating Buildings by Steam.—1,272. J. N. Russell, 109, High Road, Chiswick, London, W. Combined with the air-line services from the mains and radiators are valves so arranged that when the steam inlet is shut the air-line connection is open, and, *vice versa*, when the air-line connection is closed to the degree necessary to prevent waste of steam, the steam inlet is open. The invention is based essentially on the maintenance of a partial vacuum.

Wood-planing Machines.—2,309. J. & D. Sagar, Canal Works, Halifax. This invention relates to an attachment (for the feeding end of the machine) for use in pattern stripping, or planing boards to any angle, or wedge-shaped, so that any desired draft is secured with a minimum of adjustment, and without interfering with the usual parts of the machine.

The following specifications were published on Saturday last, and are open to opposition until February 4th, 1902.

1900.—19,367, Turner, traps for water-closets, sewers, &c. 22,139, Hatschek, slabs of artificial stone. 22,527, McGibbon, ventilating churches and other buildings. 22,666, Simpson & Thomlinson, automatically operating ventilators according to the temperature. 22,788, Doulton & Morris, joints for earthenware pipes or conduits. 23,718, Hewitt, cement kilns and drying chambers.

1901.—804, Lovering, draught and weather excluders for doors. 1,250, Harrison, fixing handles to doors, &c., with screws. 1,251, Walton, adjustable strut for trenching. 1,273, Russell, heating buildings by steam. 1,327, Collins, drain-testing appliances. 1,420, Lewis, window sashes and frames. 1,693, Roovers, water heaters for baths. 1,920, Moore, casement windows. 2,252, Hopkinson, J. Hopkinson & Co., Ltd., & Lowis, valve seats. 2,628, Russell, jib cranes. 2,800 Harvey, sheet-metal knobs and terminals. 3,004, Tourtel, locks. 3,674, Penotti, shower baths. 5,423, Leibow & Maitinsky, steam-heating apparatus. 7,670, Westley & Slater, draught, rain and dust excluder. 12,498, Scott, street-cleansing or scavenging apparatus. 17,555, Francke, non-conducting material for steam pipes, &c. 18,612, Lovekin, tools for expanding and flanging the ends of pipes. 20,060, Castle, shower-bath apparatus. 20,439, Dachsel & Finke, stench-traps. 20,891, Höyer-Ellefsen, fireproof floors.

Law Cases.

Remarkable Case of Libel against two Birmingham Architects.—The case of *Charles & Forbes* v. *Lloyd* was heard last week in the Nisi Prius Court at the Birmingham Assizes. This was an action for libel brought by Edward John Charles and James Edward Forbes, architects, carrying on business together, against Frederick William Lloyd, another Birmingham architect. Briefly, the allegation against the plaintiffs was that they dishonestly possessed themselves of Mr. Lloyd's plans and ideas for developing the site on which the Theatre Royal stands, and put them forward as their own. Among the gentlemen who took up the scheme was Mr. F. S. Bolton, who approached Mr. Charles on the matter. In 1900 Mr. Bolton's offer for the site was accepted, and he asked Mr. Charles to draw up more complete plans than he had then done. A plan was published in the "Birmingham Daily Mail," upon which defendant alleged that Mr. Charles, in the design which he had elaborated with Mr. Forbes, had stolen his (defendant's) ideas. The action was not brought to recover damages, but merely to clear the character of the plaintiffs from the aspersion that had been cast upon it. The first of the alleged libels appeared in a letter in which the defendant, writing to Mr. Bolton, stated: "You will have no difficulty in discovering that, no doubt unknown to you, your architect and builder have practically appropriated in its entirety my scheme." The second libel complained of appeared in a letter to an evening contemporary, in which the defendant asked that the line drawing of the plan prepared by him in July, 1899, and submitted to Mr. Bolton in July, 1900, might be published, the writer adding: "Upon comparing this with the plans published by Messrs. Charles & Forbes, a marvellous and striking resemblance in the arrangements will be discovered." Several prominent architects were called for the defendant to testify to the similarity of the plans in dispute. One gentleman said he had never seen two from different people that showed so great a similarity. Another described one plan as "practically a facsimile of the other." Mr. Justice Kennedy, in summing up, stated that the plaintiffs were suing practically for injury to themselves. They said that what had been written to Mr. Bolton and to the press was libellous and defamatory. What was the meaning of the letter written to Mr. Bolton before the defendant had made any enquiry of the plaintiffs? What would they think of any professional man who appropriated for his own advantage the brain-work of another? Was a statement suggesting that defamatory or not? If it was defamatory there was no justification. If the jury thought there was an imputation meaning that defendant accused plaintiffs of having appropriated that which was his, it was for them to say whether it ought not to be a matter for such reasonable —not vindictive—damages as would show that in their opinion it was a charge which ought never to have been made, and for which an apology ought to have been offered in the most open manner unless the writer was prepared to justify it.—The jury returned a verdict for the plaintiffs, awarding Mr. Charles £50 damages and Mr. Forbes £25.

Lowering a Road.—At the Birmingham Autumn Assizes last week a case was heard in which Mr. Jonathan Ellis, architect and surveyor, of Walsall, sought to obtain an injunction to restrain Mr. A. A. Buchanan and others, also of Walsall, from lowering, obstructing or otherwise interfering with the roads on the south side of the plaintiff's land so as to make access and egress to his house and grounds less commodious. It appeared that in 1884 the plaintiff rented a piece of land near Buchanan Road for a term of ninety-nine years, erected a house upon it and laid out gardens and carriage roads, and it was contended that the defendants in May last lowered the road adjoining the south side of the house to the extent of 3ft. By this action plaintiff alleged that the value of the house had depreciated, and the wall would require rebuilding, as it had been damaged by the excavations, while access to the house had been rendered more difficult. Defendants, on the other hand, contended that they had made the road according to the requirements of the local authority, by whom the plans were passed. They denied that they intended to interfere in any way with the plaintiff's property, and stated that while denying legal liability they had offered to make all necessary alterations to the plaintiff's drives and walks, and put in the necessary underpinning to the walls referred to. After a good deal of evidence had been given on both sides, Mr. Justice Bigham said the plaintiff should succeed in this action, as when he leased the land he did not contemplate the making of the new road, which would have the effect of pulling down the property which he had covenanted to build. The road was not required by the plaintiff, but was made by the defendants for their own advantage. He accordingly gave judgment for the plaintiff for £75, with £25 costs, and for the defendants on their counterclaim of £29 8s. for rent.

Temporary Structures in Westminster.—In the King's Bench Division of the High Court of Justice last week the case of the *Mayor, &c., of Westminster* v. *The London County Council* was heard. This came before the court upon a special case stated with a view of raising the question whether the County Council or the Corporation of Westminster was the proper authority to lay down conditions for (and to sanction) the construction of wooden structures erected for the accommodation of spectators at public functions taking place within the area of the city of Westminster. The Lord Chief Justice, in delivering judgment, said in his opinion the broad question should be decided in favour of the Corporation of the city of Westminster. The court did not propose to answer the third question as to the supervision of the district surveyor, as to do so would, they thought, lead to difficulties. They thought, however, the Corporation of Westminster was the authority which had the right to exercise the powers of section 84 of the London Building Act. The other judges concurred.

Welsbach Infringements.—In the King's Bench Division of the High Court of Justice last Thursday the case of *The Welsbach Incandescent Gas Light Co.* v. *Parkes* was heard. This was the first of thirty cases of this character. The plaintiff company asked for injunctions restraining the defendants from selling infringements of the plaintiffs' mantles, also for an enquiry before the Official Referee as to damages and costs. The court made the orders asked for in all the cases.

THE POLYTECHNIC CLASSES.

The prize distribution in connection with the above classes was the occasion of a crowded gathering at the large hall in Regent Street on Wednesday evening last. The chair was occupied by Mr. Thomas Blashill, F.R.I.B.A., and the presentations were made by Mr. Edmund Bulnois, M.P., Mayor of Marylebone.

The Polytechnic Director of Education, Mr. Robert Mitchell, in introducing the chairman, referred to the long list of successes of the "Poly" students. As an example of what was now being done, he mentioned that out of the seven silver medals just presented by the Royal Academy four had been gained by students at these classes. The chairman, in his introductory remarks, expressed the opinion that English engineers were quite competent to hold their own against those of other countries. To the students of architecture he would say that, although, as in most other professions, it was necessary to extend their study to embrace other arts bearing upon it, he would advise them to take up one particular branch and master that thoroughly. He advised them also to cultivate the faculty of observation, and to form an opinion upon every building they saw. Having distributed the prizes and certificates to over 200 students, Mr. Bulnois, M.P., said he could assure them that the Borough Council of Marylebone took a deep interest in the institution, and, like himself, were very pleased with the result of the examinations. Mr. C. Hawksley, president of the Institution of Civil Engineers, also gave a short address in which he said, as architects were considered to beautify the earth, engineers were believed to "uglify" it, but he hoped that by and bye the one would learn from the other, and everything would be in harmony. The prize distribution was followed by an entertainment.

BUILDING CONSTRUCTION.

(Continued from p. 319, No. 358.)

61. I asked my foreman mason, William Geraghty, to sketch for me a piece of *raked rubble* face. I give his sketch (Fig. 86). It shows very clearly what is meant, but it is not a *picture* of raked rubble; the joints are too clear and distinct; in the actual work the face would not be nearly so clean and tidy, because this particular masonry is to be left rough—surplus mortar being lightly raked off with the edge of the trowel, to give a good hold to the plaster and rough-cast. I find raked rubble quoted in "Smith's Builders' Prices and Memoranda," a small book, written by a practical man—a successful contractor—published in Belfast in 1863.

Owing to the variety of sizes of stones worked up, there is very little "waste" of the stone quarried. There need not be any through bonds; where the end of a three-quarter bond approaches the second face, it is made up with small stuff, which is better in this place than a "shiner" would be. The work is stronger than a wall built with close joints in one face and spauled work in the other face. It is bad work when it is built with bad mortar; it is the strongest kind of masonry when built with Portland-cement mortar of the proper kind great care being taken to have the stones clean on their surfaces, the best kind of clean surface being a fresh fracture.

If I appear to fail to take account of the chemical composition of mortar, stones, &c., methods of quarrying, &c., the student must not think that these matters are not present to my mind; they will be dealt with all in good time. My present business is with the work to a particular class of house as seen by a man of an observant habit, present at the work. The student will be more interested, by-and-by, to learn about the origin and composition of materials after he has made some way in the knowledge of their uses, and when they have become familiar objects to his mind, answering to their names.

Assuming that sand, lime and stones are delivered on the ground, there ought to be 3 labourers, to make mortar and "attend" with mortar and stones, to 2 skilled masons (in this proportion). The scaffolding for this work will be formed with casks and deals (12ft. by 9in. by 3in.). The number of casks (petroleum casks) and deals required will depend upon the number of men employed; for two masons, eight casks and fourteen deals will probably be enough; four additional deals will be required to make a small gangway (for a gangway the deals will be united in pairs by small bars 2in. by 1in., nailed across them about 20in. to 2ft. apart, giving foothold).

62. *To make mortar.*—(*a*) Take, say, fourteen loads of clean sharp sand (the mason will know whether the sand needs screening; in many cases no screening is required for this kind of masonry), at 18 bushels to the load (252 bushels, or, say, 307 cub. ft.); lay this down on clean ground, pavement, old macadamised carway, or if necessary a planking, not on soil which may become mixed up with the mortar; form it so that there will be a central floor with a fence-like border. Place on this floor 84 bushels of good suitable lime, and regulate the lime to have a level top. The lime is now slaked; pour the water upon it out of buckets. If the water is sprinkled over the lime the top layer may slake, producing flour and filling up the openings, so that the bottom layers are protected, and they will be imperfectly slaked. It is advisable to begin at the outer edge and to proceed spirally to the centre; each bucket of water is to be applied to the area for which it will suffice; and as the work of slaking is carried in towards the centre the slaked surface is covered with sand; finally the whole heap is covered with sand. The next day it may be tossed. "Tossing" is to shovel the heap two or three times to and fro so as to evenly mix the sand and lime. Some water should be added as may be necessary to, say, half-wet the mixture. It should be allowed to stand for two weeks as tossed, when it will be fit for tempering and to be carried to the masons. "Tempering" means working with a shovel (adding water if necessary) to the proper condition. As a rule, especially in contract work, we do not get the mortar quite so rich in lime as this; but a common specification is 1 of lime to 3 of sand. This quantity will build from 45 to 50 cub. yds. of masonry.

(*b*) Another way is to run the lime to putty. The sand is spread as already described, forming a floor with a fence-like margin: a wooden cistern about 4ft. by 3ft. by 18in., leaving a square hole cut in the middle of one end 6in. by 6in. close to the bottom, having two or three 1½in. iron bars across it to form a grating, and having a sliding shutter to close it on the inside. The top of this shutter should stand higher than the end of the cistern. The cistern is mounted on the sand rampart, so that the thin milk of lime will flow on to the floor when the shutter is raised. Water is filled into the cistern from time to time; the unslaked lime is thrown into the water, where it slakes with some commotion, giving off steam; the contents of the cistern are kept well stirred, and from time to time the sluice or shutter is raised to allow the milk-like fluid to run to the sand. Any unburnt pieces of limestone are retained in the cistern, to be cleared out from time to time. For small jobs it is quite a common plan to slake the lime in one or more casks, pouring the milk off from the top as it is formed. When the lime has been "run," and when the putty has become moderately firm, it is covered over with sand, and after a day or two it is tossed as already described, and allowed to stand for a fortnight to "sour." The lime may be slaked and the mortar souring before the full number of masons are on the job. While some of the labourers are carrying out the foreman's instructions in regard to this work, the first course of headers may be put into the foundation trenches, the stones brought from the quarry may be gone over, quoins picked out and rough dressed, &c.

63. *Cost of a Cubic Yard*:—

	s.	d.
1¾ bushels of lime - - - - -	1	6
5¼ „ „ sand - - - - -	0	8
1¾ tons of stones, at 3s. - - - -	5	3
Mason, ⅝ths of a day, at 6s. - - - -	3	9
Labourer, $\frac{15}{16}$ths of a day, at 2s. 6d., say -	2	6
	13	8

A rough-and-ready way of dealing with the openings in estimating is to measure them in for workmanship and deduct them for material. (It will be found necessary to use the punch in dressing the quoins.) I assume for the present that the window-sills, door-sills, and blocks and steps are bought ready-dressed, or these may be all made of Portland-cement concrete.

The stones brought from the quarry "stock" are laid down, and spread out as much as they conveniently can be, to facilitate picking out quoins and borders—special stones. Stones are carried to the work on handbarrows, and handbarrows cannot be moved up ladders when the work rises to a height which requires scaffolding The scaffold is reached from the ground by a gangway. Mortar may be carried in a *box* barrow. The old-fashioned hod is convenient for taking mortar or bricks up a ladder on a man's shoulder; but, except for very small jobs, it is found more convenient to rig up a pulley and haul up the materials with a rope. In circumstances where a gangway is not advisable a hod may be found convenient on a small scaffold where there is not room to work a *box* barrow. Cheap buckets of galvanized iron (zinced buckets) are found useful for distributing mortar; they have not a long life, being hammered against the mortar-board every time to shake out the mortar.

64. *Portland-cement concrete work.*—Thesand and other materials used with Portland cement should be free from any clayey particles, and their surfaces should be clean. It is usual to specify proportions as 1 of cement to 3, 4, 5 or 6 of other things. A question which deserves more consideration than it receives is that of the variation of sizes of fragments in the materials used. Suppose we take a quart measure full of No. 1 sportsman's shot and fill the interstices with water, measuring the quantity of water needed: again take the same quart measure filled with a smaller shot, say No. 8, and again fill up with water; it will be found that there is not much difference in the quantity of water in the two experiments. But if we intimately mix No. 1 with No. 8, we shall find that much less water will be required. Anyone can see that there is considerable economy in using "displacers" (large stones embedded in concrete); if we could graduate the sizes of the pieces from the smallest grain of sand up to the

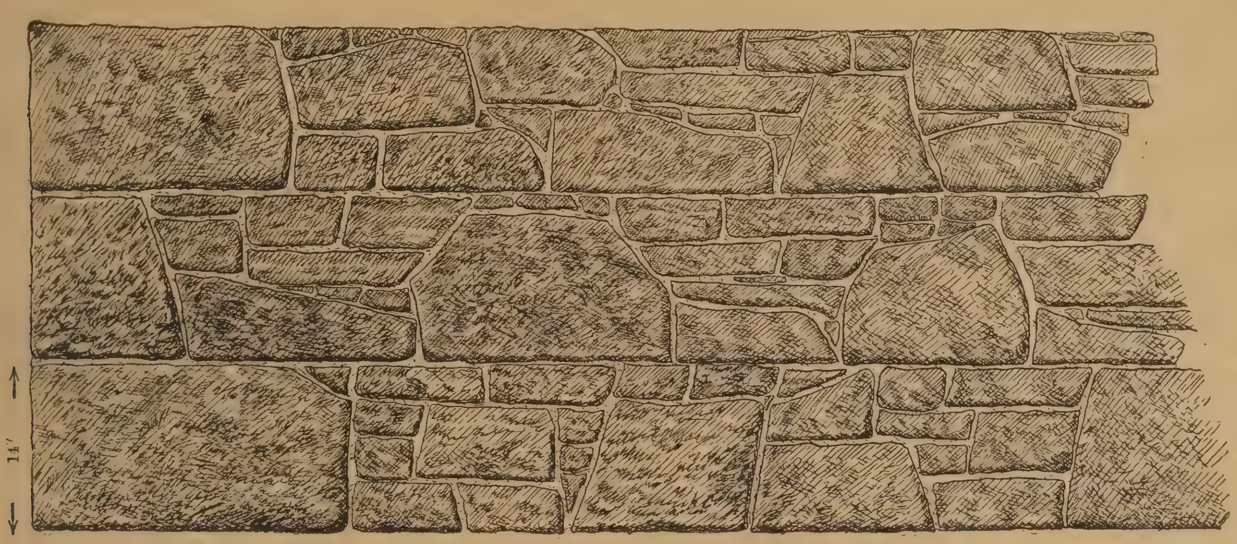

Fig. 86.

largest displacer, there would be considerable economy.

The combination of various-sized fragments, including the sand, is called the *aggregate*; the aggregate for the quantity to be wetted at a time is spread on a platform of planks or other clean floor, about 9in. thick; the *complement* of cement is spread on top, and the whole mass is tossed, say, by two men right and left, and then to the centre. This is repeated as often as may be necessary to incorporate evenly the whole of the ingredients. Water is now added, preferably through the rose of a watering can, but mostly without regard to this refinement; the important thing really is to keep the mixture moving while it is wet. The concrete must be just wet enough and not drowned.

65. *Chimney Flues and Stacks.*—If the lime of the district is fairly hydraulic, the flues may be built up round the drums (Fig. 84), keeping say, 1in. thick of mortar next the drum, giving the drum a slight twist by the handle from time to time, and lifting it up as the gable rises. It is, however, important that the flue shall be fairly close, so that soot will not spread from it through the wall, and in most cases it will be advisable to use either Portland-cement mortar or flue-linings (Fig. 85, previous article). The work may proceed, the flues being worked in the wall up to a little over the top of the collar-brace shown. At this level the stack may begin. The flues have been worked into line; they are 9in. in diameter, the thickness between is 4in. at thinnest. The box for the concrete mould will be 44in. long and 18in. wide, inside dimensions; it should be formed in four parts, each 9in. deep; they should be made to come apart at the corners, notched and pinned. Make them of 2in. stuff, planed smooth on the inside faces and jointed on the edges. Two portions of boxes can be made to serve, but the work will in that case have to be waited upon; with four portions the chimney may be completed in two days. Some of the lower parts will be removed and placed above (making an obvious provision for the projecting fillet). The flue drums (three of them) are kept moving up, and the parts of the box are only added as the work proceeds. Probably the best coating to be applied to the surface of the box, to prevent the concrete sticking to it, is a light coat of common lime whitewash: this does not interfere with the cement to prevent its floating well, as oil does. Some fine cement-mortar should be specially made to place next the timber. Three flue-linings should be placed at the top to serve for chimney-pots. If this has been carefully done, on the third day the whole of the boxing may be removed and the surface smoothed off, using a small wooden *float*, mending any small defects (and making up) with cement-mortar. This is a better plan than to work the concrete with a rough surface and afterwards to plaster the surface: it is much more economical. Care must be taken in working the chimney-stack to leave a raglet for cover flashing, as described later. The wall of the piggery yard has been built in cement-mortar. It will also be well to face the inside of the stye for, say, 3ft. with cement-mortar. The working of the half-round concrete-coping on the piggery yard-wall will be done with the assistance of three or four half discs set up on the wall and a straight edge; it should be floated off without any delay, because any second skimming will peel off and spoil the job. It should be a general rule to finish all concrete surfaces while the mass is still "green," so that the surface shall be part of the mass. We cannot afford the expense of tiles for floors, and, consequently, we shall have concrete floors in kitchen, shed, piggery (stye and yard) and privy; the privy pit shall also be formed in concrete. For dryness I advise that the surface under the wood floors of the bedrooms shall be concreted. I have already assumed that the door sills for outside doors are of dressed stone, and that they are set in the masonry at the proper level, which should only be done at the end of the masonry job. The greatest possible care must be taken to see that the ground on which we are about to place the concrete is properly consolidated. All filled parts must be well punned (or rammed) in layers. The surface should be covered with the chips and waste of the stones brought from the quarry, hand-packing the larger pieces, placing them with their largest face down and points up, filling in with smaller, so that there shall be a "bottomed" surface 3in. lower than the finished surface of the floors. In the bedrooms it shall be at a level 4¼in. lower to allow for the thickness of the wood floor. On this surface shall be placed the concrete. Straight pieces of timber, to serve the same purpose as plasterers' screeds, are bedded, so as to have their upper edge in the plane of the floor, and between these the concrete is worked to a level surface, using a straight edge. The surface is finished smooth with special fine stuff richer in cement than the general mass, but it should not be of the nature of a skimming; it should belong to the general body of the concrete. The floor of the shed should fall moderately to the paving. The piggery floor should fall to the doors with sufficient slope; this floor should be grooved on the surface to allow the moisture to drain underneath the straw and to give the pigs foothold. The privy pit shall be surfaced in the same way as the concrete floor. The hearths shall be of smooth cement-concrete. The concreting of the bedroom floors need not be finished so smooth as ordinary floor-concrete.

66. The plans (see previous article) show no drainage (or sewerage). It may be assumed that not far from the privy and piggery there is a receptacle—it may be a shallow pit in the ground—for manure, and that ashes and refuse will be carried to this place. The shed may be for the small supply of fuel for immediate needs, and it may be used for washing; it will be well to have a paved open channel from this paving to the refuse- or manure-pit. A Portunna labourer may have a small turf stack; a house for fuel is not within his reach. Better not enquire too narrowly how a man and his wife and a family of sons and daughters manage in two bedrooms. The arrangement is enormously in advance of the Connemara cabin. It will be advisable for the labourer to provide two or three petroleum casks. Place them on rough stands, shorten the down spoutings, and catch the rainwater from the roofs.

67. *Cost of Concrete.*—The cost of the mould for chimney-stack will be about 25s.; but this mould will answer for a large number of chimneys. The size of the stack is roughly 3·66ft. × 1·5ft. × 6ft. = 33 cub. ft. (including flues) = 1¼ cub. yds. A mason and labourer should put up this stack and finish it completely in two days' time.

	£	s.	d.
Say, 35 bushels aggregate, say, two tons at 3s. - - - - - - -	0	6	0
6 bushels of cement at 2s. 6d. - - -	0	15	0
Labour - - - - - - - -	0	17	0
Proportion for mould, say - - -	0	3	0
	£2	1	0

The bulk of concrete which given quantities of materials will make depends upon how they are measured; if broken stones, gravel and sand are measured separately, they measure very differently from what they will do after being mixed, because the smaller sizes fill up the interstices, as I have already explained. Above, they are supposed to be measured separately at the same price per ton. Let us suppose that the materials are such as that 12 bushels of broken stones, 8 bushels of gravel and 5 bushels of sand will, with 4 bushels of Portland cement, make 1 cub. yd. of concrete, taking 22⅛ bushels to a cubic yard; it will cost:—

	s.	d.
Broken stones - - - - - - - -	2	0
Gravel - - - - - - - - -	1	6
Sand - - - - - - - - -	0	10
Cement - - - - - - - -	10	0
	14	4

The sites for the floors being prepared, as I have described, with the highest points within 3in. of the floor level, the floors will take 4in. thick of concrete—that is, a cubic yard will cover 9 sq. yds., say 1s. 7d. a yard. A skilled tradesman and two labourers will finish 12yds. in a day at a cost of, say, 10s.: roughly, say, 2s. 5d. a yard for labour and materials (add to this the cost of bottoming). These are rough estimates, but they indicate the way in which accurate estimates may be arrived at. The materials available should be measured in the proportions supposed to be suitable, then mixed and re-measured; the cement should then be added, and the resulting wet concrete should be measured. In no department is there more looseness of specification than in this department of concrete, and in no department do contractors more frequently get the better of architects and engineers.

In these matters I am not above being checked and criticised; they are the things as to which practical men should compare experiences which must vary for different localities. But there are various kinds of critics. The kind of critic to whom I appeal is one in sympathy with myself, and not the man who is proud that he has found tripping this man who writes and professes to know everything. On the much discussed question, Theory against Practice, I have a word or two to say. The man who does his routine work unthinkingly may do work within narrow limits well, as the old kind of nail-maker or pin-maker did it; he is the extreme case of a practical man. Mr. Gladstone described a man who was so fastidious about his language—to have it in absolutely perfect form—that he reached a stage when he ceased to speak or write altogether; this is a still more extreme case of a theorist. In one important direction mere book-work fails. It does not give the proportions (of importance) of facts and operations to one another. In practice the importance of facts and operations is impressed by frequent recurrence of the operations and frequent penalties for ignorance.

(*To be continued.*)

HOW STONEHENGE WAS ERECTED.

AT a meeting of the Society of Antiquaries of London held on Thursday last, Mr. W. Gowland read a paper on "Excavations at Stonehenge." He assured them that the leaning-stone had been made safe, he believed for all time. The excavation was carried down to a depth of 8ft. 3in. below the datum line. With regard to the stone tools which had been discovered, he said it was evident that they were not used only for roughly breaking the rude blocks into regular forms, but also for working down their faces to a level or curved surface. They could, he thought, be legitimately assigned to the Neolithic age. The excavations had yielded sufficient to make clear generally the manner in which the operations of working and erecting the stones were carried out, but they threw little light on the transport of the blocks. For the solution of that problem they had to turn to the examples of similar work in countries such as Japan. He went on to describe the manner in which the blocks were set up and secured in their foundations. As to the most massive stones in the structure, the recumbent stone and the hitherto leaning-stone, which formed the piers of the central and the greatest of the trilithons, the excavations had afforded clear and conclusive evidence. The foundations were prepared by cutting away the chalk rock in such a manner as to form a hole between 8ft. and 10ft. deep, leaving an almost perpendicular face on the south-west side to form a buttress against which the back of the stone was to rest. From the bottom of the hole an inclined plane of rock sloping down from the interior of the enclosure was apparently cut. Both the rubble and chalk were also dug away for a considerable distance north-west, and to a depth of 4ft. on the south-west. The hole was then filled to a depth of 3ft. or 4ft., with white chalk rubble to form a layer in which to embed the pointed base of the stone and thus afford greater stability to it. The stone was then slid into the hole and gradually raised into a vertical position by means of levers and ropes. As the stone was being raised it was packed up with logs of timber and probably with blocks of stone placed beneath it. After its upper end had reached a certain elevation, ropes were attached to it, and it was then hauled into a vertical position so that its back rested against the face of the chalk. Two blocks of sarsen were afterwards placed under the oblique side of the base; the excavation was filled in with rubble. The purpose for which Stonehenge was erected was not a sepulchre but a place of sanctity, dedicated to the worship of the sun.

Maidstone was first lighted by Electricity last Thursday. The installation has been carried out by the Corporation at a cost of about £40,000,

SOCIETY OF ARCHITECTS.

HAMMERED IRONWORK.

By W. HÖFLER.

A MEETING of the Society of Architects was held on Thursday last at St. James's Hall, Piccadilly, the chair being occupied by Mr. Silvanus Trevail, J.P., who announced it his pleasant duty to present the Gold Medal of the Society to Mr. Walter Emden, L.C.C., for his services as president.

The following elections took place :—As Hon. Members : S. W. Kershaw, M.A., E. J. Naldrett, H. H. Richardson ; all of London. As Members : A. Laurence Cox (Folkestone), F. Victor Forrest (London, E.C.), R. Guy Kirkby (Sunderland); W. Harold Watson (Wakefield). As Students : Norman Harvey (Maidstone), Edwin Rothwell (Manchester).

Mr. W. Höfler then read a paper on "Hammered Ironwork" (with demonstrations by Mr. Ashford) as follows :—

FRITHWOOD HOUSE, NORTHWOOD. MERVYN E. MACARTNEY, ARCHITECT. (*See p.* 330.)

Whenever I watch an art-smith at work I am reminded of the old northern legend of

Wieland the Smith,

who was seized by King Envy and made to forge arms and armour by means of which the king might extend his realm ; and as the smith must work unfettered and yet not be able to escape, the tendons of his feet were cut, but the spirit of liberty was so strong within him that necessity taught him how to forge wings for himself, by which means he escaped and took vengeance on his captor.

It seems to me as if every art-smith had imbibed some of Wieland's feelings ; and the peculiar poetry in ironwork is no doubt arising from the fact that the worker must, so to say, fight against the stubborn resistance of the material which he has to get under control in order to accomplish his task. It is this supposition, this contrast which exists between the finished work and the violence of the strokes of the hammer, by means of which these graceful forms have been produced, which give the work its charm.

In the Olden Days.

The well-known truth that nothing really worth having is ever obtained without difficulties applies with special force to the smith's craft. The more difficult his work, the more the clever smith likes it, and the more of his individuality he puts into it. If the works of art in iron of the eleventh to the eighteenth centuries inspire us with so much admiration, it is partly on account of the strong individuality due to the difficulties originating from the very clumsiness and imperfection of the tools which the artists of that period had at their disposal. Just think that when the worker of these past ages wanted a nail he had to forge it himself, and that he had to take a rough bar of iron to produce not only his piece of art-metal work but often also the very tools with which to do the work.

How often have their patience and their passionate taste been sorely tried by all these material difficulties, which might have caused the less audacious to fail in their attempts ! All these drawbacks have disappeared in our days. The raw material undergoes tranformation which science pursues without interruption. Mechanical tools prepare or finish that which, as I just said, the worker of bygone days had to create himself. Bar iron, sheet iron, the various kinds of steel, nails, screws, &c.—all are manufactured with a view to the most economical application. I am, of course, far from condemning progress which brings us so many advantages and benefits ; but I cannot help saying, and I am sure I am neither too severe nor unjust in saying it, that it is decidedly detrimental to art-metal work in general. It has caused the number of real art-metal workers to diminish sensibly, and the art of the forge is seriously cultivated only by a few amongst them. For the art-smith's work is indeed a complex and difficult art. It requires of him who practises it a great knowledge of design and decoration, and a special experience which can only be gained in the course of many years. And the artist who has re-discovered the art of the ancients keeps it with jealous care.

A New Era.

However, a new era seems now to dawn. The architects in particular, and *all* men of taste who fully understand the artistic resources of the craft which occupies us, endeavour to allot an increasingly large place to ornamental ironwork in interior and exterior decoration.

I think there is a noble mission to fulfil. On the one hand, to strengthen and support the actual movement in favour of the employment of art-metal work by demonstrating its vast possibilities for rich ornamentation and its numerous applications ; on the other hand, to help its renovation and its extension by a short survey of the principal elements of knowledge which are necessary to a good art-smith.

As the native of a country (Austria) where there are so many useful State-aided institutions, I cannot help thinking that in England, too,- much good might be done by imitating the example, for instance, of Belgium, where the famous railings in the Place des Sablous, at Brussels, have been ordered by the State, the same being the case with the chancel rails in the Votive Church, Vienna.

It is certain that no smith can be called a good one unless he possesses that artistic intuition, that natural talent, with which every art-worker ought to be endowed. The boldness, the finish, and the beauty of his work are based to a great extent on that inborn skill, that natural cleverness, which experience alone, even combined with continuous practice, cannot give to those who do not possess it. As, however, many great men have held that genius is, after all, nothing else but the power of steady application to the one object which they had determined to master, much can be done by closely studying the various elements which combine to make up the science of art-metal work. They are : Designing, knowledge of material and tools, and practical skill in the various branches of the smith's work, which are forging, welding, embossing, mounting and finishing.

Design.

In speaking of design I do not intend to dwell on the subject of the history of art-metal work, as this would bring me to the almost inexhaustible subject of styles and periods, which has been treated by infinitely more competent speakers and writers than I am. I will only say that the main object in designing wrought-iron work is to obtain a pleasing original effect by means of graceful lines and curves, coupled with practical knowledge of construction which tends to produce an artistic object without superfluous expenditure. And you will, I hope, agree with me when I say that hardly any other material lends itself so well to absolute freedom of treatment in the interpretation of elegant and yet simple ideas. Even in England, which undoubtedly has taken the lead in sound ideas on artistic taste, the time is not very long past where such toy-things as imitation roses, spider webs, lizards, and many other naturalistic copies in iron, found great favour with the so-called "art-loving" public. The much-abused "art nouveau" (the "modern style") may have on its conscience a great deal that is unpalatable to the truly æsthetic, but surely it has the invaluable merit of having given the death-blow to all those weak and childish productions. The nineteenth century, with its astounding display of energy;

is surely none the less to be respected from an artistic point of view for having endeavoured to endow the future with an art which answers our reformed tastes and requirements, and the origin of this surprisingly sudden movement seems to be found in the complete transformation of the whole machinery of production.

The development of mechanical science during the past century has forced us to create certain objects the want of which had not made itself felt before. But just as in no previous centuries the transformation to entirely new art principles, even under the guiding influence of the greatest reformers, has been quite abrupt, so also now we find in the architecture of the most modern objects many lines which had already previously been employed, and which bear witness to the everlasting and real power of all that has been created by the great artists of old. We only wish to discard the pedantic attention to

Superfluous Ornamentation,

and seek beauty in rational application and treatment of the *material*. In my business experience I have noticed with much pleasure that of late years the demand for the so-called "armour-bright" ironwork has greatly increased, because this is the finish which, in the measure in which it leaves visible all the special features of the various processes of hammering, welding, embossing, and so forth, shows the natural beauties of the material—viz., iron—to the best advantage. Black iron stands next for artistic merit, but this black colour, which is obtained either through burning oil on to it or through painting it with "Dull Berlin Ivory Black," is really like painting iron with various colours or gilding, bronzing it, &c., a makeshift necessitated through the tendency of iron to rust when left unprotected. I have recently heard of a process whereby iron is said to be efficiently protected against rust by means of a metallic coating which in no way changes the natural grey colour of armour-bright iron; and it is sincerely to be hoped that this is not merely the delusion of a sanguine inventor's scheming brain.

As regards the architect's position in the matter of designs of art-metal work, I hope you will pardon my saying that I have not found these always quite practical. Junctions are frequently shown where it is impossible for a smith to weld, which induces pinning or riveting, neither of which are satisfactory to the conscientious smith. One of the great charms of mediæval ironwork is the utter absence of forced treatment, and it is this which raises the controversy as to who made the designs for these works, the architect or the smith. With all the varied duties and sometimes heavy anxieties which the architect has to bear, I should say that he will very often be glad to leave the task of carrying out the design of the art-metal work in the hands of the specialist.

Let us now proceed to the next section of our programme:

Knowledge of Material.

When you enter the smithy and you see the worker strike the piece of iron, you are put at once before the problem why the piece of iron yields which is to be worked, and not the hammer which deals the blow, nor the anvil which receives the blow, all of which appear to be—and, as I shall show you, actually are—made of the same material. You will say this is not correct; the one is iron and the latter two are steel. Nevertheless, both are composed of the same elements, and in both the proportion of these elements is almost identically the same. Steel is nothing but iron, only it contains a higher percentage of carbon. In the latter it is from about 0·05 to 0·6 per cent., in the former 0·6 to about 2·3 per cent. I call your attention to this figure 0·6, common to both because it shows at once how gradual the transition from one material to the other is. Which, then, are the important distinguishing features between the two? Iron, such as is alone suitable for our work, is soft. It can be hammered into all shapes, it can be flattened out, it can be swelled by the so-called process of "jumping," it can be bent at very sharp angles without breaking, and it assumes a pasty condition under the influence of great heat. This fact allows two separate pieces to unite in such a manner that they become practically one, and this process, which is so important for our work, is called welding. When heated, no matter to what degree, and suddenly cooled off in cold water, it does not changes its properties perceptibly.

Steel, on the other hand, is hard, breaks when bent at a sharp angle, becomes brittle when heated beyond a light-red colour, never assumes a pasty condition, and cannot therefore be welded. Its most remarkable property, however, shows itself when it is heated and then suddenly cooled off. In this case it becomes harder than glass, and just as brittle; when still more heated it loses all cohesion, so that small pieces detach under the slightest shock. As you can see, steel in this state would be quite useless for tools, but it can be treated in such a way as to preserve a sharp edge or point even when used with great force on material as hard as iron or ordinary steel. This treatment is called tempering, and it consists in heating the steel to a certain degree, which is judged by the colour it gradually assumes in the fire (from crimson to light red), and then suddenly cooling off in cold water. From this brittle condition it must be changed into a state of hardness or elasticity according to the different purposes it is to serve. This is done by slightly re-heating the material. It would be very difficult, if not impossible, to determine when the right degree of heating is reached if Nature had not provided a most wonderful phenomenon indicating this change. On a polished surface which has to be prepared for the purpose of more easily watching this phenomenon, during the process of re-heating appear in succession the following colours: Straw colour, dark yellow, light brown, dark brown, purple, dark blue, light blue, light grey. Straw-colour goes hand in hand with the hardness required for sharp tools which serve for working metal—for instance, punches, chisels, drills—this stage is still rather brittle; the brown colour accompanies the hardness sufficient for sharp wood-working tools or blunt tools destined for treating metal, such as the anvil and the hammer; blue comes into consideration only for articles which must be very pliable—all springs are tempered to that degree. The remaining two colours and the whole range of colours which during further heating fly over the surface in rapid succession are of little interest, as the material is approaching its original state.

Having spoken of the material of which the tools are made, I will not detain you with the detailed descriptions of those most used by the smith, but I will merely state that a conscientious smith will avoid as much as possible the aid of mechanical appliances, and confine himself to the use of the patriarchal anvil, hammer and tongs; the swage block, of which I have shown you a specimen, seems, however, to be a permissible addition to the smith's stock-in-trade.

I can now deal with the various operations to be performed by the smith. The first is

Forging.

It is best done when the material is heated to a light red. Smaller pieces are forged by one man; larger ones require one or more helpers, who then strike in rhythmic succession. Through knocking the piece against the anvil or through a few light strokes of the hammer, the glowing iron is freed from scale which otherwise would be hammered into the piece. If the latter is to become hard and elastic then the forging is to be continued until the piece becomes cold, or hammer and anvil are wetted, whereby a smooth surface is obtained. Pieces that have become too hard must be annealed—that is, heated to a dark red and gradually cooled down. The

Welding,

that is, joining of two separate pieces into one, is done when both are in a white heat. It is important that the smith should know exactly how to prepare his fire in order to heat his pieces, first in the right places and second to the right degree of heat, because the result depends on these two primary conditions; so that when the moment of welding has arrived he presents to the anvil two pieces of iron which are of the right heat and yet perfectly sound, which means not burnt. At first sight these conditions appear simple enough, and yet more than one smith whom one might ask whether he can guarantee his welding at the first attempt would at the critical moment where he introduced his pieces into the fire reply in the negative. The man is like seized with a fear of all the possible accidents; but this fear, instead of diminishing his faculties, gives him, on the contrary, an energy, a dexterity, a precision in the stroke of his hammer which he would certainly not have with *sang-froid*. For he knows that the welding can generally not be done twice over without seriously compromising the result, maybe, of days of difficult and always conscientious work. All these emotions through which he has to pass cause him to become passionate for his craft and to talk of it with pride. The points which the experienced worker will observe in order to prevent failure are the right size and intensity of the fire, which are best regulated by having a sufficient quantity of so-called "breeze" (breeze is coke from which less gas has been extracted than from ordinary coke, and it is washed three times in order to remove all dust and earthy substance which would cling to the iron and thus spoil the work) handy wherewith to replenish the fire, making it more intense than ordinary coal and allowing the iron to be evenly heated right through without burning it; then he will take care to prevent the blast or draught coming into direct contact with the pieces to be welded, as this would paralyse the action of the fire; he will turn round his iron often enough to protect it from being burnt, and each time he turns it he will sprinkle it with a little sand, which protects the outside of the piece from burning and helps the piece getting evenly heated.

The stretching is synonymous with the lengthening or widening of the piece of iron to be treated. The strokes with the thin end of the hammer are more efficient than those with the broad end.

The jumping is the opposite process, and produces a shortening and thickening of the piece. It is done by lifting and then heavily dropping the piece on to the anvil or to a special jumping block, or by striking one end of the piece with a hammer, whereby that portion of the iron which has been made red hot is swelled.

The adjusting gives to bent pieces or to those which have got out of their angle the right shape. It is done with the hammer on the anvil or on the "adjusting-plate," and can be done hot or cold.

The bending can also be done while the iron is hot or cold. If the piece has to be bent in an angle of 90 degs., it is hammered over the sharp-edged beak of the anvil; if it is to be round, the circular end of the beak is made use of.

The embossing or "repoussé" work gives to thin metal all sorts of plastic forms destined to enrich the heavier forged parts. It is done either hot or cold, the latter being preferable for the working of delicate details. Light hammers of a great variety of shapes, either with ball-shaped or edge-like, or flat faces, are employed for this work. Great experience is required to judge of the allowance to be made for reducing flat surfaces into curved and hollow shapes.

A Smith at Work.

Now we will imagine the smith setting to work, and we give him to make the piece which I put before you in the shape of this formidable-looking animal. Let the smith start by making the head. He will forge from a red-hot iron bar, say, 3in. wide by 4in. thick, by splitting it in front and opening it in the manner shown, whilst the neck is reduced in width and increased in thickness and rounded off so as to conform to the shape of the body. The mouth is further worked until the complete head has been formed. The lines are cut in with cold chisels of various shapes, round and straight. Then he will proceed to make the feet. He takes a bar of square iron, which he splits into four equal parts. These are spread out. An addition is then made in the form of a swelling above the claws, which are treated in a similar manner by welding a collar round each. The leg and the scroll are then made, and finally we have a ferocious animal completed.

In concluding his paper, Mr. Höfler described the making of an 8-light corona.

A Memorial Window has been placed in All Souls' Church, Harlesden, to the memory of Hubert E. Carlyon, vicar of the church, 1893–1900.

Masters and Men.

The Labour Market in November.—The Labour Department of the Board of Trade states that during November there has been some decline in the engineering and building trades. Employment in the building trades has continued to decline. The percentage of unemployed union members among carpenters and plumbers at the end of November was 3·5, compared with 3·1 per cent. in October and 3·3 per cent. in November of last year. In the furnishing trades employment has continued to fall off. The percentage of unemployed union members at the end of November was 4·2 compared with 3·6 per cent. in October. The percentage for November, 1900, was also 4·2. During the five weeks ended November 30th the number of dock and riverside labourers in London employed daily at all the docks and principal wharves averaged 15,909, as compared with 16,845 in the preceding four weeks, and 18,411 in the corresponding period a year ago. Twenty-five fresh disputes began in November 1901, involving 6,809 workpeople, of whom 4,924 were directly and 1,885 indirectly affected. The corresponding number of disputes in October was twenty-six, involving 10,501 workpeople; and in November 1900, forty-eight, involving 18,099 workpeople. Of the twenty-five disputes in November 1901, eight occurred in the mining and quarrying industries, nine in the metal, engineering and shipbuilding trades, three in the textile trades, and five in other industries. Of the twenty-five new and old disputes, involving 6,500 workpeople, of which the definite result is reported, seven, involving 1,556 persons, were decided in favour of the workpeople; eleven, involving 3,182 persons, in favour of the employers; and seven, involving 1,762 persons, were compromised. The changes in wages reported during November affected 257,961 workpeople, and the nett effect of all the changes was a decrease averaging 7¼d. weekly per head. Of the total number 10,500 received advances and 247,461 sustained decreases. The changes of the previous month affected 17,684 workpeople, the nett result being a slight rise, and during November 1900, the number affected was 148,774, and the net weekly result was an advance of 4½d. per head.

Builders' Notes.

Wolverhampton Town Hall is to undergo alterations and additions, and the tender of Messrs. H. Willcock & Co, of Wolverhampton, amounting to £14,550, has been accepted, and they have been asked to tender for the panelling of the council-chamber and the mayor's reception-room, and the erection of a gallery in the council-chamber.

Co-operative Building.—The December report of the Amalgamated Society of Carpenters and Joiners (which brings into prominence the fact that there is a general slump in the building trade) contains the noteworthy announcement that the great majority of the 68,000 members have voted in favour of the establishment of co-operative building and joinery works.

A Scaffold Accident.—Four men were on a scaffold engaged in work on the main entrance to the Cork Exhibition last Thursday, when the planks on which they stood gave way, and they were precipitated to the ground from a height of 30ft. One man was killed on the spot, and another sustained a fracture of the base of the skull, and is not expected to recover. Another of the men had his leg fractured, and the fourth received a bad shock.

Builders' Advertisements.—A writer in the daily press says: "It would appear that private-house leases commonly contain a minority clause directed against the carrying on of a business or exhibiting outside placards, &c. Nevertheless it is becoming the practice for builders, decorators, and others, during the period of their engagement to put up name boards and advertisements, chancing, I suppose, the legality of such being brought into question. When next time I am settling a bill for work done, in these circumstances I propose to deduct a handsome discount for any advertising space made use of."

Mr. Thomas Wilson, builder, aged sixty-seven years, who lived in Strathedene Road, Balne Lane, Wakefield, committed suicide recently. Deceased was a partner in the firm of Messrs. G. & T. Wilson, contractors.

Partnership Dissolved.—The partnership subsisting between Messrs. George Woollaston, of 22, Rockmead Road, South Hackney, and Robert Woollaston, of 22, Lacey Street, Bow (formerly carrying on business as builders, at 22, Lacey Street, Bow, E., under the style or firm of Woollaston Brothers), has been dissolved as from the 1st day of May, 1901.

Fire Prevention Tests.—The executive of the British Fire Prevention Committee have arranged to test next month a large timber floor by Millars Karri and Jarrah Wood Company, which is to show the fire-resistance of these Australian hardwoods compared with iron and concrete—a subject of the utmost interest to the great dock companies. The attendance of several distinguished foreign experts is anticipated. There will also be some door tests in karri and jarrah wood. We understand that among other tests to be expected early next year are tests by the Electric Timber Seasoning Company with treated wood; and by the British Uralite Company with fire-resisting slabs.

The Registered Plumbers in the District Council Area of Cardiff, South Wales and Monmouthshire, in connection with the Worshipful Company of Plumbers, London, held their annual dinner at Barry's Hotel, Cardiff, on December 14th, the president of the District Council, Mr. W. H. Dashwood Caple, architect, in the chair. Mr. E. W. M. Corbett, J.P., president of the Cardiff, South Wales and Monmouthshire Architects' Society, Alderman Ramsdale, J.P., Mr. Edwin Seward, F.R.I.B.A., Dr. Prichard, medical officer of health, Dr. P. J. O'Donnell, C.C., Dr. Alfred Rees, and Mr. E. W. Waite, hon. secretary, were present. In the course of the evening the president distributed certificates to four master and twenty-seven operative plumbers who had passed the qualifying examinations.

LONDON COUNTY COUNCIL.

At last week's meeting of the Council the Historic Records and Buildings Committee recommended that the many houses in London which had been associated with historical events or distinguished individuals should have some indication of such associations. The Society of Arts had been engaged in this work, but were not able to do so much as the Council could. Mr. Beachcroft moved an amendment referring the matter back for further consideration. He thought unless they had a committee of of taste it would be very difficult to carry out the Committee's proposal. It would be hard to say whether the author of "Cheer, boys, cheer" or the author of underground shallow tramways should be included in the list of distinguished persons. The amendment was defeated by 54 votes to 46, and the recommendation agreed to.—Replying to Mr. Beachcroft, Lord Welby stated that in connection with the strike at Horton Asylum, Epsom, a letter had been received from the council of the Operative Bricklayers' Society to the effect that the council, having considered the matter, had decided that if the County Council was prepared to open the work at once the workmen would resume. In answer the Committee had telegraphed that they would accept these conditions, and the strike was therefore at an end.—It was agreed to vote £1,330 to cover the cost of the interest on the purchase-money for the Marble Hill Estate. Lord Monkswell announced that as the Middlesex County Council seemed to object to clause 15 in the Council's General Powers Bill, relating to the provision of landing stages and boats at the estate, that clause would be dropped, at any rate for this year.—The adjourned report of the Housing Committee was presented, dealing with the Mill Lane scheme, Deptford. It is proposed to erect a Rowton House on the site to provide accommodation for 804 men. The cost of the building will be £49,287 15s., and it was recommended that the architect's estimate of this amount be referred to the manager of the Works Department to carry out the erection. After discussion this was agreed to.—The Works Committee presented a lengthy report relating to the status and duties of the several assistants in the engineers' and surveyors' departments, containing recommendations for increasing the salaries of several of the present assistants, and suggesting the following new appointments in the engineers' department: Assistant engineer (£250 per annum), third-class draughtsman (£75, rising by £5 to £100), and shorthand clerk and typist (£70, rising by £5 to £100). The recommendations were agreed to.—A statement was submitted by the Finance Committee showing the estimated and actual cost of works completed by the Works Department during the half-year ended September 30th last. The statement dealt with twenty-one works, the final estimate of which was £103,620 16s. 2d. The actual cost was £118,162 5s, showing a balance of £14,541 8s. 10d.

Keystones.

A New Free Library at Gorton has been opened.

A Spire on St. Philip and St. James's Church, Cheltenham, is proposed to be erected.

The Church of Manor Cunningham, Co. Donegal, is proposed to be restored at a cost of £1,000.

A Bust of Chaucer is being executed by Mr. Frampton for the Guildhall. It is to be carried out in marble and silvered bronze. Busts of Lady Granby and Mr. Alfred East, A.R.A., are also being executed by Mr. Frampton.

The Chancel of Aylesbury Parish Church Bucks, is to be panelled in oak, with pinnacled figures on the east wall, all round the sanctuary. This work, together with the provision of two brass candelabra, will costs upwards of £400.

New Works for Northwich.—Messrs. Gossage & Sons, soap manufacturers, of Widnes, together with a number of other influential manufacturers, have acquired a site of 141 acres at Rudheath, Northwich, and are about to erect a large works for the manufacture of chemicals and by-products.

The Private County Asylum at Thorpe is to be enlarged, at a cost of about £70,000., from plans by Mr. A. Wood, architect. It is proposed to enlarge the auxiliary building and connect it with a complete asylum for male patients, retaining the original building for females. The additions to the auxiliary building comprise new block for sick and infirm epileptics, and enlargement of the present eastern wing for acute cases. In addition to the wards it is proposed to erect new workshops, mess and recreation rooms for attendants, a new bakery, a photographic studio, and to make sundry alterations in the administrative offices. The suggested alterations at the main building comprise the re-arrangement of the stables, workshops, and boiler-house.

At Wendron Church, near Holston, carved chancel fittings, in West-country grown oak, have been recently presented as a memorial to the late Rev. William Lethbridge. These additions consist of stalls, affording accommodation for twelve choirmen and fourteen singing boys, with detached desks and seats for two officiating priests; a lectern, as well as altar rails. These latter are entirely made of carved oak. The stalls, like all the rest of the new work, are in the fifteenth-century, or Perpendicular, style of Gothic, and are of massive construction; the fronts being pierced by tracery and enriched by carving. The work was executed by Messrs. Harry Hems & Sons, of Exeter.

Croyland Abbey.—Funds are appealed for to enable the repairs necessary to secure the preservation of what remains of the grand old Abbey of Croyland or Crowland to be completed. The work has been going on since 1887, and nine out of the ten sections into which it was originally divided have been accomplished. The object all through has been preservation, not what is commonly known as restoration: to make safe and secure the Abbey fabric, and to protect the ruined parts from further ruin and decay. The north aisle is used as the parish church, and its roof has for a long time been in a bad state. The late Mr. J. L. Pearson, R.A, said it ought to be entirely taken off and renewed and the lead covering recast and relaid. In its present condition it presses against the outer walls, and so has developed cracks in the groining below, besides doing other mischief. To put this right would cost nearly £600.

Alston Town Hall has been opened after extensive renovation of the interior.

The Renaissance Saloon at the Café Monico has been redecorated by Messrs. V. & G. Jetley, of 8, North Audley Street, Grosvenor Square.

Colchester New Town Hall was opened last Monday. The building has been designed by Mr. John Belcher, A.R.A., of 20, Hanover Square, W., and erected by Messrs. Kerridge & Shaw, builders, of Cambridge.

Builders' Journals Wanted.—The publisher will be glad to send a copy of the current number of "The Architectural Review" in exchange for a copy of "The Builders' Journal" for December 27th, 1899.

A New Public Museum at Sheffield has been opened at High Hazels Park, Darnall, one of the suburbs of the city. The park has belonged to the Corporation for a number of years, but it is only of late that the Council resolved to transform the house into a museum. This has been effected at a comparatively little cost, as no structural alterations were involved.

Camberwell Public Baths Competition.—The first premium has been gained by No. 18, Mr. E. Harding Payne, the second premium by No. 7, Messrs. S. B. Russell and C. E. Mallows, and the third premium by No. 32, Mr. H. Dighton Pearson. Mr. E. Harding Payne has been appointed architect, and the building is estimated to cost £50,000. Mr. A. Saxon Snell, the assessor, also highly commended five others, to each of whom the committee recommended £10 should be given, but this was not approved; out of these five the design No. 35 by Mr. Arthur R. Groome, A.R.I.B.A., of St. Peter's Square, Manchester, was especially noticeable.

A New Coastguard Station at Bexhill is being erected for the Admiralty. The scheme provides for two rows of houses, running north and south. One block will contain five houses and the other seven houses, all being two-storey buildings, with the exception of the chief officer's residence, which will have an additional attic-floor, and to this dwelling the watch-room will be attached. The houses in both rows will each contain five or six rooms, the chief officer's residence having two additional rooms. There is to be a boat-house built in connection with the scheme to provide accommodation for two boats, with dimensions of 32ft. by 18ft. Messrs. Nash & Nash, of Thornton Heath, are the contractors.

New Cathedral in Uganda.—Mr. Borup, of the Church Missionary Society, has sent home some interesting details of a church of brick which is being built under his direction by the Baganda. Fifty-six bricklayers are employed, most of whom have been trained since last year. They are, Mr. Borup reports, working willingly, and he does not think there will again be any difficulty in getting briaklayers in the country. The length of the church is 206ft., the width is 50ft. The roof will be thatched with grass. In addition to the bricklayers several hundred other workmen are engaged, and are receiving weekly wages.

New Public Offices at St. Annes have been erected on South Drive from designs by Mr. Muirhead, of St. Annes and Manchester, and will have cost about £4,000. The building stands within about half an acre of ground. The building is entered through a Norman arch, leading into a commodious vestibule, sliding doors leading into a spacious hall, which has a noticeable mosaic floor, the work of Messrs. Turner, Heason & Mitchell. The council-chamber is a large room 28ft. by 22ft. Adjoining are the offices of the clerk and sub-clerk; here is a chairman's room and a committee-room. On the ground-floor are the surveyor's private and public offices: the rate collectors, overseers', and medical officer's offices, and electrical engineer's offices. The building is heated throughout on the latest hot-water pipe system by Mr. W. Bailey, of Manchester. The general contractor was Mr. W. Woodcock, of St. Annes, and the sub-contractors were Mr. J. S. Comfort, brickwork; Mr. J. C. Rushfirth, stonework; Mr. W. Read, plumbing; Mr. W. Woodcock, plastering; Messrs. Matthews & Radcliffe, painting and decorating; Mr. T. Pearson, slating; and Mr. W. Woodcock, joinering, the latter has supplied all the fixtures; Messrs. Garnett & Co., furnishing; Messrs. Gill & Read, fire ranges; Mrs. C. W. Slee, fire-irons, &c.

Two Painted Glass Windows have been erected in the south wall of the royal pew at Whippingham Church, Isle of Wight, in memory of the late Duke of Saxe-Coburg and Gotha.

Berlin's Avenue of Victory.—The last figure in the row of statuary in the Sieges Allee, Berlin, was unveiled last week by the German Empress. The statue represents the Kurfürst Johann Georg.

New School Buildings at Keswick have been opened. They consist of a gymnasium, science laboratory, cookery school, and carpenter's shop. The block is situated a few yards from those opened in 1898. The architects are Messrs. Austin & Paley.

Mr. Sargent, R.A., has been created a corresponding member of the French Academy of Fine Arts. In Paris he had his chief training, in the studio of M. Carolus Duran. Beginning young, Mr. Sargent exhibited his first work in the Salon of 1879.

A School Competition.—We have before us the particulars of the proposed additions to the High School buildings at Kirkcaldy. A block plan is required showing drainage, but no plan of the site is given! And the Board will pay a fee of 4 per cent. to the successful architect! This is what brings competitions into disrepute.

A New Baptist Church at Cambridge is to be erected in St. Andrew's Street, the design of Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines having been accepted. The building is to be faced with whole white flints; the dressings, tracery, &c., being of red Mansfield stone. A bold square tower forms a prominent feature of the design. The joinery is to be of oak. The seating accommodation will be for about 950 persons. The estimated cost is £6,200.

A New Market at Bury has been erected by the Corporation, at a cost of £14,500, at the junction of Market Street and Moss Lane. The new market covers a superficial area of about 30,000ft., and is so planned as to be capable of easy extension by the addition of bays to the south. There are provided one hundred stalls, nineteen shops and five fish shops. The shops are placed round three sides of the building. The central hall extends across the angle formed by the junction of Market Street and Moss Lane, and is approached by a wide central entrance and by two side entrances.

A Discovery at Falkirk has been made of interesting relics of the Roman occupation of the Stirling district, in the shape of a large stone, about 19in. broad, 10in. thick, over 4ft. high, and weighing probably half a ton, beautifully sculptured in high relief; the ornamentation divided into two panels, the larger one being at the top. These panels are separated by a band about 1½in. broad, which also is carried round both panels, meeting in an angle at the top of the stone. Under the angle is a shell-like device, delicately executed. The upper panel is completely filled by a horse and rider, the latter carrying a sword triumphantly aloft. He is arrayed in full armour, and bears a shield. The lower panel represents a naked man, a wild Celt presumably, in a fallen condition, his shield and weapon lying beside him. The profile is perfect, and the stone is in a complete state of preservation.

Architect to the Birmingham School Board.—At the forthcoming meeting of the Birmingham School Board the Sites and Buildings Committee will recommend that three months' notice be given to Messrs. Martin & Martin, architects and surveyors, to terminate their engagement, all work which they have now in hand for the Board to be completed by them on the existing terms; that the Board advertise for an architect to be the architect to the Board for new works at a rate of remuneration of 7s. 6d. per scholar of accommodation, plus 1½ per cent. for taking out and furnishing quantities the engagement to be for three years, with a clause for determining the same at three months' notice on either side at any time; that the Board advertise for a land surveyor at a commission of ¾ per cent. on the purchase money; and that the Board advertise for a superintendent of buildings for alterations and repairs, at a salary of £250 per annum, to devote all his time to the duties and to work in the Board's offices, all necessary office furniture, stationery, &c., being provided by the Board.

COMING EVENTS.

Saturday, December 28.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—I. 3 p.m.

Tuesday, December 31.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—II. 3 p.m.

Wednesday, January 1.

SOCIETY OF ARTS.—Sir Henry Trueman Wood on "Photography and its Applications"—I., 5 p.m.

Thursday, January 2.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. A. S. E. Ackermann, A.M.I.C.E., on "Engineering Observations in 1901 in the United States of America," 8 p.m.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—III., 3 p.m.

Friday, January 3.

ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century." 7.30 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. John Buley on "The Uses of Exhaust Steam," 8 p.m.

CURRENT MARKET PRICES.

		£	s.	d.	£	s.	d.
FORAGE.							
Beans	per qr.	1	10	0		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	12	6
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	2	0	0
OILS AND PAINTS.							
Castor Oil, French	per cwt.	1	7	0	1	8	7
Colza Oil, English	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels	do	1	10	3		—	
Petroleum, American	per gal.	0	0	6⅞	0	0	7¼
Bo. Russian	do.	0	0	6¼	0	0	6⅜
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	6	4	0	6	5	4
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	11	0		—	
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	7	3	1	7	6
METALS.							
Copper, sheet, strong	per ton	75	0	0		—	
Iron, Staffs., bar	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0		—	
Lead, pig, Soft Foreign	do.	10	7	6		—	
Do. do. English common brands	do.	10	15	0	10	17	6
Do. sheet, English 3lb per sq. ft. and upwards	do.	11	17	6		—	
Do. pipe	do.	12	5	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	0	0		—	
Do. floor brads	do.	8	15	0		—	
Steel, Staffs., Girders and Angles	per ton	6	0	0	6	5	0
Do. Do. Mild bars	do.	6	15	0	7	5	0
Tin, Foreign	do.	103	5	0	106	15	0
Do. English ingots	do.	112	10	0		—	
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	2	6	17	10	0
TIMBER.							
SOFT WOODS.							
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec, Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	10
Do. Petersburg	per bundle	0	0	9	0	0	0½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	0	0		—	
Do. do. 2nd "	do.	12	10	0		—	
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st	do.	27	5	0		—	
Do. do. 2nd	do.	12	15	10	13	0	0
Do. do. 3rd &c.	do.	9	10	0		—	
Do. Canadian Spruce, 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	7	15	0	9	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	5	10	6	11	5	0
Flooring Boards 1in. prepared, 1st	per square	0	11	3		—	
Do. 2nd	do.	0	10			—	
Do. 3rd &c.	do.	0	9	3		—	
HARD WOODS.							
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	$4\frac{5}{32}$		—	
Do. Honduras	do.	0	0	1¾		—	
Do. Tobasco	do.	0	0	3¾		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	$4\frac{11}{32}$		—	
Do. African	do.	0	0	3⅛		—	
Do. St. Domingo	do.	0	0	6¾		—	
Do. Tobasco	do.	0	0	$3\frac{29}{32}$		—	
Do. Cuba	do.	0	0	$4\frac{7}{16}$		—	
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Dec. 26	Keighley—Cement, &c.	Corporation	W. H. Hopkinson, Borough Engineer, Keighley.
„ 27	Coedpoeth, Wales—Wesleyan Minister's House	—	W. Ll. Jones, Architect, Bangor.
„ 27	Dulverton, Somerset—Court House and Police Station	County Council	W. J. Willcox, 1 Belmont, Bath.
„ 27	Glasgow—Plaster, Tile, Glazier Works for Hospital	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
„ 27	Darlington—Branch Stores	Co-operative Society	Clark & Moscrop, Architects, Feethams Darlington.
„ 27	Morley—Stables, Cart Shed, &c.	Corporation	W. E. Putman, Borough Engineer, Town Hall, Morley.
„ 27	Penzance—Blue Lias Lime, &c.	—	F. Latham, Borough Surveyor, Public Buildings, Penzance.
„ 28	Horton, Epsom—Nine Padded Rooms at Asylum	London County Council	R. W. Partridge, Clerk to Asylums Committee, 6 Waterloo Pl., S.W.
„ 28	Lancaster—Mason and Bricksetter's Work to Car Shed	Tramways Committee	Borough Surveyor, Town Hall, Lancaster.
„ 28	Oban, Scotland—Entrance Lodge	—	K. Macrae, 5 Argyll Street, Oban.
„ 30	Rudry—School Buildings	School Board	B. Lawrence & Son, Architects, Newport, Mon.
„ 30	Erdington, Birmingham—Pavilions, Boiler House, &c.	Aston Union Guardians	J. North, Clerk, Union Offices, Vauxhall Road, Birmingham.
„ 30	London, S.E.—Sorting Office	Commissioners of H.M. Works	J. Wager, H.M. Office of Works, Storey's Gate, Westminster.
„ 30	St. Budeaux, Cornwall—School and Boundary Walls	School Board	T. R. Kitsel, 1 George Street, Plymouth.
„ 30	Queenstown, Iceland—Portland Cement	Urban District Council	J. H. Campbell, Clerk, Town Hall, Queenstown.
„ 30	Southampton—Alterations to Schools	School Board	G. C Gandy, Clerk, Woolston, Southampton.
„ 30	Newbiggin-by-Sea—Sixteen Cottages	Co-operative Society	T. Welsh, Secretary, Co-operative Soc., Newbiggin-by-Sea.
„ 31	Hanley, Staffs—Home	—	R. Scrivener & Sons, Architects, Hanley, Staffs.
„ 31	Kinoble, Bucks—Bungalow House	F. H. Parrott	G. H. Manning, 6 Walton Street, Aylesbury.
„ 31	Burnham-on-Crouch—Additions to Stone House	—	F. J. King, King's Arms Inn, Burnham-on-Crouch.
„ 31	Dewsbury—Covered Market	Corporation	H. Dearden, Borough Engineer, Town Hall, Dewsbury.
„ 31	Preston—Underground Convenience	Corporation	Borough Surveyor, Town Hall, Preston.
1902.			
Jan. 1	Portmadoc—Alterations, &c., to Market Hall	Ynyscynhaiarn Urban District Council	M. Thomas, Surveyor, 20 Bank Place, Portmadoc.
„ 2	Kinsale—Labourers' Cottages, Outoffices, Piers & Gates	Rural District Council	Engineer to Council, Workhouse, Kinsale.
„ 3	Branksome, Dorset—Railway Wall and Gates	Urban District Council	W. H. Curtis, Clerk, Council Offices, Branksome.
„ 4	Leeds—Hospital Extension	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 4	Cardiff—Masonry Abutments, Retaining Walls, &c., of Bridges.	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 4	Kirkcaldy—Electric Generating Station	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 4	Athlone—Doctor's Residence, Stables and Dispensary	Union Guardians	P. J. Prendergast, Engineer, Athlone.
„ 6	Gwennap—Enlargement of Schools	School Board	S. Hill, Architect, Redruth.
„ 6	Rotherham—Fireclay, Retort, Bricks, &c.	Gas Committee	F. A. Winstanley, Engineer, Rotherham.
„ 6	Edinburgh—County Council Buildings	Midlothian County Council	A. G. G. Asher, 29 St. Andrew Square, Edinburgh.
„ 6	Wolverhampton—Insulation of Cold Stores	Markets Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„ 7	Ashington, Morpeth—Isolation Hospital	Urban District Council	A. Wood, Surveyor, Market Place, Ashington.
„ 7	Holyhead—Infant School	School Board	R. E. Pritchard, Clerk, Bradford House, Holyhead.
„ 9	Cardiff—Car Depôt	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 15	Plymouth—Enlargement of Head Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
„ 15	Alltwen, Wales—School	Cilybebill School Board	W. W. Williams, 63 Wind Street, Swansea.
„ 20	Bury—Central Tramway Depôt	Tramways Committee	A. W. Bradley, Borough Engineer, Bury.
„ 13	Cwmcelyn, near Blaina, Mon—Infants' School (200 Children).	Aberystruth School Board	R. L. Roberts, Architect, Abercarn.
	ENGINEERING:		
Dec. 27	Glasgow—Smith Work and Electric Lighting at Hospital.	Parish Council	J. Baxter, 243, St. Vincent Street, Glasgow.
„ 27	Stafford—Shop Superstructure at Electrical Engineering Works.	Siemens Bros. & Co. Ltd.	Siemens Bros. & Co., Ltd, Woolwich.
„ 28	Reading—Electrical Plant	Corporation	Borough Engineer, Town Hall, Reading.
„ 28	Woodford, Northants—Steel Tower, Windmill Pump, &c.	Parish Council	Mr. Lloyd, Council's Engineer, Thrapston.
„ 30	Granton, Edinburgh—Steel Latticed Girder Footbridge	Gas Commissioners	W. R. Herring, Chief Engineer, New Street Works, Edinburgh.
„ 31	Littleton, Middlesex—Bridge across River Ash	County Council	H. T. Wakelam, County Engineer The Guildhall, Westminster.
„ 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
1902.			
Jan. 1	Lower Egypt—Lock Gates for Ziftah Barrage Works	Inspector-General of Irrigation	Inspector-General of Irrigation, Lower Egypt.
„ 1	Kingston-on-Thames—Two Filter Beds	Corporation	Borough Surveyor, Clattern House, Kingston-upon-Thames.
„ 1	Farnham—Washing Machine	Guardians	Mr. Ireland, Master, Workhouse, Farnham.
„ 2	Nantwich—Waterworks	Rural District Council	J. A. Davenport, 152 Hospital Street, Nantwich.
„ 3	Bakewell—Water Scheme	Rural District Council	Sterling & Swann, Engineers, Town Hall, Chapel-en-le-Frith.
„ 4	Cardiff—Widening and Reconstructing Bridges	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
„ 6	Nantwich, Cheshire—Electric Plant	Urban District Council	Under-Secretary for Public Works, Sydney.
„ 6	Rochford, Essex—Pumping Machinery	Rural District Council	J. Mansergh, 5 Victoria Street, Westminster.
„ 6	Bournemouth—Electric Cables, &c.	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
„ 6	Bratton Fleming, Devon—Tunnel	Ilfracombe Urban District Council	Surveyor, Town Hall, Ilfracombe.
„ 7	Tynemouth—Gravitation Main	Corporation	J. Mansergh, 5 Victoria Street, Westminster.
„ 7	Manchester—Laying Waterpipes from Thirlmere to Manchester.	Corporation	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
„ 8	Christiania—120 Ammunition Wagons	Norwegian Government	Artilleriets Vœrksteder, Fœstninger, Christiania.
„ 8	Bromsgrove, Worcs—Sinking for Water Supply	Asylum Committee of Visitors	R. O. Seacome, Clerk to the Committee, Shire Hall, Worcester.
„ 8	Ponteland, near Newcastle—Railway	North Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-upon-Tyne.
„ 8	Shepton Mallet, Somerset—Waterworks	Rural District Council	W. Phelps, Engineer, Council Offices, Market Pl., Shepton Mallet.
„ 8	Kirkcaldy—Steam Pipes, Pumps, &c.	Corporation	Kennedy & Jenkin, 17 Victoria Street, Westminster, S.W.
„ 8	Bromsgrove, Worcs.—Sinking for Water Supply	Asylum Committee of Visitors	R. O. Seacombe, Clerk, Shire Hall, Worcester.
„ 8	Ashton-in-Makerfield—Steam Road Roller, Scarifier and Sludge Remover.	Urban District Council	J. W. Liversedge, Surveyor, Council Offices, Ashton-in-Makerfield.
„ 10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	G. H. Hill & Sons, 3 Victoria Street, Westminster.
„ 15	London, N.—Electrical Plant	Hornsey Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 14	West Ham—Condensing Plant and Crane	Town Council	Borough Electrical Engineer, Abbey Mills, West Ham, E.
„ 16	Painstaple—Electrical Plant	Town Council	W. H. Trentham, 39, Victoria Street, Westminster, S.W.
„ 17	West Bromwich—Electric Tramways	Town Council	A. D. Greatorex, Borough Engineer, Town Hall, West Bromwich.
„ 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
„ 21	Manchester—Electric Switchboards	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
„ 27	Madrid—Electric Tramway Concession	Spanish Ministry of Public Works	Commercial Department, Foreign Office, S.W.
„ 31	Johannesburg—Carburetted Water and Gas Plant	—	Crown Agents for the Colonies, Downing Street, London.
Feb. 5	Calcutta—Waste-water Meters	Corporation	F. Gainsford, Secretary to Corporation, Calcutta.
„ 17	London, E.C.—Widening London Bridge	Corporation	City Surveyor, Guildhall, E.C.
„ 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
Mar. 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
	FURNITURE:		
Dec. 31	Weston-super-Mare—Furniture and Fittings	Urban District Council	H. Nettleton, Surveyor, Town Hall, Weston-super Mare.
	IRON AND STEEL:		
Dec. 26	Keighley—Ironmongery Iron Castings, &c.	Corporation	W. H. Hopkinson, Borough Engineer, Keighley.
„ 27	Penzance—Cast- and Wrought-iron Work, &c.	—	F. Latham, Borough Engineer, Public Buildings, Penzance.
„ 27	Christiania—281 dozen Files	Intendent of the Norwegian Railway	Commercial Department, Foreign Office, S.W.
„ 27	Dublin—Castings, &c.	Gas Company	F. T. Cotton, Secretary, D'Olier Street, Dublin.
„ 30	King's Lynn—Ironmongery Castings, &c.	Corporation	H. J. Weaver, Borough Engineer, King's Lynn
„ 30	Waterford—Hydrants, Sluice Valves, Stop Cocks, &c.	Corporation	J. Fleming, Borough Surveyor, Mall, Waterford.
„ 30	Ilford—1,000 6in. Pipes	Gas Company	J. H. Brown, Engineer, Gas Works, Ilford.
„ 30	Inverness—Cast-iron Pipes	Gas Commissioners	K. Macdonald, Town Clerk, Inverness.
1902.			
Jan. 3	Branksome, Dorset—Wrought-iron Railing and Gates	Urban District Council	W. H. Curtis, Clerk, Council Offices, Branksome.
„ 4	Leeds—Smith and Ironfounder Work at Hospital	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 4	Halifax—Castings, Ironmongery, &c.	Waterworks Committee	J. A. Paskin, 22 George Street, Halifax.
„ 6	Edinburgh—Iron and Steel Work to Buildings	Midlothian County Council	A. G. G. Asher, 29 St. Andrew Square, Edinburgh.
„ 7	Sheffield—Ironmongery, Castings, &c.	Tramways Committee	A. L. C. Fell, General Manager, Tramways Department, Town Hall, Sheffield.
„ 8	Christiania—Railway Points	Norwegian State Railways	Commercial Department, Foreign Office, S.W.
„ 30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	PAINTING AND PLUMBING:		
Dec. 27	Glasgow—Plumber Work at Hospital	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
„ 30	Waterford—Lead, Lead Pipes, &c.	Corporation	M. J. Fleming, Borough Surveyor, Mall, Waterford.
„ 31	Brighton—Painting and Renovating at Workhouse	Guardians	H. S. Reed, Surveyor, Parochial Offices, Prince's Street, Brighton.
1902. Jan. 4	Leeds—Plumber and Painter Work at Hospital	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 4	Halifax—Oils and Paints, Leads, &c.	Waterworks Committee	J. A. Paskin, 22 George St., Halifax.
„ 6	Edinburgh—Plumbers' Works at County Council Blgs	Midlothian County Council	A. G. G. Asher, 29 St. Andrew's Square, Edinburgh.
„ 7	Sheffield—Oil, Paints, Brushes, &c.	Tramways Committee	A. L. C. Fell, Tramways Department, Town Hall, Sheffield.
„ 10	Halifax—Painting, Colouring, &c., at Town Hall	Finance Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
No date.	Great Yarmouth—Internal Painting	Norfolk Cold Storage and Ice Manufacturing Co.	G. F. Geoghegan, 32 Prince of Wales Road, Norwich.
	ROADS AND CARTAGE:		
Dec. 26	Dumbarton—Whinstone Metal for Roads	——	Burgh Surveyor, 16 Quay Street, Dumbarton.
„ 26	Keighley—Broken Limestone and Granite, Flags, &c.	Corporation	W. H. Hopkinson, Borough Engineer, Keighley.
„ 26	Middlesbrough—Street Works	Streets Committee	Borough Engineer, Municipal Buildings, Middlesbrough.
„ 27	Elgin—Road Metal	——	A. Hogg, 24 Academy Street, Elgin.
„ 27	Penzance—Granite, &c.	——	F. Latham, Borough Surveyor, Public Buildings, Penzance.
„ 27	Glasgow—Cement Paving	Parish Council	J. Baxter, 243 St. Vincent Street, Glasgow.
„ 31	Bristol—Brushes, Brooms, &c.	Baths Committee	J. Kane, Chief Superintendent, Jacob's Wells Baths, Bristol.
„ 31	Newmarket—Broken Granite Metalling and Flag	Urban District Council	S. J. Ennion, Clerk, Deva Chambers, Newmarket.
„ 31	Wealdstone, Middlesex—Granite Chippings	Urban District Council	F. H. Parr, Council's Surveyor, Wealdstone.
„ 31	Middleton, Lancs—Paving, Flagging, Sewering, &c.	Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton.
„ 31	Merthyr Tydfil—Laying-out Recreation Ground	Urban District Council	Surveyor to Council, Town Hall, Merthyr Tydfil.
1902. Jan. 4	Horsham, Sussex—Materials	West Sussex Roads & Bridges Committee	W. B. Purser, 4 Worthing Road, Horsham.
„ 4	Wolverhampton—Street Works	Streets Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„ 4	Carrickfergus—Granolithic Footpath	Urban District Council	J. Boyd, Town Clerk, Town Hall, Carrickfergus.
„ 4	Whitley, Northumberland—Street Works	Urban District Council	J. P. Spencer, 30 Howard Street, North Shields.
„ 6	London, N.—Tar Paving	Edmonton Urban District Council	G. E. Eachus, Town Hall, Lower Edmonton.
„ 7	North Shields—Rubble Foundation and Paving	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, North Shields.
„ 9	Castleford, Yorks—Improvement Works	Urban District Council	W. Green, Surveyor, Castleford, Yorks.
„ 14	London, N.—Street Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
	SANITARY;		
Dec. 26	Keighley—Earthenware Pipes, &c.	Corporation	W. H. Hopkinson, Borough Engineer, Keighley.
„ 30	Tendring, Essex—Removal of Refuse	Rural District Council	A. J. H. Ward, 42 Church Street, Harwich.
„ 30	King's Lynn—Disinfectants, Stoneware Pipes, &c.	Corporation	H. J. Weaver, Borough Engineer, King's Lynn.
„ 31	Preston—Underground Convenience	Corporation	Borough Surveyor, Town Hall, Preston.
1902. Jan. 1	Kingston-upon-Thames—Two Filter Beds	Corporation	Borough Surveyor, Clattern House, Kingston-upon-Thames.
„ 1	Little Thurrock, Essex—Sewers, &c.	Orsett Rural District Council	R. T. Stewart, Surveyor, 2 Orsett Road, Grays.
„ 3	Marlborough, Wilts—Sewerage Works	Town Council	Fairbank & Son, 13 Lendal, Yorks.
„ 6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
„ 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
	TIMBER:		
Dec. 27	Dublin—Timber, &c.	Gas Committee	F. T. Cotton, Secretary, D'Olier Street, Dublin.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 27	Carnarvon—Steam Launch for 50 Passengers	——	E. Hall, Borough Surveyor, Guildhall, Carnarvon.
1902. Jan. 1	Gillingham, Kent—Laying-out Recreation Ground	£20, £10 & £5.	F. C. Boucher, Clerk to U.D.C., Gardiner St., New Brompton, Kent.
„ 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 15	Kirkcaldy—Elementary School (400 pupils)	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 20	Dublin—Water Supply and Drainage Scheme	£50.	J. O'Neill, Clerk to North Dublin R.D.C., Boardroom, North Brunswick Street, Dublin.
„ 31	Bangor—Infants' School	——	A. C. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
„ 31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
„ 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
„ 31	Newport, Isle of Wight—Queen Victoria Memorial	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
„ 4	Mountain Ash, Wales—Municipal Offices	£75.	J. Williams, Surveyor to U.D.C., Town Hall, Mountain Ash.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Gateshead—Board School	——	E. J. Harding, Clerk to School Board, Gateshead.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BOURNEMOUTH.—For works in connection with the Corporation tramways (Contract No. 14, engine-house, &c., and chimney shaft). Mr. F. W. Lacey, M.I.C.E., borough and tramway engineer:—

	£	s.
Engine-house.		
Martin & Co., Tonbridge	£16,326	10
F. Hoare & Sons	13,647	0
W. Hoare	12,819	0
F. Osman, Southampton	12,382	0
Jenkins & Sons*	11,719	0
Chimney shaft.		
Martin & Co.	£2,829	0
F. Hoare & Sons	2,430	0
W. Hoare	2,307	0
F. Osman	1,953	0
Jenkins & Sons	1,919	0
Myles & Warner, Stalybridge	2,694	0
Alphons Custodis Chimney Construction Co.,* Sheffield	1,215	0
Contract No. 15B—Car-sheds.		
B. Cooke & Co., Victoria Street, Westminster	£8,222	0
F. Osman	8,150	0
Jenkins & Sons	8,087	0
W. Hoare	7,810	0
W. E. Jones & Sons	7,748	0
F. Hoare & Sons	7,658	0
Jones & Seward*	7,640	0

* Accepted. [Rest of Bournemouth.]

COLCHESTER.—For the erection of Freemasons' hall in Abbeygate Street, Colchester. Mr. Chas. E. Butcher, architect, 3 Queen Street, Colchester:—

Harris & Rowe, Shoeburyness	£2,494
J. Grimes	2,400
A. E. Diss	2,301
R. Myall, Clacton-on-Sea	2,279
A. Diss	2,250
F. Rayment & Co.	2,247
E. West, Chelmsford	2,229
W. Chambers	2,189
G. Dobson & Son	2,180
T. J. Ward	2,165
R. Beaumont	2,117
J. McKay, Clacton-on-Sea	2,095
H. Everett & Son*	2,050

* Accepted. [Rest of Colchester.]

DURHAM.—For the erection of new printing and bookbinding works in Saddler Street, for Mr. Thos. Caldcleugh. Mr. H. T. Gradon, architect, Market Place, Durham:—

J. G. Bradley	£2,080	0
M. R. Draper & Sons, Leamside	2,000	9
G. T. Manners	1,995	0
Ayton & Caldcleugh, Newcastle-on-Tyne	1,912	0
T. Coates	1,863	0
G. Gradon & Son*	1,814	0

* Accepted provisionally. [Rest of Durham.]

EALING, W.—For the erection of "D'Eresby House," Ealing Common, W., for the Metropolitan Guarantee Society, Ltd. Messrs. Palgrave & C., architects, 25 Victoria Street, Westminster, S.W.:—

John Barker & Co., Ltd., Kensington	£20,342
L. Whitehead & Co., Ltd.,* Clapham	19,450
Mead & Burton, Chesham	18,360

* Accepted subject to modification.

GIRVAN (SCOTLAND).—For constructing a storage reservoir, with relative works, on the Pinmacher Burn, and for providing and laying about 1½ miles of cast-iron piping between Glendrishaig and Pinmacher reservoirs, for the Town Council. Messrs. J. & H. V. Eaglesham, C.E., engineers, Wellington Chambers, Ayr:—

	£	s.	d.
R. C. Brebner & Co., 4A St. Andrew Square, Edinburgh	£11,886	3	5
A. McLachlan & Son, Dalblair Road, Ayr	11,302	12	6
J. Urquhart, 118 Stevenson Drive, Shawlands, Glasgow	11,065	10	4
R. Stevenson, John Street, Ayr	10,831	6	2
W. Clarke, Sandgate Street, Ayr	10,298	4	9
Grisenthwaite & Newton, 18 Chatsworth Square, Carlisle	10,125	0	0
G. Reid & Son, Ayr	9,979	7	9
W. S. Osborne, Hawkhill, Ayr	9,642	2	9
H. Hastie, Monkton	9,513	8	11
T. Christie, Stirling	9,121	2	3
J. Osborne,* Hawkhill, Ayr	9,118	2	7

* Accepted.

HERNE BAY.—For the erection of 25 cottages. Mr. E. J. Hammond, C.E.M.S.A., architect, New Brompton:—

Mr. Welby	£6,075
E. T. J. Adams	6,050
Berry Bros.	5,576
L. Seager, Sittingbourne	5,500
F. Griggs	5,500
C. Jorden	5,375
J. Wilford, Snodland	5,125
J. F. Thompson, London	5,125
C. S. Smillie	4,875
A. S. Ingleton*	4,750

* Accepted. [Rest of Herne Bay.]

HULL.—For excavator, concretor, and bricklayer's work in the basement of the proposed new premises in King Edward Street, Hull, for Messrs. R. Field & Son, Ltd. Messrs. Brodrick, Lowther & Walker, architects, 77 Lowgate, Hull, and Central Chambers, Bridling:—

	£	s.	d.
J. Brunton, Dock Office Chambers	£1,464	7	7
Exors. of T. Southern, 18 Wright Street	1,204	1	0

T. Hannan, 9 Ragland Road, Leeds	1,205	0	0
E. Good & Sons, Ltd., Main Street	1,159	19	1
T. Goates, 39 Brunswick Avenue	1,153	0	0
T. Burrell, 6 Cleveland Avenue	1,144	14	4
H. Moody, 13 Somerscales St eet	1,133	14	8
J. Morrell & Son, 2 Landsdowne Street	1,129	18	3
H. Medforth, 49 Eastbourne Street	1,125	0	0
G. Jackson & Son, 36 Witham	1,088	5	0
G. Houlton, 6 Baker Street	1,075	0	0
M. Harper, 41 Brunswick Avenue	1,064	0	0
J. T. Levitt, 84, Holderness Road	1,049	0	0
F. Blackburn & Son, 61 Peel Street	1,045	17	4
J. R. Woods, Cleveland Street	1,040	10	0
Bowman & Son, 70, De Grey Street	1,016	16	0
A. Brunton & Son, Caroline Street	979	2	11
D. Robinson,* Freehold Street	978	0	0

* Accepted. [Rest of Hull.]

ILLOGAN (CORNWALL).--For the erection of proposed girls' school, &c., at Illogan Churchtown, for the Illogan School Board. Mr. Sampson Hill, architect, Green Lane, Redruth:--

Hosking, Townshend	£1,415	0	0
J. Odgers, Redruth	1,320	0	0
Opie & Hodge, Redruth	1,310	0	0
Mitchell & Hodge, Redruth	1,135	0	0
W. H. Moyle, Chacewater	1,050	0	0
J. Roberts,* Carn Brea	1,058	10	0

* Accepted.

KETTERING.--For the extension of the east and west outfall sewers, and for alterations to flushing chambers on the town sewers, for the Urban District Council. Mr. T. R. Smith, surveyor:—

East outfall.

Tate & Eastwood	£2,933	16	0
C. Chamberlain	2,699	16	0
Johnson & Langley	2,680	17	1
S. Lucas	2,678	4	5
Brown & Sons	2,653	16	7
Moss & Sons	2,643	7	10
Lock & Andrews	2,637	6	8
H. Weldon	2,626	18	6
J. Jackson	2,605	3	6
T. Philbrick	2,597	5	0
H. H. Barry	2,575	0	0
Holmes	2,559	9	4
Kettering Co-operative Builders	2,538	0	0
Johnson & Son	2,520	0	0
W. Cunliffe	2,487	8	0
Lewin & Son	2,425	0	0
F. Barlow*	2,423	0	0

West outfall.

Tate & Eastwood	2,404	12	0
C. Chamberlain	2,384	6	0
J. Jackson	2,233	13	10
S. Lucas	2,174	18	2
Brown & Sons	2,137	4	5
Moss & Sons	2,115	2	6
H. Weldon	2,112	7	1
Kettering Co-operative Builders	2,102	0	0
Lock & Andrews	2,082	5	10
Johnson & Son	2,078	0	0
Johnson & Langley	2,058	17	7
T. Philbrick	2,048	15	0
F. Barlow	1,991	0	0
H. H. Barry	1,983	0	0
Holmes	1,941	19	3
W. Cunliffe	1,941	18	7
Lewin & Son*	1,885	0	0

Flushing chambers.

Tate & Eastwood	1,407	0	0
J. Jackson	1,232	8	0
H. H. Barry	1,175	0	0
T. Philbrick	1,163	11	0
H. Weldon	1,148	0	0
C. Chamberlain	1,134	8	6
Brown & Sons	1,129	16	0
Holmes	1,109	10	0
Moss & Sons	1,099	13	0
Kettering Co-operative Builders	1,050	0	0
Johnson & Langley	1,045	5	0
Johnson & Son	1,005	0	0
Lock & Andrews	998	15	0
W. Cunliffe	997	18	6
F. Barlow	943	0	0
Lewin & Son*	914	0	0

* Accepted.

KIRKLEY (LOWESTOFT).—For the erection of a new congregational church, South Cliff, Kirkley. Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, architects, 5, Clements Inn, Strand, W.C.:--

	A. Church.		B. Tower.
Cornish & Gaymar	£2,200	10	£341
G. E. Hawes	1,767	0	320
Welham, Jr.	1,750	0	280
C. R. Cole	1,698	0	297
T. S. Smith	1,670	10	271
John Ashby,* Lowestoft	1,378	0	238

* Accepted. [Architects' estimate £2,000.]

LONDON.—For works in connection with the enlargement of the southern outfall sewer at Crossness Fall, for the London County Council:--

J. Cochrane & Sons	£124,949	10	0
W. Jones & Sons	115,699	9	0
B. Cooke & Co.	96,826	14	3
Bentley & Loch	82,597	4	0
Kirk & Randall	79,912	5	4
W. B. Squire & Co.*	73,980	2	7

* Recommended for acceptance.

LONDON.—For the superstructure of Block C, Reid's Brewery Estate, for the London County Council:—

Treasure & Son	£11,198
S. Redhouse	11,192
Spencer, Santo & Co.	11,078
E. Lawrance & Sons	10,806
Stimpson & Co.	10,733
B. E. Nightingale	10,646
McCormick & Sons	10,247
Martin, Wells & Co.	10,033
Holloway Bros.	10,090
H. L. Holloway*	10,020
R. M. Hughes, Birmingham	10,012
Hobbs Bros.	9,942

[Architect's estimate, £10,382.]
* Recommended for acceptance.

LONDON.—For providing and erecting three additional iron buildings and appurtenances on the Broadwater Road site, for the London School Board. Mr. T. J. Bailey, architect:—

Hill & Smith	£2,700
T. Cruwys	2,500
Humphreys, Ltd.	2,438
Croggon & Co., Ltd.	2,375
H. Harbrow	2,350
J. McManus	2,290
W. Bain & Co.†	2,040
D. Rowell & Co.*	1,920

† This firm has not included provisional sums in the tender.
* Recommended for acceptance.

LONDON, N.E.—For works for water supply at the workhouse and for the infirmary, comprising: (1) enlarging the existing well and lining with iron cylinders; (2) supply and fixing of two gas engines and pumping machinery; (3) erection of water tower; (4) supply and fixing of cast-iron tank, about 70,000 gallons capacity; (5) supply and laying of 6-in. mains, &c., for the Bethnal Green Board of Guardians. Mr. G. H. Hughes, A.M.I.M.E., engineer, 97 Queen Victoria Street, London, E.C.:—

R. D. Batchelor, 73 Queen Victoria Street	£6,733	18	10
Mayo & Haley, Norfolk Street, Strand	5,724	10	4
D. R. Paterson, James Street, N.W.	5,690	0	0
T. Tilley & Sons,* 451 Cambridge Road, London, E.	5,615	8	10
Timmins & Sons, Runcorn	5,422	16	6

* Accepted.

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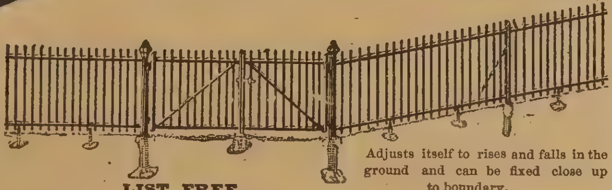

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TENDERS—*continued.*

HARROGATE.—Accepted for ornamental cast-iron work at New Kursaal for the Town Council. Mr. R. J. Beale, architect, Broadway House, London, S.W.

	£	s.
Lockerbie & Wilkinson, Ltd., Station Street, Birmingham, and 109 Victoria Street, London, S.W.	£882	10

LONDON.—For the erection of Aristotle Road School, for the London School Board. Mr. T. J. Bailey, architect:—

		A.
Holloway Bros.	£16,618	£339
F. & H. F. Higgs	16,247	181
Luthey Bros.	16,217	324
W. H. Lorden & Son	15,444	222
C. Cox	15,089	219
J. Marsland & Sons	15,425	180
Treasure & Son	15,274	190
J. Smith & Sons, Ltd.	15,035	200
Spencer, Santo & Co., Ltd.	15,014	170
W. Johnson & Co., Ltd.	14,700	155
E. Triggs	14,536	193
Holliday & Greenwood, Ltd.	14,535	204
J. & M. Patrick	14,359	212
J. Garrett & Son*	14,342	334

A. If walls of classrooms and halls are plastered, add.
* Recommended for acceptance.

LONDON, N.W.—For engineering works in connection with the new infirmary, Acton Lane, Willesden, N.W., for the Guardians of Willesden. Mr A Saxon Snell, F R I B.A., architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

	£	s.
W. Summerscales & Sons, Ltd., Keighlev	£11,436	0
T. Potter & Sons, South Molton Street, W.	10,093	15
J. & F. May, Whetsone Park, W.C.	9,870	0
Z. D. Berry & Sons, Westminster	9,515	0
Rosser & Russell,* Ltd., Hammersmith	8,923	0

* Accepted.

MERTON.—For additions to Merton School. Mr. H. G. Quartermain, architect, Kingston Road, Merton. Quantities supplied by Messrs. J. Leaning and Sons:—

	£
Gough & Co.	£5,200
Wall & Co.	5,123
Smith & Son	4,937
Holliday & Greenwood	4,884
Lorden & Sons	4,844
Garrett & Sons	4,800
Parsons & Townsend	4,647
Burges & Sons	4,495

NEW YORK (near BACKWORTH, NORTHUMBERLAND).—For erection of stores and tenement houses at New York, near Backworth, for the Shiremoor Industrial and Provident Society, Ltd. Mr. Eugene E. Clephan, architect, St. Nicholas Chambers, Newcastle-on-Tyne. Quantities by architect:—

	£	s.	d.
Ross & Son, 44 Brunswick Terrace, Gateshead	£2,765	18	3
S. Sherriff, Phœnix Joinery Works, South Shields	2,616	11	0
W. Tyrie, Redhugh Bridge, Gateshead	2,615	14	8
J. P. Bertram & Son, Farsdon, Newcastle-on-Tyne	2,479	17	6
J. Taylor,* Earsdon, Newcastle on-Tyne	2,284	17	5
J. Stobbs, Cramlington	2,212	15	9

* Accepted.

OTLEY (YORKS).—For the construction of a reservoir and works incidental thereto in the parish of Middleton, and about 2½ miles from Ilkley Station, on the Skipton and Ilkley branch of the Midland Railway, for the Otley Urban District Council. Mr. John Waugh, C.E., engineer, Sunbridge Chambers, Bradford:—

	£	s.	d.
Wilson & Son, Batley	£74,661	0	0
T. Smith, Bingley	56,750	13	7
P. Drake, Bradford	54,378	0	0
W. Binns, Bradford	47,500	0	0
T. Egan & Sons, Bradford	45,092	8	6
W. Brigg, Bradford	44,500	0	0
Arnold & Son,* Doncaster	49,500	0	0

* Accepted.

SOUTHEND-ON-SEA.—For the erection of two shops in Heygate Avenue, Southend. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend:—

	£	s.	d.
Baker & Wiseman	£1,795	0	0
E. West, Chelmsford	1,695	0	0
Golding	1,658	18	9
Ardley & Elvey	1,584	0	0
Moss	1,512	0	0
Shelbourne & Co.	1,492	0	0
Harris & Rowe, Shoeburyness	1,450	0	0
W. E. Davey	1,442	10	0
Stubbs	1,382	7	0
J. Band,*	1,360	0	0

* Accep'ed, after amendment. [Rest of Southend on-Sea.]

WEST HAM.—For making-up the following streets, for the West Ham Town Council: Group 1—Chandler Avenue, Waghorn Road, Tunmarsh Lane; Group 2—Kelly Road, Ravenscroft Road, Carson Road, Douglas Road. Mr. John G. Morley, borough engineer:—

	£	s.	d.
Group 1.			
W. Griffiths & Co., Ltd., Hamilton House, Bishopsgate Street	£2,858	0	2
T. Adams, Green Lanes Goods Station, Wood Green	2,637	4	9
J. Jackson,* Broadway, Plaistow	2,610	7	3
D. T. Jackson, 104 Ripple Road, Barking	1,749	17	2
Group 2.			
D. T. Jackson	3,502	11	0
W. Griffiths & Co., Ltd.	3,491	5	6
W. H. Wheeler, 235, Blackfriars Road, S. E.	3,442	7	7
T. Adams	3,311	19	2
E. Beech, 58, Malmesbury Terrace, Canning Town	3,254	9	4
J. Jackson*	3,082	0	8

* Accepted.

WEST HAMPSTEAD, N.W.—Accepted for the completion of "King's Gardens," Hampstead, for Herbert Kempson Reeves, Esq. Messrs. Palgrave & Co., architects, 28 Victoria Street, S.W. Quantities by Mr. C. E. Pease, P.A.S.I.:—

	£
C. Gray & Co., Shepherd's Bush	£33,750

WINCHFIELD (HANTS).—For alterations and additions at the Workhouse Infirmary, Winchfield, for the Guardians of Hartley, Wintney Union. Mr. H Townley Sugden, architect, Eversley, Winchfield:—

	£	s.	d.
W. Smith, Farnborough, Hants	£1,362	0	0
Newland & Higgs, Surrey Works, Cobham, Surrey	1,320	0	0
Poulter Bros., Fleet, R.S.O., Hants	1,267	6	3
McC. E. Fitt, 118 Oxford Road, Reading	1,165	0	0
Spear & King, Crowthorne Berks, and Fleet, Hants	1,123	0	0
G. Hooker, Mark Lane, Basingstoke	1,095	0	0
Pool & Sons, Hartley, Wintney, Winchfield	1,075	0	0
Mussellwhite & Son, Basingstoke	1,064	0	0
J. Harris, Basing Road, Basingstoke	1,032	16	9

No tender accepted at present.

WHITLEY (NORTHUMBERLAND).—For the whole of the works required for forming, making, and completing a new road, about 300 yards in length, with stone parapet kerb and iron railings and other contingent works in continuation of the promenade at Whitley, for the Whitley and Monkseaton Urban District Council. Mr. J. P. Spencer, C.E., surveyor, 30 Howard Street, North Shields:—

	£
J. Wardlaw, South Shields	£2,600
G. Thornton & Co. South Shields	1,334
J. & R. Johnson,* Whitley Bay	1,217

* Accepted.

WALSALL.—Accepted for constructional iron work for the New Municipal Buildings. Mr. J. S. Gibson, architect, 4, Gray's Inn Square, W.C. Messrs. Armitage & Hodgson, contractors, Leeds.

	£	s.
Lockerbie & Wilkinson, Ltd., Station Street, Birmingham, and 109 Victoria Street, London, S.W.	£1,152	9

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17¼ × 3 × 2	8 11	8 2	12 6
17¼ × 3 × 1½	6 10	6 3	9 6

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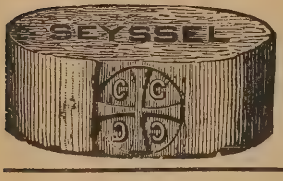

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NO. 360.

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An Architectural Causerie.

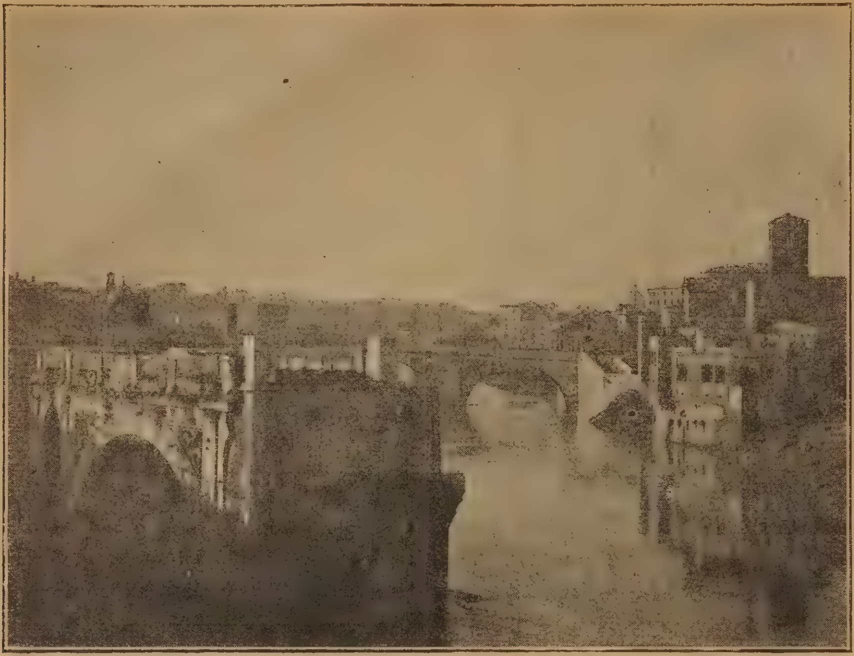
The Past Year. A LARGE picture cannot be judged by standing close to it. If (like Frith's) the technique is so marvellously minute that a close inspection is demanded, the picture must almost inevitably fail in grandeur when viewed comprehensively, because whatever charm there may be in the detail will be lost, and instead of a bold effect there will be nothing but pettiness; whereas, if the artist treats his subject in a noble manner the seeming coarseness which might appear on a close examination is seen to change to massive outline and generous breadth when the work is viewed in its entirety at a distance. And of architecture the same may be said—that it is quite impossible for men to take measure by a contemporary standard, because they are under the same influences as those whose work they are estimating, and though it may seem perfectly right to them in their own time, posterity may pronounce it wholly wrong; and posterity, being unhampered by details and surveying the whole ground instead of a portion of it, is likely to be right. For example, we are able to measure the Gothic Revivalists more correctly than their contemporaries could; we see the folly of their expectations, but they did not; just as, in another way, Evelyn in the eighteenth century spoke of Gothic architecture as crude, unconstructional and barbarous, whereas we know that it displays the most wonderful construction in all architecture and has produced the most lovely forms that could possibly be created by human hands. Looking back therefore on the work of the past year it is quite impossible to define limits of advance or retreat; the only indications which may be observed are general indications—the prevalence of this particular treatment or the absence of that—and in this broad way it seems that architects are improving and that their works, being designed more according to constructive and utilitarian requirements, do not suffer so much from the mistakes that were so common twenty years ago; and it is in the continuance of these methods that we may hope for future improvement. Architects are being trained better; they know more about the why and wherefore of things; and consequently they use materials more truthfully and logically.—Undoubtedly the most important architectural event of the year has been the limited competition for the National Memorial to Queen Victoria, which first became generally discussed in March last, when the Buckingham Palace site was selected. At the present moment, with the fund standing at less than £190,000, the completion of Mr. Aston Webb's design is not hopeful, considering that the greater portion of such sum would be needed for the memorial itself. Other competitions in various parts of the country have furnished other results—some good, some bad. At the beginning of the year the Glasgow Royal Infirmary competition showed how committees can abuse their priviliges—in this case it will be remembered they put aside the award of their assessor (Dr. Rowand Anderson) and followed their own judgment, which happened to be attached to a plan that was an elaboration of one of the two sketch plans prepared by two members of the Committee who (to quote the Glasgow Institute of Architects) "have not enjoyed the training which would qualify them as surgical, medical or architectural experts." Then there have been competitions for infirmaries at Bristol and at Hull, a workhouse and a town hall at Stockport, a fire-station at Manchester, new municipal buildings at South Shields and at Hereford, a dental hospital at Birmingham, a polytechnic at Hackney, and, most recently, public baths at Camberwell. During the year considerable interest has centred around the new Government offices now being erected in Whitehall, the proposed cathedral for Liverpool, the alteration to London Bridge and the subsidences at St. Paul's Cathedral, the Kew Cowl tests, the various housing and other schemes of the London County Council, the widening of Piccadilly, the Richmond Hill view, Christ's Hospital, the condition of the building industry and the effect of trade-unionism on bricklaying, and numerous other matters of a kindred nature, the pros and cons of all of which have already been discussed in these columns. At the Royal Academy the architectural room furnished no design of great moment, though the domestic work was, on the whole, extremely pleasing. The Building Trades' Exhibition proved to be the best as it was the largest yet held, though the conference with regard to the standardization of bricks was inconclusive and not likely to result in any change. In the following month (May) the great exhibition opened at Glasgow, an exhibition which was a financial and architectural success. Among the numerous papers read before the various architectural and engineering societies during the past year there were many of considerable value and interest; but it is to be regretted that, in view of the fact that they are written by such acknowledged authorities, they are not read as widely nor as closely as they deserve. Perhaps the most important of those given before the Royal Institute of British Architects were Mr. G. T. Hine's on "Asylums and Asylum Planning," Professor Flinders Petrie's on "The Sources and Growth of Architecture in Egypt," Professor Lethaby's on "Education in Building," and Mr. Francis Bond's on "The Classification of Romanesque Architecture." Of the Architectural Association papers may be noted, Mr. Max Clarke's on "The Sanitation of a Country House," Mr. H. B. Measure's on "Rowton Houses," and Mr. Alfred Hands's on "The Protection of Buildings from Lightning.

THE FORUM FLOODED, 1900; FACING NORTH-EAST.

In reviewing the events of the past year reference should be made to the changes effected in connection with THE ARCHITECTURAL REVIEW. The fact that this—the only monthly magazine of its kind in the country—is produced under the direction of an advisory editorial committee comprising some of our best-known and ablest architects, augurs well for its future.

Several well-known names have needed to be struck off during the year—J. M. Brydon, Arthur Cates and Ebenezer Gregg (all of whom died in May last), Yeoville Thomason (July), James Brooks (October), C. J. Innocent (November) and Onslow Ford (December). The following are the most notable new books published during the year (irrespective of new editions):—"Early Renaissance Architecture in England" (Gotch), "A Short History of the English Renaissance" (Blomfield), "The Later Renaissance in England" (Belcher and Macartney), "Some Architectural Works of Inigo Jones" (Triggs and Tanner), "The Decorative Work of Robert and James Adam" (Batsford), "Dictionary of Architecture and Building, Vols. 1 and 2" (Sturgis), "London Housing, 1855 1900" (L.C.C.), "Building Specifications" (Leaning), "A Price-book for Architects and Engineers" (Coleman), "Die Englische Baukunst der Gegenwart" (Muthésius), "The Georgian Period" ("American Architect"), "The Origins of Art" (Hirn), "The Double Choir of Glasgow Cathedral" (Watson), and "Modelling" (Lanteri). With regard to the building industry itself, this has been most depressed throughout the country, due to the effect of the war and the consequent scarcity of money, and the continued high prices of materials; and there seems little indication of improvement.

It is usual to speak of the future with hope, and so far as architecture in this country is concerned, it may well be said that so long as those who practise it endeavour, as many are endeavouring, to design with knowledge and to suit everything to requirements, so long will there be a tendency to improve, which tendency is entirely dependent for its strength on the collective ability of architects and the betterment of taste among the official and lay public. There is yet much to be done, and the difficulties in the way are many and great; but they are not insuperable.



PONTE ROTTO WITH THE TIBER LOW.

NOTES ON ROME.

By MAUD BRETTINGHAM (Rome).

ROME of to-day is being subjected to a double and strangely incongruous process—that of demolition and reconstruction. While archæologists are feeling their way to the old level and carefully sifting every spadeful of earth, only a few yards away architects are erecting new buildings and piling bricks and mortar over historic ground and hidden treasure. Take, for instance, the Forum, where Professor Boni has been doing such splendid excavation work of late, and of which many particulars have been published in these columns from time to time. On the other side of the Capitol the State is erecting a monument to Victor Emmanuel, of such colossal proportions that it will require a decade before there is money enough to complete it. Rome, since (unfortunately for historical research) it was chosen as the capital of Italy, has more than doubled its population, and has contracted a loan of 150 million liras for public works. The state has undertaken to erect the "Policlinico," the "Palace of Justice," the embankment of the Tiber, several bridges, Via Cavour, and the monument to Victor Emmanuel. With regard to the embankment of the Tiber, the accompanying photographic illustrations show very forcibly how much the work needs to be completed. During the last inundations, just a year ago, the rise in the Tiber is illustrated by the photograph of Ponte Rotto as compared to that taken in normal times. The standing pier is the last remnant of an old Roman bridge in Rome. It was the Pons Æmilius of 573. This, the oldest bridge, was wantonly destroyed in 1886 by the embankment work then going on.

When the rains had ceased, a picturesque scene was afforded by the fourth-century church of St. George in Velabro, standing deep in water, but casting so perfect a reflection in the brilliant sunshine as to make it almost a puzzle to determine where the real ceased and the reflected began.

It is interesting to note, with regard to the Forum in its present state of excavation, that the old prints up to the beginning of this century show us little more than the capitals of the remaining pillars of the highest temples as alone visible above ground. In the seventeenth century many learned works appeared on the Forum, and "closet scholars" exercised their brains on its topography, while it remained buried beneath their feet. Thus, up to the present date all works written in the dark have become more or less obsolete in the light of the discoveries of to-day. It was reserved to the nineteenth century to bring the Forum once more to the light of day. The work of excavation was begun in its second decade by the French, who, then in occupation, were eager to obtain statues and other treasures as plunder. On their departure the Duchess of Devonshire obtained leave to carry on the work; and now within the last twenty-five years the Italian Government have slowly and surely continued it. To-day, as cartload after cartload of earth is painfully drawn by horses and mules beyond the Arch of Titus over a heavy road, there can be no more interesting sight in the world than the hourly laying bare of the great Foro Romano.

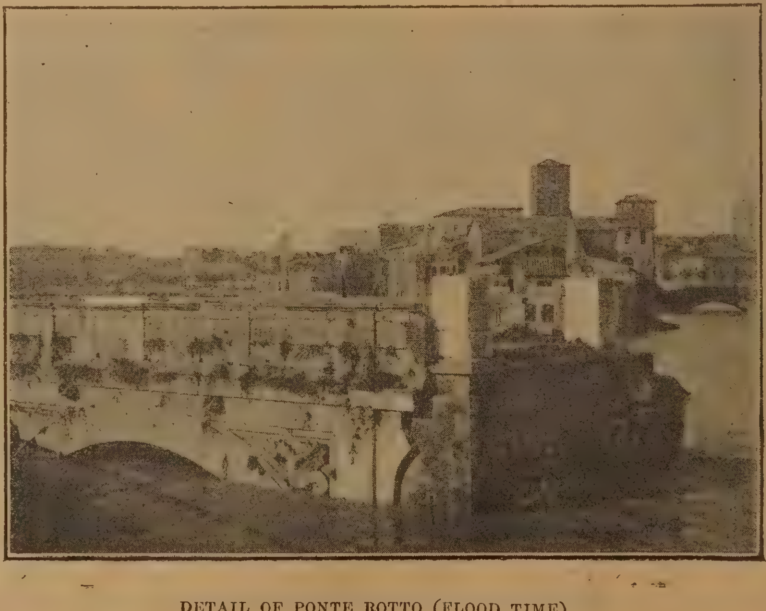
It is marvellous how small the Forum was: 260yds. long, and 140yds. wide at its widest, beneath the Capitol.

Considering its limited space, the marvel is that so many temples, basilicas, columns, triumphal arches and rostras could possibly have found place in it; but from the latest plans we see that the principal temples were raised on lofty platforms, thus gaining in height what they lacked in expansion; that the other temples were small shrines; and that the only available free space was in reality the Comitium, in which, just at the foot of the Arch of Septimus Severus, the discovery of slabs of lapis niger gave rise to the belief that the tomb of Romulus had been found. This notion has now been discarded; and though tradition and Varro give this spot as his burial-place, we cannot reasonably expect to find any remains of the son of Mars.

Another point of special interest is the excavation at the base of the temple of Saturn, beneath which the treasury was deposited, as recorded by Plutarch. Just outside the Forum proper, on the right of the Via Sacra towards the Arch of Titus, is the base of the temple of Vesta, a discovery of late years, and, closer under the Palatine, the House of the Vestals, the most secret and sacred spot in Rome. Reminiscences can be traced very perfectly. Here in the Atrium are the foundations of the shrine which contained the Palladium, "by no male beheld" (Lucan)—a statuette of Minerva from Troy. In this most interesting ruin many statues of vestals are propped against the walls, and it is damp and dank as in the time of the Emperors, when on account of its sunless, covered-in position, close under the Palatine, it had to be heated with hot air and water, the appliances for which have been traced.

The most picturesque discovery of the past year, or rather the one which appeals most strongly to the imagination, is that of the subterranean galleries running north and south and east and west under the heart of the Forum, in the space between the Black Stone and the Basilica Giulia, immediately in front of the Rostra. These galleries are 10ft. high and 4ft. broad. They lie about 1ft. below the surface of the Forum, and communicate with the air by openings large enough to admit of the passage of a man. At distances along the galleries there are square chambers large enough to admit apparatus for working a kind of windlass, and the sides of the openings are worn down by rope marks—a sign that heavy objects must have been raised and lowered through them. The most probable explanation is that the galleries were used as an *armamentarium* during the Cæsarian games which took place in the Forum prior to the construction of the amphitheatre. The most probable date of their construction is about 45 B.C., during the lifetime of Julius Cæsar. For the present the examination of the galleries has had to be suspended owing to the infiltration of water, but as soon as the municipality has arranged a proper outlet for the Cloaca Maxima, operations will be resumed.

The Parish Church of Haconby, Bourne, has recently been reopened after a thorough restoration, at a cost of nearly £2,300. The Earl of Ancaster has paid for the restoration of the chancel and side chapel, the tower, and the provision of seats for the chapel, which altogether cost his lordship upwards of £1,100. The whole of the work has been carried out to designs by Mr. C. A. Passett-Smith, the architect; and Mr Halliday, of Stamford, was the contractor.



DETAIL OF PONTE ROTTO (FLOOD TIME)

ULSTER SOCIETY OF ARCHITECTS.

THE annual general meeting in connection with this Society was held recently. Sir Thomas Drew (president) presided.

The president, in the course of a brief address, congratulated the Society on the progress it had made and the good work it had already accomplished. Mr. W. J. Gilliland, vice-president, afterwards submitted a report, which stated that since July 22nd last there had been five members, seven associates, and six students elected, and that there were several others on their way through the Institute, their names being on the ballot papers at present. The report concluded as follows: "The Belfast City Corporation, with a desire to improve the street architecture of the city, propose to include in an omnibus Bill which they intend to promote in the coming Session of Parliament a clause to regulate the 'elevations of buildings.' By a hastily-drawn and ill-considered clause they propose to cut the Gordian knot of a difficult problem by making the city surveyor the universal architectural censor for the city. Your Council have protested in the strongest way against this intolerable tyranny, and they will persist in their opposition, in which they expect the support of every member of the Society until this objectionable proposal is withdrawn. A very substantial section of the Corporation—that which understands the subject best—is with us, and we have no doubt that we shall bring others to see that, far from producing a desired and desirable improvement, the result of giving a city surveyor such powers would be most unsatisfactory, and indeed unworkable. In conclusion, I would again urge on every member the desirability of giving loyal support to the Society in every way possible, and remind them specially of the undertaking which each has signed by which he promises to attend all meetings of the Society whenever at all convenient."

The following were then elected:—As member, Mr. James A. Hanna; as associates, Messrs. J. Bevin, W. C. Maxwell and C. D. Patterson; as students, Messrs. D. Parkhill and J. Seeds. The following officers were elected for 1902:—President, Sir Thomas Drew; vice-president, Mr. W. J. Gilliland; hon. secretary, Mr. N. Fitzsimons; hon. assistant secretary, Mr. W. B. Fennell; hon. treasurer, Mr. Vincent Craig; council, Messrs. J. J. M'Donnell, M. A. Robinson, F. H. Tulloch, W. J. Fennell and Henry Seaver.

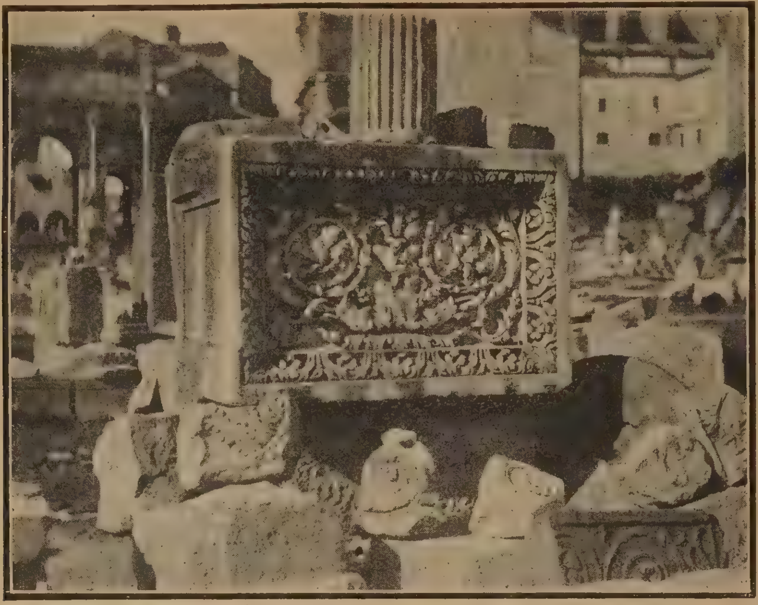
The annual dinner was afterwards held, Sir Thomas Drew (president) in the chair.

The president, in reply to a toast, said if he might be permitted to allude to current affairs, he noticed they had already found themselves face to face with questions of very great gravity to their profession as well as to the public of Belfast; and he had no doubt when in time they came to be better recognized their organization would be an exceedingly useful one, working in harmony with the municipality. That was the case in Dublin, where there was a kindly feeling existing between the architects and the Corporation. In all the legislation promoted by the Dublin Corporation in which architects were interested they had invariably been consulted. In Belfast there was a question which affected them. A Bill had been promoted in Parliament which would in some points affect the practice of architects in this city, and there had been put into his hands that night for the first time a draft which was proposed. Among other things it stated, "The surveyor may disapprove of such elevations on the ground that they are, in his opinion, objectionable, or that in any respect they are not in conformity with the requirements or provisions of the existing local Acts or by-laws of the Corporation." That was certainly a most extraordinary clause, and, he feared, was drafted under a total misapprehension and mistake. The draftsman of such a clause could not possibly have conceived what the ultimate result would be and how it would affect architects. In the first place, could he have thought what a blow it was to the liberty of the free subject in this free kingdom? Municipal laws as regarded buildings were no novelty. Parliament had been hammering away at them for fifty years, and, after many amendments and new Acts, municipal legislation as to buildings was in a pretty concrete state. The City of London had a system which, with all its faults, was as nearly perfect as it could be. The Local Government Board of England had issued model by-laws, which had been adopted by even the smallest urban authorities in the smallest towns. While the great municipalities of England had their legislation and their by-laws pretty well now in smooth working order, he ventured to say in no part of the King's dominions would such a clause as that proposed by the Belfast Corporation be found. It would be impossible. He remembered in former times such a thing was once attempted in Dublin illegally. The thing was at once put down with a high hand by public spirit. A tyranny of that kind exercised by a city officer on the free right of citizens to build on their own land in the proper way could not be tolerated for one moment, as it was a violation of the principles of freedom in this country and at variance with all municipal laws. That was a lesson, and the Corporation of Dublin had never attempted to take any such powers again. He doubted if they would be granted by the Legislature if proposed. Those things which were really objectionable and offensive in property were regulated by the ordinary legislation in towns, and the precedents he had quoted were quite sufficient to meet them. The general powers given to municipalities as to frontage lines and the widening of streets were quite sufficient and worked very smoothly. Then, again, if such a preposterous clause as that proposed were

TEMPLE OF VESTA.

PONTE ROTTO, REMAINS OF PONS ÆMILIUS, AND THE ISLAND ON THE TIBER.

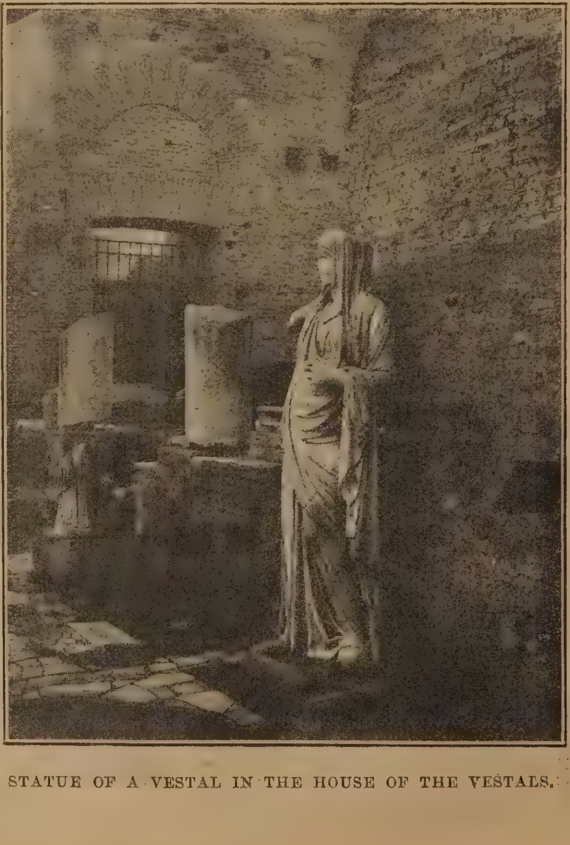
S. GEORGE IN VELABRO.



FRAGMENTS FROM THE EXCAVATIONS IN THE BASILICA ÆMILIA.

adopted, who was the surveyor that he should be censor of architecture any more than that of morals? What were his qualifications for the position? He was not an architect as a rule. He (Sir Thomas) should also be very sorry indeed to see a censor of architecture appointed, although he might be a distinguished architect. They had all ideas of their own as to how things should be done. They should remember how that kind of thing was met in London under the Metropolitan Building Acts. There was a court of arbitration, consisting of three professional men, and their decision was the rule for the County Council. On mere questions of taste and architecture there should be no censor. Such a thing was foreign to the whole spirit of the British trader, and at variance with the free spirit of the country. If such a thing were imposed it would be to the detriment of the architectural progress of the country. He hoped there would be sufficient good sense on the part of the Corporation of Belfast not to insist upon the proposed clause, and that a pen would be drawn through it before it became a public and burning question. It would be more creditable to the common sense of this city if that clause was drawn simply on the lines of other municipalities, and then there would be no more heard about it. If it, however, should be presented to Parliament he was sure the architects of the city would take steps to oppose it. It would be their duty to do so, and he could promise that in their opposition they would have the assistance of the Royal Institute of British Architects and of the allied societies throughout the kingdom. He sincerely trusted the by-laws of his native city would be model by-laws, and that the architects and Corporation would work in harmony together.

A New Bank at Dorchester has been erected in South Street, for Messrs. Stuckey's Banking Company. The entire premises have a frontage of 49ft., and a depth to the garden behind of 100ft. The bank is built in ashlar work of Ham Hill stone, while the residental premises behind are built of the best Wellington brick. The building was designed by Mr. G. H. Oatley, architect, of Bristol, and built from his plans by Messrs. Henry Pittard & Son, of Langport. The figure carving in the gables was done by Messrs. Davey & Bushell, of Bristol. The bank fittings have been put in by Mr. G. Gane, of Bristol; the tiling done by Messrs. Carter & Co., of Poole; the wood-block floor laid by Mr. Ebner, of London; and the electric bells fitted by Mr. W. J. Durden, of Dorchester.



STATUE OF A VESTAL IN THE HOUSE OF THE VESTALS.

NORMAN ARCHITECTURE.

MR. J. T. FOURACRE delivered a lecture recently at the Plymouth Institution on "Norman Architecture." Remarking that the style of the Norman period of building had not had sufficient attention paid to it, the lecturer held that it could hold its place in comparison with the best architectural achievements. He did not claim for the ornamental details the beauty of the succeeding periods; there was what would seem now almost a barbaric character in some of the early ornamentation, but, for solemn grandeur and beauty of proportion, Norman design had been surpassed by few styles. The buildings, or rather the remained fragments, a silent witness of their energy, skill and masterful handicraft in the sublime art of building. Historians consented that for general comparison with the other nations of Europe the Normans were eminent, if not superior, with respect to civilisation and the arts. Among the prelates in the early Norman reigns were found men of consummate skill in architecture. Their influence in England must have been enormous. No sooner were the Norman settled in this country than churches, cathedrals and castles were sown broadcast throughout the land. A large body of masons and other craftsmen must have been raised, more skilful than ever existed in the country. Some of the most skilful, no doubt, came from Normandy. When Lanfranc came to England and found his cathedral of Canterbury in ruins from the fire of 1067, he re-erected it from the model of his Church of St. Stephen at Caen. Where did he get his models from originally? Did they not come from Lombardy? What was termed Norman architecture did not spring up entirely on Norman soil; the Lombardic influence could be clearly traced. Mighty men like Lanfranc, Anselm, and others, brought with them a train of working monks from beyond the Alps. They influenced the Normans, who, in turn, by their progressive ideas and aptitude, perfected a school of architecture. Lanfranc must have had good experience in building prior to his coming to England. He probably worked at building with his own hands on the monastery at Beck when it was enlarged. There was not the slightest doubt he studied architecture. The style which grew up in Normandy during the early years of William was brought into England in the days of Edward the Confessor; it was merely strengthened on to perfection after William's coming. That the rebuilding of the West-Minster marked the beginning of Norman architecture was an acknowledged fact, and it long remained the great model of the style, the object of imitation for English architects even in the following century. The degree of ornament and finish in workmanship was not always a question of date; it was often a question of taste and means of the builder. William of Malmesbury said the Normans, by their arrival, revived the observances of religion, and they might see churches rise in every village and monasteries in the towns and cities built after a style unknown before, and the country flourishing with renovated rites, so that each wealthy man accounted that day lost to him which he had neglected to signalise by some magnificent action. It was known that these remarks correctly described the great building wave that swept over the country; they could hardly go into a town or village but some remnant of the Norman builder, some old arch or pier or sculptured stone, showed how busily the builders must have worked. The solemn stateliness of Norman buildings was heightened by the use of artificial light. He purposely visited Tewkesbury Abbey during an evening service to see the effect at night, and was quite charmed by its grandeur. Pointing out the strong affinity of Norman ornaments to heraldic partition lines, the lecturer went on to speak of the doorways as one of the glories of the Norman styles, suggesting that their beauty might account for so many hundreds remaining; they seemed to have been preserved even through all alterations of style. The Norman period of architecture, so bold and assertive, although existing barely a century, gradually changed into a style when the masses of stonework were broken up into smaller surfaces, and when another manner of decoration by sculpture came into use. Gradually thrusts and stresses were understood; and while the utilitarian might urge that a needless waste of material occurred in the earlier work, it must remain, to those who were privileged to admire even the mutilated remains of these masterpieces of architecture, somewhat a question of the trend of the mind of the spectator. Could they see the interior of one of these old minsters, with its dimly-lit choir and altar high up nestling amongst a cluster of columns, the massive wooden roof, all strong with heavy oaken timber, besprinkled with quaintly-devised patterns in strong colour, with curiously-wrought devices worked in glass, and, indeed, the building in its entirety, then, and not until then, could Norman architecture be said to be presented aright to their judgment.

OUR TECHNICAL LITERATURE.

BY X.

THOSE who have had occasion to look up written "authorities" upon any branch of practical building have, no doubt, been made painfully aware of the scarcity of really comprehensive and useful works upon the subject of their study, or at least, the inadequacy of such books as they may find. Let me not be misunderstood. Of works of a class that emanate from the college or the laboratory (including those dealing with the various departments of mechanics and the physical characteristics of building materials) we have an embarrassing abundance, consisting for the most part of works of accuracy and completeness, while electricity has been dealt with in an equally amazing array of books, good, bad and indifferent. But of comprehensive and trustworthy books on actual building practice fit to place in the hands of our students and practical workers—which books are the subject of this article—there is both great scarcity and pressing need. The Government has done much to aid the student, but it has left the most essential element—books—to chance writers, whereas it should have been their first duty to produce at any cost such important factors in the progress of civilization. I am aware that our Transatlantic friends have given us several excellent practical treatises—and those students able to take advantage of German and French publications will find several very instructive works in those languages—but even these do not fill the gaps or meet "the long-felt want" in our educational circles. We have, it is true, a few very carefully compiled general text-books, designed as class books to suit certain progressive "courses" of study as laid down by the Science and Art Department; but these books are compilations only, and cannot by any stretch of imagination be counted as "authorities." Their scope is necessarily limited, and their information scrappy, inconclusive and often inaccurate. They are very suitable for the man whose course is coached and whose aim is "to pass," but the genuine student with a higher object in study is all too soon worried by their inconclusive theorems and anomalies, and often driven by them to repeat that venerable and still unanswered question, "What is Truth?" It is at this point that his necessity for proper "authorities" arises. He should be able immediately to refer to some accredited work or works, and so clear up his difficulties. Let him try it now, and in the majority of cases he will either fail to find what he wants, or find only that which will puzzle him the more. I am writing from sad experience. Incredible as it may seem (just to illustrate my point with one case), it is nevertheless a fact that there was not an English work worth reading on the subject of the ancient and wide-spread craft of plastering until Mr. Millar produced his recent work. The need that existed for such a work was demonstrated by, as I am informed, the almost immediate exhaustion of the first edition; and that other countries were similarly pressed was indicated by the large number of copies of the book that have been sent to the technical schools of Germany and elsewhere. There are several most excellent and complete books on practical plumbing, both English and American, and two or three good works dealing with other branches of the building trade, but the cycle is very incomplete; and as long as it remains so, so long will the rising generations of students be handicapped. No one should expect or desire a smoothly-paved royal road to learning, still less one that is "coach"-ridden; a rough road stimulates attention, and is not so readily forgotten as a smooth one; but it is the impassable chasms that need to be bridged, so that the road may be at least possible to those who would climb it.

Fifty years ago we reared our craftsmen differently. Knowledge was private property; it was bought and sold like other purchasable articles, and transferred in whispers to those who bound themselves by deed to keep the secrets—such as they were—inviolate. I can remember when every joiner's shop had its lock-up sanctum for the learned staircase hand and for other branches who made mysteries of their craft. In those days, too, magistrates had their regular morning batch of refractory apprentices much as they now have their "drunk and disorderlies," and the few books that were available, though useful as far as they went, were ridiculously imperfect and inadequate. But we have changed all that. The secrets are published from the house-tops, and the poorest student can have free access to all that our forefathers guarded so jealously. "Indentures," which used to be the "open sesame" to employment, are now seldom or never asked for in engaging a "hand"; and our modern technical classes and colleges (and more particularly the cheap books and the free library) are gradually subverting the older custom. Yet, however good and numerous the means of personal teaching, it is the book which is the student's best friend; and when our technical literature, now in its infancy, shall have grown to a useful and more complete manhood, it will become an all-powerful aid.

THE FORUM FLOODED, 1900; LOOKING TOWARDS THE COLOSSEUM.

TEMPLE OF SATURN, THE FORUM, ROME.

Who does not remember as a youth the confidence he placed in any printed technical information that came to him, and the awe with which he regarded the profound wisdom and learning of his preceptors. A single statement at such a time would influence his opinions and judgments for good or harm for many years after, so that one cannot overstate the importance of having teachers that are capable and books that are trustworthy; but doubly so the latter, for if we have the proper books there will be much less excuse for badly-informed teachers. One could hardly estimate the enormous influence for good that a really good technical book has upon national progress. It has hardly been thought of, much less calculated, but if this fact could only be fully appreciated the establishment of a complete technical library of the very best possible kind would soon be recognised as a national duty and a *sine quâ non* to the national welfare. That such a library is possible even in the present generation there can be no doubt, for never before were practical men more capable or better educated. Is it not, then, high time that the present *laisser faire* policy of book-producing were abandoned in favour of some systematic policy? Why cannot the right men be sought out and set to work on the construction of a library of such urgency and importance, and, one might almost add, on the destruction of the stumbling blocks in the way of technical literature that publishers still continue to advertise?

I may divide our possible authors into three classes:—(1) Those who know and don't write; (2) those who write and don't know; and (3) those who both know and write.

Anyone who is tolerably well-connected in building circles will easily be able to attach for himself a list of names to each of these classes.

(1) The first-named class includes those who (as suggested) should be "sought out and set to work." Very many clever and skilful men are here, but unfortunately they have but a limited influence over the world of students; they hide their light under a bushel, and it is buried with them. Even if they had the inclination they cannot afford the time to give the world the benefit of their experience—unless, of course, they made it their business to write—and if they did that they would be justified in expecting compensation for their time and labour commensurate with that which they would have received from their business so sacrificed.

(2) The second division is a motley crew, including almost every class of person. Among them is the young architect, whose brass plate is painfully new, passing the hours of weary waiting for business, and hoping, like his relative, the briefless barrister, to catch clients by writing a book. He may serve his immediate purpose, but cannot serve the community in that way; such a book, fortunately, is likely to die young. Then there is the versatile journalist who would write about the construction of a cathedral or the breeding of pigs with equal facility, but his brilliant articles, while they scintillate like fireworks, like them leave nothing behind. Another type is the young man who has succeeded in passing his first examination. It is enough. He forthwith starts in business as a professional "coach." To obtain prestige he writes a book, and he will venture to answer queries in trade journals upon practical subjects of which he has only a paper acquaintance. It is easy for any enquirer to obtain learned answers from this gentleman when the question is within the four corners of a text-book, but when a

BAS-RELIEF IN MARBLE: ANIMALS "PREPARED FOR SACRIFICE."

PART OF THIS BAS-RELIEF.

practical difficulty is propounded the answers are often *pour faire rire*, unless he is canny enough to hedge.

Less harmful and more honest is the man entirely outside the profession who works on a hobby and writes about it. If, like Mr. Charles Hood, the barrister, who wrote a work on hot-water circulation, he confines his remarks to what he really know his work, like that gentleman's, may become useful. But the temptation of such men is to go beyond their experience and at once to bring discredit upon the more valuable portion of their work. Finally, the worst type of all is that of the man who has earned a name for his knowledge and attainments in certain branches, but who is indiscreet enough to prostrate his good name and risk his reputation upon subjects of which he has but a nodding acquaintance. The further that technical knowledge advances, the narrower must become the range of subjects to any one professor—be he author or teacher—if he would do full justice to the subject of his choice.

(3) The third class is a small one. It consists for the most part of busy men who manage somehow to find time to do something to help others, although the element of charity does not always enter into their motives for writing. One man may wish to extend his present position and influence by a technical work, intended as a species of advertisement; another may be ambitious simply to leave a name behind him. But in either or any case, if the subject chosen happens to fill a want and his work is the result of long experience and painstaking effort, the world will be thereby the better. The best results have been obtained by men who have been keenly conscious of the need of a book, who through years of careful observation and hard-earned experience have spared neither pains nor expense to perfect their design and to gather together the materials for what is generally almost a life-work. Any book that is to make its influence felt is bound to involve so much personal sacrifice that, in the present state of things, there can be little hope of anything like an adequate reward unless it be of that kind that feeds the soul rather than the stomach; and happy is the author whose heart is great enough for him to be amply satisfied with such a reward.

But why, when so much public money is spent upon education, should we have to depend upon charity and chance for our essential literature—that which is and is to be the anchor and safeguard of education? These things ought not to continue to stand where they are, for the remedy is easy, though it may take some time to become an accomplished fact—a sufficient reason why it should be commenced at once. I admit that my proposal may be open to objection, but so is every proposal involving expense. Let the Educational Department form a Commission with ample powers to gather together a band of technical experts, gathered, not simply from existing technical schools but from amongst the men who are in actual practice, regardless of nationality. "Those that know" should be found; and if they are unwilling to sacrifice a lucrative business or profession for the sake of the general good, they should be offered sufficient inducement to enable them to do so. No sum of money should be considered too great that may be necessary to obtain the book that is really wanted, for when such a book is once written its influence will be far-reaching, and may be an endless boon to thousands of teachers, to say nothing of the students themselves.

Let such a Commission collate and examine the existing technical literature and find and engage experts to write full and accurate works upon all those matters and branches of trade that are not yet adequately represented in literature, and thus establish—what we really ought to possess—a complete library of sound and trustworthy technical and trade information.

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.

THE Royal Institute of Architects of Ireland held its annual meeting recently.

Mr. G. C. Ashlin, R.H.A., the newly-elected president, took the chair, and said that coming after the long and successful presidency of Sir Thomas Drew, during which the interests of the Institute were so much advanced, he thought that his task would not be an easy one, except he could rely on the consideration of the Council. Continuing, he deprecated the practice which had sprung up of late amongst public companies, who had their headquarters in London or elsewhere in employing architects who were not in practice in Ireland to erect buildings in Dublin.

He then referred to the possibility of the revival of the ancient arts of Ireland and their adaptation to our modern circumstances. An eminent French writer said: "The Irish monks exercised a considerable influence on Continental Art down to the days of Charlemagne in the monuments of the Romanesque movement." Other competent authorities had borne similar testimony to the work of their fellow countrymen of that time over the whole of Europe, so that it might be safely affirmed that there existed for a long period a distinctive national school of Irish Art capable of immense development. The national progress of this school was unfortunately arrested in Ireland by extraneous circumstances, but they still possessed many examples all over the country which compared favourably, especially in delicacy of treatment, with contemporary Romanesque art in other countries. Although the buildings that remained in Ireland in this style were comparatively few and small, they contained the germs of a pure and original type of monumental art, and sufficient to guide them over the whole field of its building and decoration. Hitherto the efforts of their artists and architects had been mainly confined to the development of this style in such minor matters as sepulchral monuments, Celtic crosses, and illuminated addresses. Now, however, when there had arisen in Ireland such a pronounced desire amongst the public to foster all the distinctive features of their national life it appeared opportune that an attempt should be made to carry out the principle in their own important monumental buildings. He threw out the suggestion that the next subject for competition offered to the Architectural Association of Ireland might be for the design of a church, taking Cormac's Chapel at Cashel as a type, modified to suit their present ideas, and the facilities in materials and construction they enjoyed.

He then spoke of the difficulties in connection with ecclesiastical work which were experienced in finding artificers in Ireland with the necessary training and equipment for carrying out the ideas of their clients, and to improve the present condition of affairs help had been promised by their public departments, and especially by the technical schools, and he thought that still further assistance might be given if prizes were offered at the Cork Exhibition for specimens of work for which there was now a constant demand.

The secretary (Mr. W. Kaye Parry) read the annual report, which stated the satisfaction that has been felt at the inauguration of the Ulster Society of Architects, a body affiliated to their own, and formed for the purpose of organising the architects of the Northern province on the same lines as their own institute.

In consequence of the refusal of the Ennis Asylum Board, in the proposed competition for the extensive additional buildings, to appoint as assessor an architect who should have power to amend the faulty conditions of the competition, the Council advised the members of the Institute to abstain from taking part in the competition, and they were glad to say that the members loyally supported the action of the Council in this matter. During the year they lost no members through death, while, on the other hand, they had gained a considerable number of new members, the total now standing at 101.

Mr. J. Rawson Carroll proposed the adoption of the report. Mr. William M. Mitchell, R.H.A., seconded. The report was adopted. Mr. Batchelor, in the absence of Mr. Owen, presented the finance account, which showed that there was a balance of £66 5s. in hand. This also was adopted. The following were elected on the Council: Sir Thomas Drew, Messrs. W. M. Mitchell, J. H. Carroll, C. Geoghegan, F. Batchelor, R. C. Orpen, H. Pentland, A. E. Murray, G. Sheridan. This concluded the business of the meeting. The annual dinner followed in the evening. Mr. G. C. Ashlin, president, occupied the chair.

The Sullivan Memorial.—Mr. Goscombe John, A.R.A., has been commissioned to execute the Sir Arthur Sullivan memorial. A statue of some form to be decided will be placed in the south aisle of St. Paul's Cathedral.

THE BRITISH FIRE PREVENTION COMMITTEE.

THE official report of the International Fire Congress held in Berlin last June, which has recently been issued, contains in full the paper read by Mr. Edwin O. Sachs on "The Organization of the British Fire Prevention Committee and its Investigations with Fire-resisting Materials"; and as this is the first complete description which has yet been published of the general principles, working and finance of the Committee's testing station at 66, Porchester Road, Westbourne Park, we think it will be of interest to give some extracts from it.

After pointing out that the main subject work of the Committee was, firstly, fire prevention pure and simple, and, secondly, fire research—its sphere not being intended to include what is generally termed "fire combating" or "fire-extinguishing"—Mr. Sachs said the Committee was formed after the Paris Charity Bazaar fire and the great Cripplegate fire in London, in both of which cases it was obvious to the world that the subject of fire prevention was really in its infancy. The Committee was formed, first as an ordinary private society, and afterwards as an incorporated committee, with a membership of some five hundred professional men, and the necessary funds for the ordinary secretarial work of the Committee were raised by a regular annual subscription among the members and by voluntary contributions.

A Council of influential members was formed, an Executive, and also a number of sub-committees, and the necessary staff of assistants was engaged, comprising a secretary, assistant secretary, engineer and clerk.

The tests which have been organised by the British Fire Prevention Committee have been limited to obtaining reliable data as to the exact fire resistance of various materials and systems of construction, or appliances used in actual building-practice in Great Britain, or, in other words, they have been limited so far to obtaining results bearing on the everyday practice of the building world in this country, rather than to dealing with theoretical work.

The reason that this should have been necessary or that these investigations should have been necessary at all is, that sufficient data does not exist as to our methods of building construction, and that the little information available has, to a very considerable extent, been obtained by individual makers or manufacturers in their own laboratories, and that the results thus obtained have not been received with much confidence. The few official tests that have so far been undertaken in the United States and in Germany have not been systematically organized, but have simply had the object, as a rule, of dealing with certain specific questions or a certain specific piece of material, employed in a particular building, rather than of treating the question of fire prevention as a whole.

The series of tests undertaken by the Committee hence not only fills "a long-felt want," but gives the fire-prevention trades an opportunity of obtaining authentic records as to the liability of their work. The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view, and all reports on them state solely the bare facts and occurrences, with tables, diagrams and illustrations, and on no occount include expressions of opinion, nor should any phrase be read as a comparison or criticism.

With regard to the financial aspect of the testing station at Westbourne Park, the establishment expenses were intended to be met by a special subscription, but as a matter of fact by no means sufficient subscriptions have as yet reached the Committee to meet the initial outlay, which was very heavy. As far as the funds of the Committee permit, investigations with ordinary (*i.e.*, not patented) forms of construction are undertaken from time to time and duly reported on. Official tests with patented materials, makers' systems, &c., &c., are subject to a scale of charges intended to just cover the actual cost. The testing station is also open to members for such private research-work or tests as they may desire to undertake at nominal charges for loan of plant and instruments. The services of the members participating in the management of the station, conducting or attending tests, are, of course, given entirely gratuitously.

The plant actually completed comprises a set of testing huts in which floors, partitions, doors or ceilings can be tested. The huts are laid down in two rows and are built of stock bricks with lime mortar. The fuel used is gas, produced on the spot by a generator supplied by Messrs. Mason, of Longsight, Manchester.

Each chamber for a floor test allows for the floor under investigation to be placed at least 7ft. 6in. above the floor of the hut, and the chambers are roofed in with galvanised iron, or tarpaulin, when necessary. Bricks or pig-iron are used for any loads that may be applied to floors under investigation, and water is applied from an ordinary manual pump, equipped with pressure gauge. Records of temperatures are taken, as far as possible automatically, by electrical pyrometers designed by Professor Roberts-Austen, of the Royal Mint, and are able to record temperatures up to 2,500 deg. Fahr.

In respect to the ordinary building materials or forms of construction which are not subject to any patent or the interest of any special maker, investigations as to their fire-resistance are undertaken from time to time according to means at the disposal of the Executive for such purposes. It rests with the Executive, either on their own initative or at the instigation of others, to arrange for tests of this description, and it is hoped that the various public authorities interested in the subject will, in due course, contribute financially towards the costs of such experiments as they may consider of general public utility.

The Executive hope, in due course, to be able to record the exact resistance of all the more common methods of construction used in the British Isles.

As already indicated, quite irrespective of the tests undertaken by the Committee with work that is not subject to patents, or not the speciality of individual makers, the fireproofing trade also have every opportunity for obtaining official and independent reports on their systems of appliances at a fixed tariff, the charges being based on the actual cost of such tests. Should the Executive find that these testing charges leave any material surplus, such surplus will be utilised for such purposes as the Commercial Section may direct, this section, as it will be remembered, being representative of the fireproofing trade of Great Britain, and organized under the auspices of the Committee, some forty-five firms and others interested in the trade aspect of fire prevention participating in the operations. There is, however, very little likelihood of a surplus in the near future owing to initial expenses not yet having been met, and with the increasing severity and longer duration of tests the cost of each experiment has naturally risen.

The tariff of charges to cover costs may be taken to read as follows for ordinary tests, the figures for purposes of finance being divided into (1) preliminary expenses, (2) establishment charges, (3) testing charges:—

All firms or individuals not members of a firm desiring tests must in future contribute a donation of £5 5s. to the preliminary expenses incurred by the British Fire Prevention Committee in forming the station.

All firms or individuals desiring tests must contribute to the establishment capital of the station from £10 to £50, according to the nature of the test and the group to which it belongs.

All firms desiring tests must pay in form of testing charges from £50 to £150, according to the nature of the test and the group to which it belongs, as defined below.

These contributions and charges are intended to cover all expenses for ground, carcass, walls, ovens or heating apparatus, instruments, firing, loading, water, attendance and supervision, and on no account shall any other expense be incurred; gratuities to the servants of the Committee, for instance, being strictly prohibited. No responsibility for breakage of instruments, &c., is incurred, an item which frequently costs the Committee very large sums.

The firm or individual having work tested must supply and fix his materials, systems or appliances at his own cost, everything pertaining to the actual test being covered by his contributions as per scale.

When second tests are desired by the same firm or individual, the testing charge—no matter in what group—will be according to scale, but there will be no further contribution to the establishment-capital or preliminary expenses. Where three or more tests are undertaken for the same firm or individual a discount of 10 per cent. off the scale-charges will further be allowed. All contributions are payable in advance at such times as the Executive shall determine.

Before any test with any materials, system or appliance is started, or the arrangements for such a test are commenced, all contributions must have been paid in advance, and the ordinary application for a test must have been supplemented by an undertaking on the part of the firm or individual desiring the test to accept all or any reports of the Committee, framed on the lines indicated above, and further to permit the Executive to issue such reports. The undertaking must be on a form obtainable at the offices of the Committee. Any firm or individual, however, desiring to see the report on a test with his work prior to issue will always have an opportunity given him for this purpose.

Under exceptional circumstances, at the discretion of the Executive and under special conditions to be determined on, tests may be undertaken elsewhere than on the Committee's grounds.

Quite irrespective of the independent tests, the testing grounds are, under special conditions, available to members of the section for private experiments, private investigations, &c., and research work of a private character.

As regards the loan of ground or space at the testing station for private full-size or laboratory tests of an experimental nature, a scale of charges will in due course be arranged according to which the members of the section will be able to avail themselves of the accommodation, instruments, &c., at moderate rates. Every encouragement and facility will be afforded to members undertaking research or experimental work. Such tests have, however, to be conducted purely as private tests, and no report on investigations of this description may be issued by the maker, as it is of the utmost importance that the only reports issued in respect to work carried on at the testing station should relate to the official tests conducted under the auspices of the Committee.

Many of the particulars shown in extracts given above have, we believe, not been known outside the membership of the Committee before, more especially those relating to the financial side. As with most new scientific institutions, there must necessarily be great difficulty in the first few years to make ends meet; and we may assume from the remark as to the initial outlay of the start not yet having been met that there must be deficit in that direction, and a fairly substantial one, for there is nothing more expensive than research work. It speaks well for the Executive that they have, as we believe, made ends meet by personally giving very considerable financial assistance; but now that the institution is an established one, it would almost seem time to call upon the public authorities and learned societies to help monetarily in the investigations which deal with unpatented articles, whilst the testors interested in patented work should put their hands in their pockets and clear off the deficit incurred in work from which so many of them have materially benefited.

What the views of the Berlin Congress were as to official financial assistance for the general investigations was, we hold, quite plainly put in the following resolution, passed unanimously (the membership of the Congress comprising about 2,000 architects, engineers, insurance officers and firemen from all parts of the world): "That the serious investigations of the fire-resistance of materials and systems of construction should be supported both by the Government and local authorities, as well as by such of the technical societies to whose membership the result of investigations of this description are of importance in the practice of their respective professions."

Lant Street Board School, Southwark, has been improved by the addition of three large halls for the use of each department for the purposes of prayers, gymnastic exercises, &c.

Law Cases.

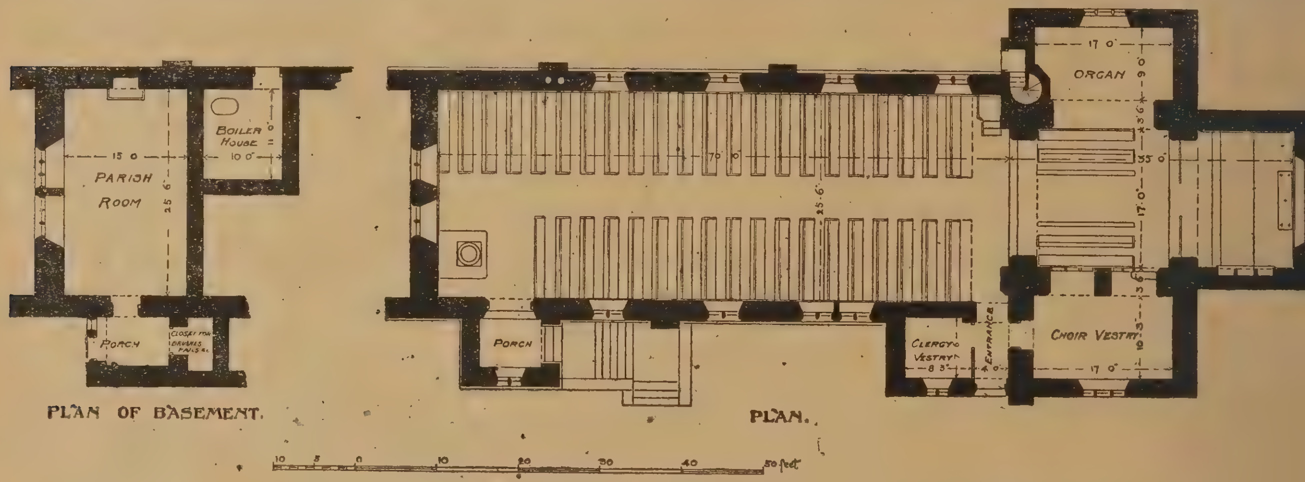
Important Ancient Lights Appeal Case.—The case of *Home and Colonial Stores, Ltd.*, v. *Colls* was heard before the Court of Appeal on December 20th. The plaintiffs claimed an injunction to restrain the defendant from erecting on the site of 44, Worship Street, E.C., any building or erection so as to darken, injure or obstruct any of the ancient lights of the plaintiffs as the same were enjoyed previously to the taking down of 44, Worship Street. In delivering judgment Lord Justice Cozens-Hardy said: The action was tried by Mr. Justice Joyce in December, 1900. This is important, because at that date it had been laid down by Mr. Justice Wright, in *Warren* v. *Brown* (1900, 2 Q.B., 722), that the owner or occupier of a house has no legal right of action so long as he has left to him as much light as is ordinarily required for habitation or business, even though he has been deprived of a substantial amount of light and has thereby suffered substantial damage. Mr. Justice Wright's decision has recently been reversed by this Court, and the true rule of law with reference to the interference with ancient lights has been authoritively laid down thus: "If ancient lights are interfered with substantially, and real damage thereby ensues to tenant or owner, then that tenant or owner is entitled to relief." In this sentence "substantial" does not indicate any particular percentage. Without substantial interference there is no right of action, and, in addition, in order to obtain an injunction the plaintiff must establish substantial injury suffered or threatened. There is no standard or fixed amount of light to which alone a plaintiff is entitled. He must not be fanciful or fastidious. He must recognise the necessity of give-and-take in matters of this nature. It is settled that there is no rule of law that a man may always build up to an angle of 45 degs., but, in judging of the probable effect of a proposed building, the Court may not unreasonably regard the fact that an angle of 45 degs. will be left as *prima facie* evidence that there will be no substantial interference, and may require this presumption to be clearly rebutted by satisfactory evidence. This seems to be the result of the authorities. It remains to apply these general principles to the present case. We propose to accept without demur all the findings of fact by Mr Justice Joyce, where they are clear and only to refer to the evidence where there is no finding, or where, as it seems to us, there are inconsistent findings. His Lordship then proceeded to state the facts as found by Mr. Justice Joyce in his judgment, and, after reading the following passage from that judgment—"Various expert witnesses were examined, and as the result of their evidence I am of opinion that the proposed new building would not affect the selling or letting value of the plaintiffs' premises"—continued: If that means that an ordinary purchaser or lessee would be content to get a building having the usual amount of light enjoyed by similar houses in this part of London we see no reason to doubt it; but it is not a relevant statement. The plaintiffs are neither vendors nor lessees. They are occupiers; and their only desire is to use this room (a large room on the ground floor occupied by about ninety clerks) for the same purposes as heretofore and with the same advantages. And it seems to us impossible to hold that they will not suffer "real damage" if they have to consume and pay for more electric light than hitherto. As we read the judgment, it is a finding in favour of the plaintiffs that real damage would result, though light enough would be left for ordinary purposes of occupancy as a place of business, and there is no finding that the interference is not substantial. Now there was immediately opposite the windows in question what I may call "a gap," in width 36ft. and in height 13ft. 6in. The direct light which passed through this gap penetrated to a considerable depth into the plaintiffs' room. The interference with this light is "substantial" within the meaning in which the word is used. If we consider the judge's notes of the evidence the conclusion at which we have arrived is confirmed. In our opinion, on the balance of evidence, substantial interference and "real damage" will result; and the proper judgment would have been to grant an injunction in the settled form known as the *Yates* v. *Jack* form. But immediately after the action was dismissed with costs the plaintiffs gave notice of their intention to appeal. Notwithstanding this, the defendant has proceeded with and completed the erection of his building. Under these circumstances there is only one course open to us. We must reverse Mr. Justice Joyce's judgment and give the plaintiffs the judgment to which, according to our view, they were entitled. And we must grant a mandatory injunction requiring the defendant to pull down anything erected in breach of the terms of our injunction. This point was really decided by the Court of Appeal in *Parker* v. *First Avenue Hotel Co.* (24 Ch. D., 287). The defendant must pay the costs here and below. Lord Justice Vaughan Williams: The judgment which has just been read is the judgment of the Court; but I wish to add for myself that, so far as the rule of 45 degs. is concerned, I doubt very much whether that rule, as the law is now settled, can be regarded even as a rough measure of the right of the owner or occupier of ancient lights.

A Bristol Appeal Case.—In the King's Bench Division of the High Court of Justice Mr. Hudson recently appealed against a decision of the official referee, Mr. Pollock, in an action brought by Messrs. Llewellins & James, architects and engineers, of Bristol, in whose favour the referee gave judgment on the claim and counter-claim. His clients, Messrs. Humphries, were builders who entered into a contract to erect a building for the Friary Brewery Co. The contract was for £7,000, and was to be subject to the supply of certain foundry goods by the plaintiffs, who occupied the dual position of architects and sub-contractors, and had to make out the certificates as architects, which enabled them as engineers to draw money as the work proceeded. This naturally led to some friction, as the defendants complained that the certificates were too largely in favour of the plaintiffs work. The plaintiffs' claim was for a balance of £1,971, and the defendants disputed the amount of the claim, and also counter-claimed for damages for the non-completion of the sub-contract and for certain allowances. Mr. Sturges, on behalf of the plaintiffs, submitted that the decision of the referee was fully justified and ought not to be disturbed. The Lord Chief Justice said their lordships were not prepared to say that the decision of the referee was contrary to the weight of evidence, and therefore the appeal must be dismissed with costs.

A CARDIFF FIRE STATION.

A NEW FIRE BRIGADE STATION at Cardiff is to be erected in Westgate Street. The plans have been prepared by Mr. Harpur, the borough engineer. The buildings are estimated to cost £15,250. They will have a frontage of 140ft. in Westgate Street and 90ft. in Quay Street, and altogether will cover an area of 2,900 sq. yds. The ground floor will consist of a large engine-room providing accommodation for six engines, and the entrance to which will be from Westgate Street. The stables, consisting of six stalls and a loose box, are to be immediately at the rear of the engine-room, so that the horses can be brought directly to their positions in front of the engines. The call-room will be at the corner of Quay Street, and arrangements made to get it fitted up with the most approved electrical and telephonic apparatus. The chief engineer's quarters will face Westgate Street, and in the same block provision has been made for repairing, and workshops. The plans provide for a commodious block of firemen's dwellings in flats at the rear of the engine-house, providing accommodation for six married firemen and their families and for a number of single men. The first floor will include a large recreation-room and a reading-room, where the men on duty will always be found when wanted. As time means much in the case of fire, sliding-poles will be provided from the bedrooms and other rooms to the engine-room, down which the men may slide at a moment's notice and take their seats on the fire-engine. The flat roof over the stables is to be utilised as a yard for various purposes. The general sanitary arrangements have been well thought out, and are considered to be satisfactory. The doors of the fire-station are to be of the quick-opening pattern, which will open the moment the driver takes his place on the seat of the fire-engine and pulls a cord.

A New Wesleyan Sunday School at Strafford is being erected of yellow stock bricks with Bathstone dressings, and will be about 30ft. high. It will consist of a large class-room 50ft. by 40ft. and an infants' class-room 17ft. by 20ft., with church parlour and other rooms on the first floor. The cost is estimated at about £3,000. The architects are Messrs. Gordon & Gunton, and the builders Messrs. E. A. Roome & Co.



CHRIST CHURCH, HOLLOWAY, DERBYSHIRE. PERCY H. CURREY, ARCHITECT.

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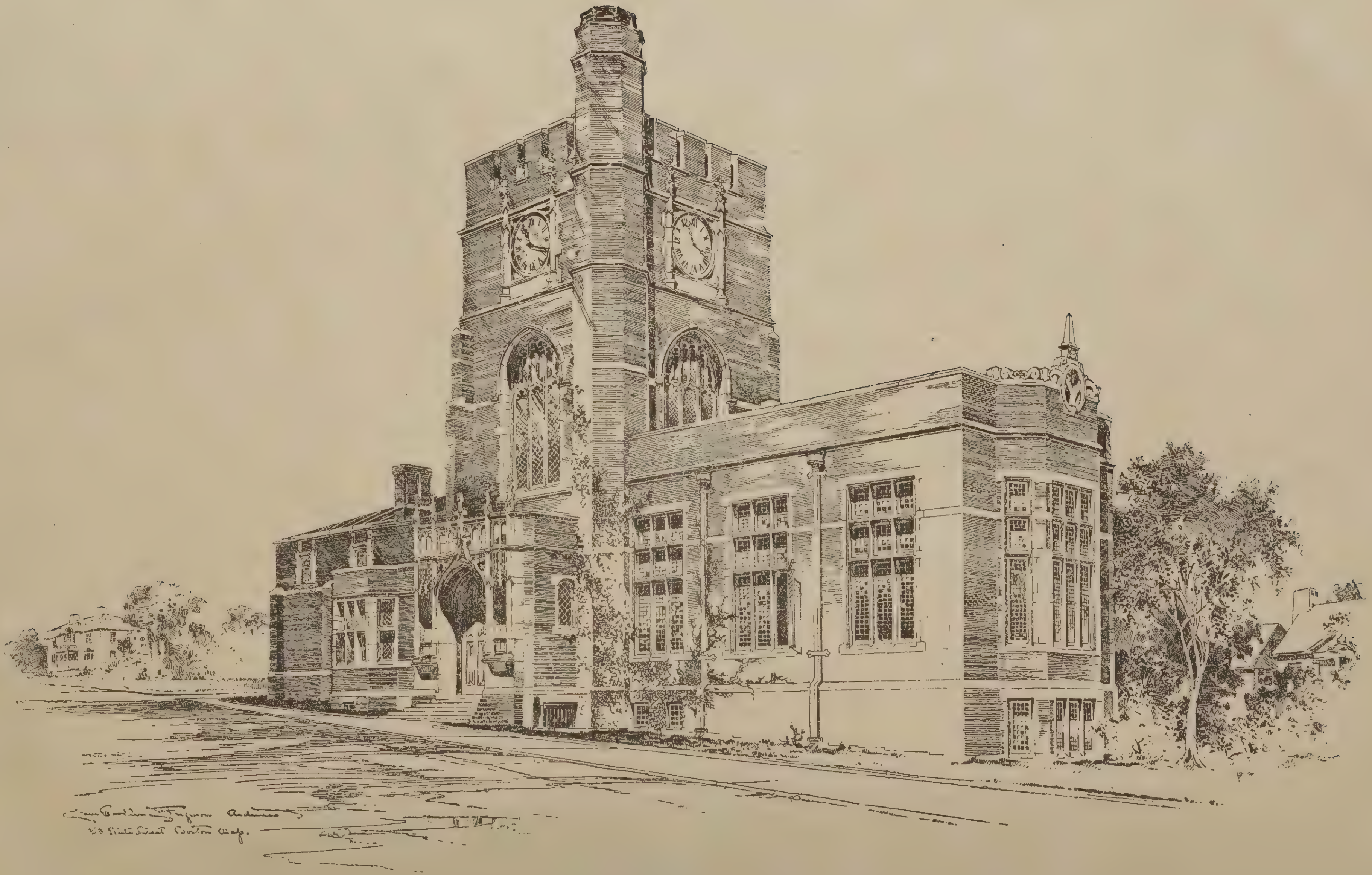
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, January 1st, 1902.


Cram Goodhue & Ferguson Architects
53 State Street Boston Mass.

PUBLIC LIBRARY, NASHUA, NEW HAMPSHIRE, U.S.A. Cram, Goodhué, and Ferguson, Architects.

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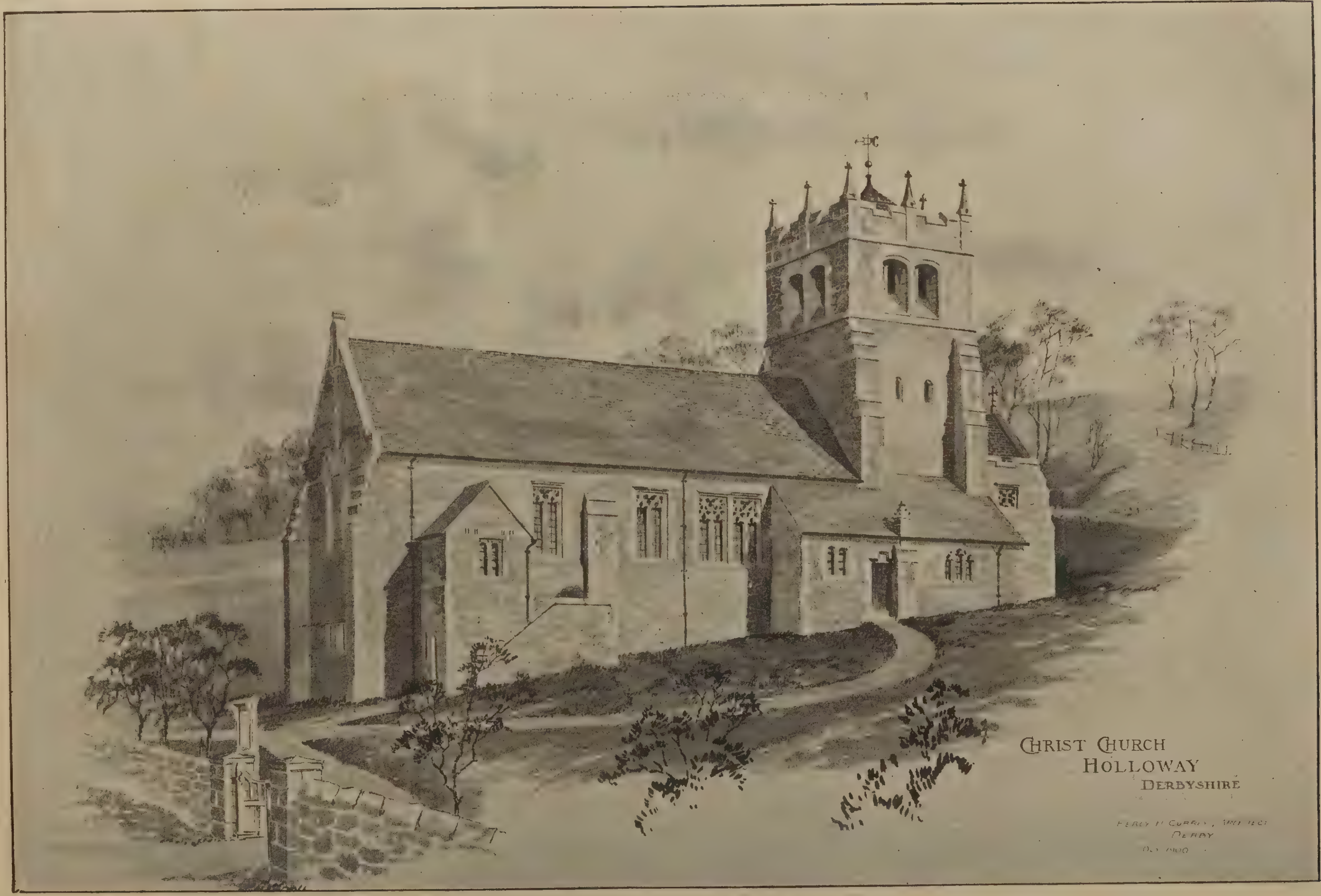

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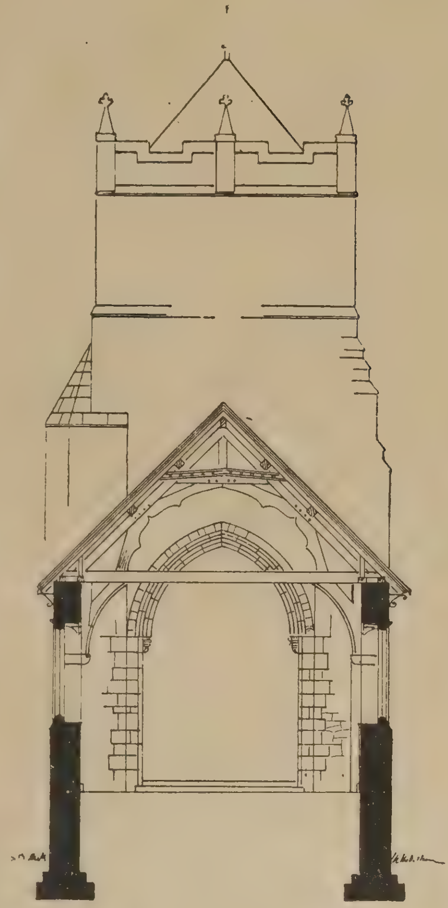
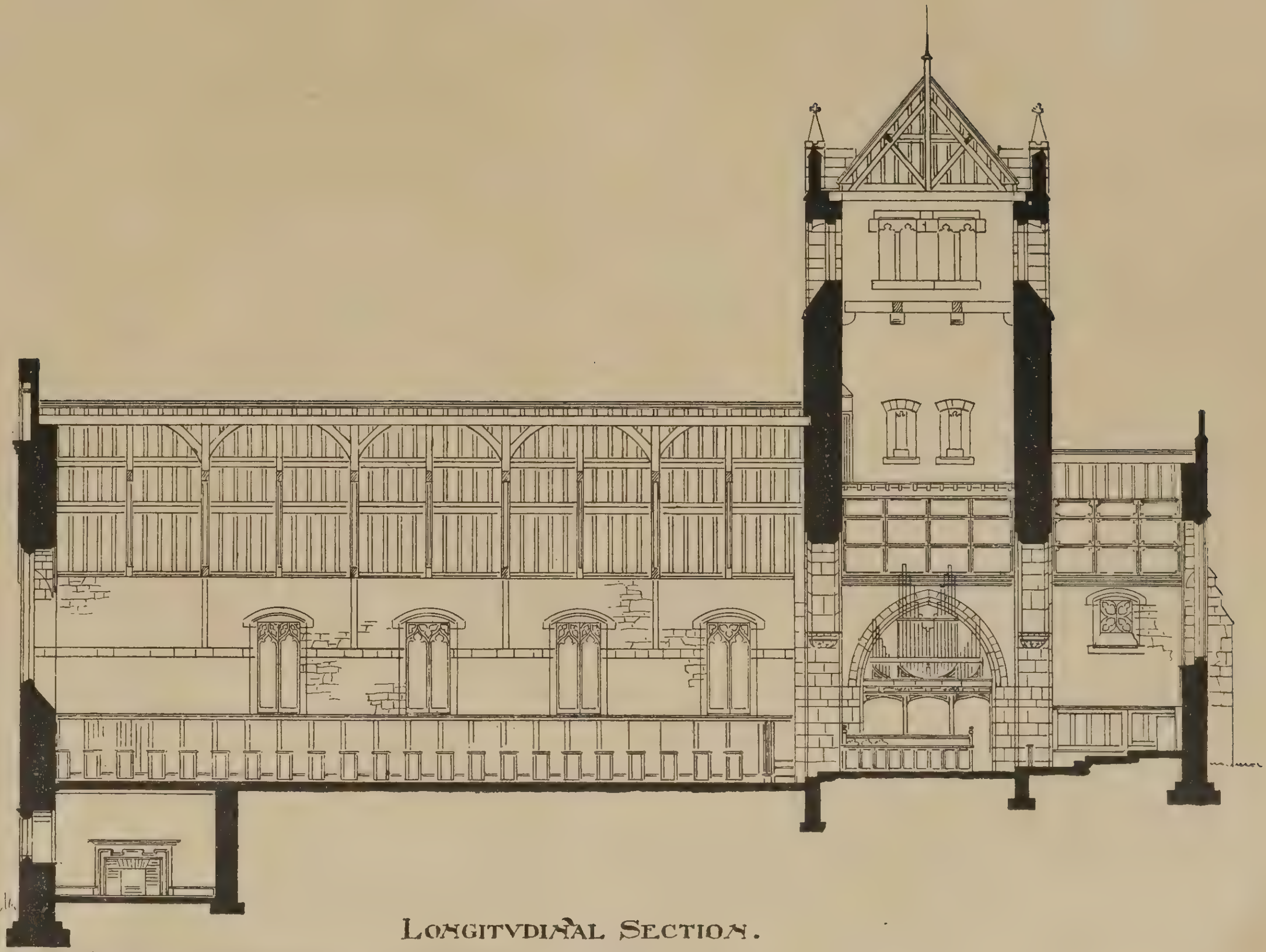


CROSS SECTION.



LONGITVDINAL SECTION.

CHRIST CHURCH, HOLLOWAY, DERBYSHIRE. PERCY H. CURREY, Architect.

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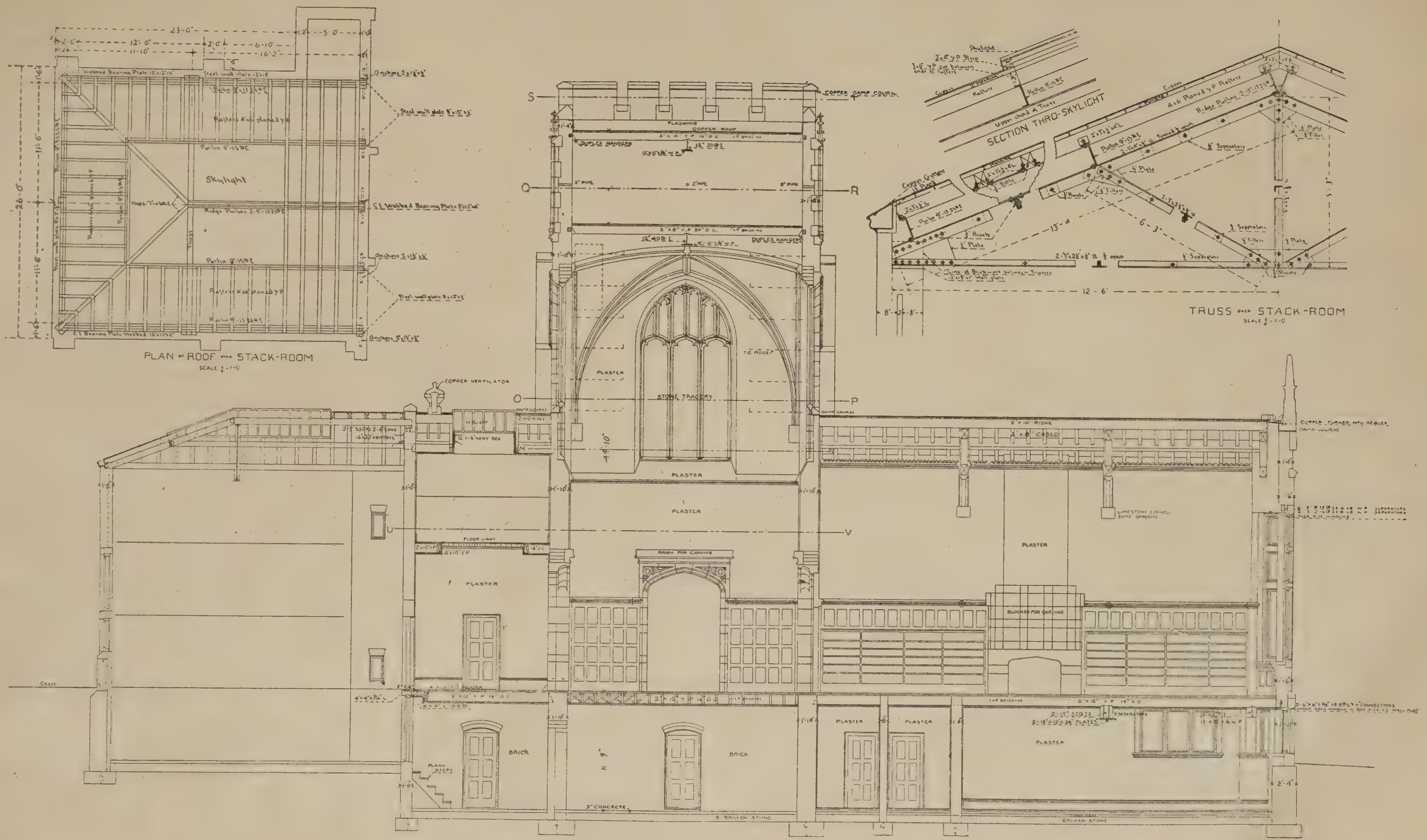
PLAN of ROOF over STACK-ROOM
SCALE ¼ - 1-0

TRUSS over STACK-ROOM
SCALE ¼ = 1-0

DETAILS OF PUBLIC LIBRARY, NASHUA, NEW HAMPSHIRE, U.S.A.

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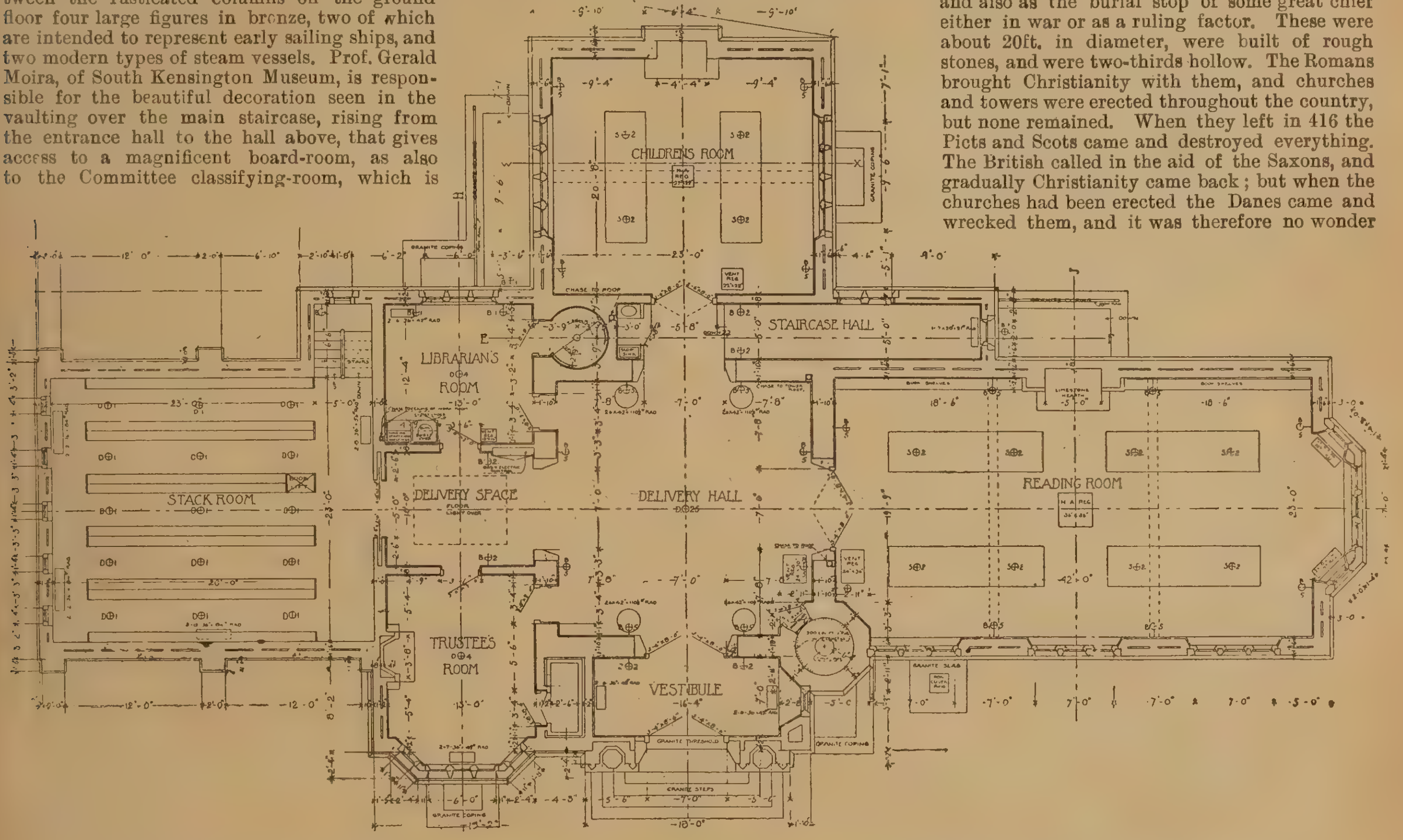
LLOYD'S.

THE business of Lloyd's Register has been transferred to the new building, which has just been erected in the City at the junction of Fenchurch Street and Lloyd's Avenue, from designs by Mr. T. E. Collcutt. In richness of ornamentation and decoration, there is, indeed, only one block of buildings devoted to commercial purposes in the City which can compare with the new structure, and that is the Hall of the Institute of Chartered Accountants, near Moorgate Street. Adopting the style of the Italian Renaissance, Mr. Collcutt called to his aid Mr. G. Frampton, A.R.A., for the execution of a sculptured frieze, which is a conspicuous feature in the imposing main façade of the premises that Lloyd's Register of British and Foreign Shipping will henceforth occupy. Mr. Frampton was also employed to introduce between the rusticated columns on the ground floor four large figures in bronze, two of which are intended to represent early sailing ships, and two modern types of steam vessels. Prof. Gerald Moira, of South Kensington Museum, is responsible for the beautiful decoration seen in the vaulting over the main staircase, rising from the entrance hall to the hall above, that gives access to a magnificent board-room, as also to the Committee classifying-room, which is panelled in oak grown and carved in Essex. The two halls mentioned are, with the staircase, built entirely of Devonshire marble of various tints, and the stairs are of Carrara marble. A frieze of striking design, by Mr. F. Lynn Jenkins, is carried round the walls of the upper hall. The interior walls of the board-room are composed of Numidian marble; black Belgian marble and Irish green marble being also used, and there is a dado of African mahogany with richly inlaid panels. Professor Moira is decorating this chamber in subjects emblematical of the sea, and Mr. Henry Pegram has carved in Carrara marble a centre panel for the large fireplace, resting on columns of the red marble still quarried in Egypt. There are several other valuable mantelpieces in the building, and one in Hoptonwood stone contains an artistic frieze by Mr. Bertie Pegram. The ceiling panels of the luncheon-room have been painted by Mr. E. J. Lambert; the ceiling itself, picked out in gold, being decorated with shells, anchors and other emblems of the deep. The fittings in all the principal rooms have been specially designed by the architect.



GROUND-FLOOR PLAN OF PUBLIC LIBRARY, NASHUA, NEW HAMPSHIRE, U.S.A. CRAM, GOODHUE AND FERGUSON, ARCHITECTS.

The Parish Church of St. James, Hereford, was totally destroyed by fire last week, the cause of the disaster being attributed to the heating apparatus setting fire to some adjoining woodwork. The church was built thirty years ago.

MODERN SCULPTURE.

AT a recent meeting of the Cardiff Naturalists' Society Mr. W. Goscombe John, A.R.A., gave a lecture on "Modern Sculpture." The lecture was divided into two parts—one a short but able and erudite summary of the history of sculpture, and the other a series of lantern illustrations showing many of the chief works, upon which the lecturer passed comments and gave explanations. Mr. Goscombe John, in reference to sculpture of the past, said he was afraid that some of the older samples of sculpture were arranged in museums upon chronological lines, like fossils, and the result was that many of their most beautiful characteristics were lost sight of. When the age of Greek art passed into decadence its effects were felt in Rome, where not only were samples of Greek sculpture obtained and preserved, but, what was better, they sought to learn its spirit. He attributed the commencement of the age of modern sculpture to Lorenzo Bernini, who, although his work was often flimsy and fantastic, did much work that had a great influence upon his successors. During the seventeenth century Rome was still the centre of the world of art. But leaders of schools of art arose in both France and Spain, each of which had its peculiar characteristics. Speaking generally, he said that sculpture must be "living," and represent the characteristics of the times during which it was done. The first great British sculptor was John Bacon, who was the leader of sculpture in England during the close of the eighteenth century. He was followed by Glaxman, who was one of the greatest of British sculptors. It was in France, however, that they found the most complete expression of sculpture. The characteristics of Greek sculpture was objective, whilst that of Rome was subjective. Both were the result of the religious tendencies of the different ages. The characteristic of modern sculpture, especially as represented in the French school, was life, movement, and human sentiment as apart from religious expression. At no period of the world's history had sculpture expressed the feelings of man towards man more than it had during the last seventy-five years. England would never approach foreign nations in the art of sculpture until the Government and the municipalities became interested patrons of the art. If an ordinary English town were compared with an average Continental town, it would be found that the foreigners put the English to shame. No country could excel in art unless it patronised its artists.

THE TOWERS OF CORNWALL.

UNDER the auspices of the Liskeard Literary Institution, Mr. E. Sedding, of Plymouth, recently delivered a lecture on the towers and churches of Cornwall. He said that in many parts these seemed more to have grown by the work of Nature than by the act of man. The first towers really consisted of a heap of stones, which were piled up, not for warlike purposes only but to commemorate the death and also as the burial stop of some great chief either in war or as a ruling factor. These were about 20ft. in diameter, were built of rough stones, and were two-thirds hollow. The Romans brought Christianity with them, and churches and towers were erected throughout the country, but none remained. When they left in 416 the Picts and Scots came and destroyed everything. The British called in the aid of the Saxons, and gradually Christianity came back; but when the churches had been erected the Danes came and wrecked them, and it was therefore no wonder that no relics were left. The advent of the Normans was propitious. They were born masons, and to-day there remained some of their splendid work at St. Germans, Bodmin and Tintagel. Festormel (Lostwithiel) and Launceston were very fine Norman keeps. Mr. Sedding showed some beautiful illustrations of churches and towers in Cornwall, the first being that of St. Germans. The next was that of the fascinating little church and tower of Tintagel; the latter consisting of three stages, as was also that at Forrabury (Boscastle); it was undoubtedly Norman. The towers erected with buttresses were before the fifteenth century. St. Teath (near Delabole) possessed a window, which was unusual. An illustration of Lostwithiel tower was shown; this was one of the finest in the county, and had been described as the "glory of Cornwall." Warbstow tower was of fourteenth-century date, as were also those of Michaelstow and Jacobstow. Morwenstow tower showed the finest Norman work in the county and the little church was built in a hollow with the moor all around it. The tower at Egloskerry (near Launceston) had been spoilt by someone placing a window and doorway of the whitest possible granite in it. A most interesting tower was that at St. Dominic, which looked as if the architect had reached a certain height and then decided to expand the top. The smallest church and tower in Cornwall was at Tremaine.

THE MERSEY DOCK BOARD OFFICES.

THE Mersey Dock Board have now passed the building plans for their new offices on the George's Dock site, Liverpool. This design by Messrs. Briggs & Wolstenholme, FF.R.I.B.A., 3, Lord Street, and Messrs. F. B. Hobbs, A.R.I.B.A., and A. Thornely, A.R.I.B.A., 14, Castle Street, Liverpool, and those of the architects who obtained the second and third prizes in the recent competition, Messrs. Woolfall & Eccles (second) and Mr. James A Cook (third), with various drawings showing the details of the respective schemes, were exhibited some time ago and excited much comment as well as a strong diversity of opinion as to their merits. It was known that the Dock Board had been guided in their decision upon the ten designs sent in by the advice of Mr. Alfred Waterhouse, R.A., and it was the superiority of the internal arrangements which led to a selection of the first premiated design, the position of the rates and dues and post entry departments being chiefly considered. These departments in the successful scheme are on the ground floor, with several entrances from James Street. All three premiated designs were in the Renaissance style—two of the English and one of the French Renaissance—and the architects of the first prize describe theirs as being that of the "Late English Renaissance treated in a simple and dignified manner. The two towers flanking the main entrance form prominent features in the design." On the west side the building is set back from the original line, and the block made rectangular in form. The land thus available, in addition to that specified to be left for ornamental grounds, provides a space capable of being treated more effectively than would otherwise be the case, and also enables an easy access for carts under the main building to the areas within for the supply of heavy goods generally to be provided. The main entrance is placed on the south-west front. The internal plan shows that the various departments are self-contained, with direct access and excellent lighting. As has been already said, the rates and dues departments are practically on the street-level, as are also the graving dock offices. The boardroom is on the first floor, as are also the offices of the general manager and secretary. The five storeys provide ample accommodation for all probable office requirements, but should necessity arise a sixth floor may easily be added without materially altering the design, while the architects state that the arrangement they have adopted has also this advantage, that the building above the first floor facing Brunswick Street need not be built until the accommodation is actually required. They propose that the whole of the frontage of the building should be faced with specially selected stone from the Grinshill or Dailey Dale quarries, while the walls of the areas would be faced with buff bricks and the roof covered with green Westmorland slates. In calculating the cost the foundations are put at over £13,000 and the superstructure at £257,246.

A New Volunteer Headquarters and Drill Hall at Eastbourne is proposed to be erected for the 1st Sussex R.E.V. The frontage of the new building to the road will be 80ft., but the full frontage of the land to the thoroughfare forming an extension of Ashford Road is 150ft. The front elevation will be of red bricks with stone dressings, with green-slated roof and tower; and the front part of the ground floor of the structure will include hall and vestibule, lavatory, officers' room, orderly-room, canteen, sergeants' mess. At the back the drill hall (with access from the front hall and side) will be 100ft. by 50ft., and there will also be a model shed, field works store, kitchen, clothing store and armoury. The side premises will consist of coal-shed, stable, magazine and lavatories; and the large open parade and drill yard will be 70ft. by 60ft. The first floor over the front portion of the ground floor will be approached by a good wide stairway. The room for the permanent staff will be 16ft. by 11ft., and the flat for caretaker will consist of two bedrooms, living-room and offices. The plans have been prepared by Major A. A. Oakden.

Engineering Notes.

The Gloucester-Diary and Directors' Calendar for 1902, published for the Gloucester Railway Carriage and Wagon Co., Ltd., gives, amongst other information, a number of interesting "Notes for Visitors to Gloucester."

The Additions to the Isolation Hospital, Aldershot, are being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues and special vertical inlet tubes, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Mr. Arthur Crompton Brown, A.M.I.C.E., chief agent and engineer at Seaham Harbour to Messrs. S. Pearson & Co., Ltd., contractors, of Westminster, who are constructing Lord Londonderry's new deep-water dock, was killed at the works last week. Mr. Brown was superintending the erection of a dam across the entrance to the south dock when a steam crane knocked him off the quay. He fell on to the dam, a distance of 20ft., and fractured his spine, death resulting in less than half-an-hour. Mr. Brown was forty-six years of age. He had carried out engineering works at Dover, in Derbyshire and at Portland.

Surveying and Sanitary Notes.

Mr. Charles A. Dawson, Local Government Board Inspector for the Northern District, including Northumberland, Durham and the North Riding of Yorkshire, died recently at the age of sixty-three years.

The Piccadilly Widening.—The question of the widening of Piccadilly came before the Westminster City Council recently. The Improvements Committee reported that there was not the slightest chance of the Crown assenting to the making of the new road through the Green Park parallel to Piccadilly. They, therefore, recommended the Council to approve the amended scheme, suggested by the First Commissioner of Works, for the widening of the thoroughfare from Hyde Park Corner to Down Street, such agreement to include the maintenance of the widened part. To this recommendation Sir John Wolfe Barry showed considerable opposition. He understood the new scheme would not be of the least use to the public, and would cost Westminster £870 a year to maintain. He moved an amendment to the effect that the Council would undertake the maintenance of the widened part of Piccadilly, but did not approve of it. This was carried.

Street-Paving and Property.—At a recent meeting the Town Improvement Committee of the Gateshead Town Council received a deputation from the Master Builders' and Property Owners' Association. Mr. N. G. P. Herdman introduced the deputation, and said the resolutions their Association had passed asked that owners of property be granted the right to pay for street-paving by fixed instalments if they desired. Workmen might be able to find a sufficient margin to purchase a house, but not the extra cost of £30 for paving, whereas they might take the risk if it were made a yearly payment of £4. This should be a fixed right and not a boon granted. If a builder could assure a timid investor that his paving, when done, might be paid for in small half-yearly instalments, his chance of selling would be much increased. Referring to the kind of pavement that should be used, he said whinstone-chip pavement had now but little to recommend it. Quietness, cleanliness and general comfort could be obtained by choosing other paving materials. They also suggested to the Council to urge upon those responsible for setting-out land to give them wide main thoroughfares capable of taking trams at one part, carriages and carts at another, and an avenue for foot-passengers. Asphalted avenues in the branch streets would be better than whinstone. Mr. J. A. Morris explained the proposed street plan, after which the chairman (Mr. R. Affleck) intimated that the subjects would receive the careful consideration of the Council. The Council, he added, were already arranging to take Parliamentary powers to more justly and fairly apportion the cost of street-paving.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Whitening Rough-Cast.

TWICKENHAM.—BROWN MADDER writes: "I wish to whiten some existing rough-cast, which is at present a brown colour, the washed gravel having been dashed on without being mixed with putty. I propose giving the work two coats of limewhite. Will this be suitable?"

See a reply to an enquiry on p. 440 of our issue of January 9th last.

Dealing with Waste Water.

LONDON, W.C.—REDHILL writes: "Can you suggest any better method of dealing with the waste water from the sinks only of four country cottages than draining it into a cesspool, with overflow, and pumping it up for use on gardens? There is no sewer in the neighbourhood to drain into. Rainwater is dealt with separately."

We would suggest that the waste water might be run into irrigation trenches direct on to the land in the gardens or fields, conducting it to them by glazed stoneware channels.

Books on Nonconformist Chapels and Schools.

LYTHAM.—W. L. writes: "What are the best books on Nonconformist churches and schools?"

We know of no book dealing especially with Nonconformist churches and schools. The usual and best method is to study the requirements of each congregation and to design a suitable modern building, and not to provide an archæological rehash. During the last fifty years the architectural periodicals have published a vast number of designs of churches for all denominations, which will, perhaps, aid you.

Competitions.

READING.—ENQUIRER writes: "A certain number of, say six, architects are invited by a Building Committee to send in competitive designs. Five decline, and the remaining one only accepts. Is the Committee morally bound to allow that one to complete his design and to adjudicate upon it, or are they at liberty to consider the whole matter *de novo*?"

We do not agree with competitions as a rule, and object to one like this in particular, as it causes needless waste of time, energy and money. We think the best plan would be to entrust the design to the architect who accepted. However, we do not think the Committee is morally bound to adjudicate upon his single design, but they should certainly ask him to compete in another competition, paying him for any work he may have done that will be wasted by any alteration of the conditions in the new competition. If the Committee decides not to have another competition, they should place the work in his hands.

An Old Architectural Book.

LONDON, W.—G. T. P. writes: "Where can I purchase 'Regle des Cinq Ordres d'Architecture de Jaques Barrosio de Vignole' (A.D. 1715), published in Amsterdam?"

A copy of this old book can only be obtained second-hand. You should make enquiries of booksellers and others. Mr. Batsford has no copy, but there is doubtless one in the British Museum which you could inspect.

"Manholes and Sewers."—In the reply to this enquiry on p. 312 of our issue of December 18th the size of the manhole was given as 2ft., whereas it should have been 3ft.

Bricklaying and Trade-Unionism.—"The Times" continues to publish numerous letters dealing with various aspects of this question; they form interesting reading, but do not break any fresh ground of importance.

Bricks and Mortar.

APHORISM FOR THE WEEK.

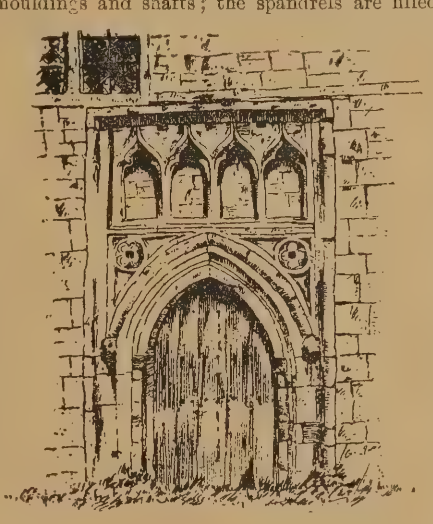
To look back to antiquity is one thing; to go back to it is another.—COTTON.

Our Plates. CHRIST CHURCH, HOLLOWAY, is now being erected by Messrs. Wildgoose, Matlock. The architect is Mr Kerry, of Derby and Nottingham. It is in Gothic style, cruciform in design, and will be built to accommodate 300 persons. It will be chiefly built of local Derbyshire gritstone. The foundation-stone is of Stancliffe stone. There will be a fine west window, and the square tower will be added at some future time.

Memorial to a Chester Architect. A BEAUTIFUL stained-glass window which has been erected to the memory of the late Mr. T. M. Lockwood, F.R.I.B.A., of Chester, in the historic church of St. John the Baptist, Chester, by the master-builders of Chester and district and kindred branches, was recently unveiled and dedicated. The window is the work of Messrs. Sprigley & Hunt, of Lancaster and London, and is rich in design and colour. Hiram of Tyre, the architect of the Temple and great metal-worker, is depicted standing on an architectural base under a canopied baldachin. He holds in his right hand a pair of compasses. The pillars on either side are those which he cast for the porch of the Temple, described in the 7th chapter of the First Book of Kings and called Jachin and Boaz. They are sketched from the pillar in Raphael's cartoon of St. Peter and St. John healing the cripple. The pillar is drawn from one in the Vatican Museum which was dug up on the site of Solomon's Temple and is undoubtedly of Hiram's design. The chapiters described in the Scriptures were too elaborate for the purpose of the memorial window, so the pillars are surmounted by angels, one holding the seven-branched candlestick and the other a model of Hiram's great laver supported by twelve oxen. The following inscription appears: "To the glory of God and in memory of Thomas Meakin Lockwood, architect, of this city, who died July 15th, 1900, the window is dedicated by the Chester Association of Master-Builders and others who were associated with him in his professional work." In the design are worked a number of Freemasonry emblems, the presence of which are due to the late Mr. Lockwood's prominent association with Masonry. The unveiling ceremony was performed by Mr. W. Vernon (Chairman of the Chester and District Master-Builders' Association), and the dedication prayers were said by Rev. Canon Cooper Scott (vicar).

A Famous Indian Archæologist. THE late Mr. Edmund William Smith, M.R.A.S., archæological surveyor of the North-Western Provinces and Oudh, whose death we referred to last week, joined the department as assistant architectural surveyor in 1886, and in that capacity made a detailed examination of the Mogul architecture of Fatehpur-Sikri, the ruined capital of Akhbar, the results of which were embodied in four handsome folio volumes, illustrated with photographic plates, and issued under the orders of Government. Another of his published works deals with the China-ke Rauza, a building to which exceptional interest and beauty are given by the exterior coating of rich tiles worked into innumerable designs. Mr. Smith succeeded Dr. Furher as the provincial head of his department and curator of Lucknow Museum in 1898. Long before Lord Curzon called attention to the responsibilities of the Indian Government in respect to the ancient buildings of the country, Sir Antony MacDonnell had adopted a liberal policy towards the archæological department in the provinces he ruled; and under his directions Mr. Smith accomplished a great deal during his all too brief tenure of the appointment in the restoration and conservation of ancient buildings. The famous Taj Mahal at Agra received special attention, and in executing the delicate restorations required Mr. Smith called into activity a vein of latent indigenous talent with excellent results, many of the artificers engaged claiming to be descended from those who were employed by Akhbar and Shahjehan. The squalid surroundings of the approach to the Taj, noticed by many travellers, have been removed by the conversion of the barren ravines and huts lying between that "dream in marble" and the Fort into a public park. Restoration on an extensive scale has been conducted by Mr. Smith at Fatehpur-Sikri, and the more important ancient buildings of Allahabad, Lucknow, Fyzabad and Bahraich were also repaired. A portfolio of architectural drawings, intended to influence for good Indian designs and workmanship by a return to ancient models, was in course of preparation by Mr. Smith.

Otham Church. OTHAM CHURCH, Kent, is dedicated to St. Nicholas. It consists of a nave with north aisle, a chancel with north chapel, and a tower on the south side of plain Early English work with small, narrow and obtuse apertures and a stair turret. Most of the windows are square-headed with Decorated tracery, but some are modern. The church was restored in 1873. In the chancel the windows are Perpendicular. The aisle is very narrow, and has one large pointed arch opening to the nave, and another to the chancel on octagonal pillars. The north doorway is a good specimen of Perpendicular, its arch having good mouldings and shafts; the spandrels are filled with quatrefoils; with a course of elegant panelling above, the whole included in a square compartment.



NORTH PORCH, OTHAM CHURCH, KENT.

Comments on the Kaiser's Speech. THAT the Kaiser's views on modern German sculpture (as reported on page 332 of our last issue) are not wholly acceptable to his subjects, the following extracts testify. The "Berliner Neueste Nachrichten" gives prominence to an article which traverses the view that German sculpture can be benefited by keeping itself clear of the influence of modern tendencies and movements. "German sculpture, on the contrary, requires to aim at progress in conception and in technique instead of clinging to traditions. Greatly as the conception of the Avenue of Victory is to be commended as one which, beyond being a tribute to the Sovereigns of the House of Hohenzollern, aims at preparing a halcyon period for German sculpture, the results which have been achieved by the sculptors who were selected have not, with a few well-known exceptions, been of epoch-making importance in the opinion of many artists and of a large section of the artistic public." The "Cologne Gazette" finds that "if all the Berlin sculptors together were weighed in one of the scales of art and Arnold Böcklin in the other there is scarcely any doubt that this single 'modern' artist would turn the balance." The "Frankfurter Zeitung" says: "Begas and his colleagues may well be pleased. The Avenue of Victory will make an overwhelming impression upon all the world. The Emperor has said it. All the puffing articles of all the newspapers in the world could not secure for these sculptors that 'vast respect' at home and abroad which the Emperor claims for them. The newspapers could not do this, simply because, as the Emperor thinks, they are wholly absorbed in puffing others—to wit, the modern artists."

Three Bills. THREE separate Bills bearing on important artistic problems of Rome and Italy in general are now before the Italian Parliament. One provides for the expropriation of the park known as Villa Borghese for £120,000, on condition that after expropriation it be given by the State to the municipality of Rome and that the municipality connect it with the public promenade on the Pincian Hill and call it Villa Humbert I. The second Bill authorises the purchase of the Borghese Gallery, situated inside the park, and founded by Cardinal Scipione Borghese. The Government proposes to pay £140,000 for the gallery. The same Bill proposes to create a large national art gallery within the park, and to transport thither, not only the present Borghese collection, but also the other art collections of Rome. The third Bill deals with the preservation of national monuments and with the trade in artistic objects. This Bill has been much modified during the discussion in the Senate, and has been weighted with a clause to the effect that it cannot be promulgated until a catalogue has been made of all pictures and other works of art which, being considered national monuments, may not be exported. Pending the re-presentation of the Bill next spring, the practical question of the trade in artistic objects remains untouched. Officials of the Fine Arts Department of the Italian Government are appointed to examine pictures and other objects sent in by dealers with a request for permission to export, but they judge them, not according to their real artistic merit, but according to the price which the dealer likes to put on them. Suppose a private individual buys for £1,000 a picture by an old Italian master from some Italian nobleman who may wish to dispose of it. If the purchaser is honest and tells the Fine Arts Department, when asking for permission to export, that he believes the picture to be worth £1,000 he is certain not to get permission. The Italian Government's "experts" will argue that a painting worth £1,000 must be a great work of art, and ought not, therefore, to be allowed to leave the country. If, on the other hand, the purchaser is wise enough to declare the value of the picture to be £10 he will not only get his permission, but will also pay proportionately less export duty. These things have happened over and over again. Public money is also wasted in useless litigation. It would be interesting to know how much the prosecution of Prince Chigi for selling his Botticcelli cost the Italian Government. Prince Chigi escaped with a fine of £3 or £4, and the Fine Arts Department looked ridiculous.

Mr. Onslow Ford. MR. ONSLOW FORD, the distinguished sculptor and Royal Academician, died suddenly last week at his residence in St. John's Wood. He was born in London in 1852. As a boy he showed both aptitude and desire for an artistic career, and in 1870 he went to Antwerp as a student of painting. From his Flemish masters he passed on to a German professor, Wagmüller, of Munich, who saw that his pupil's talent lay in the direction rather of the graver than of the brush. From that time Ford devoted himself to sculpture. He left the Munich schools in 1872, and in a few years he had become a regular exhibitor at the Royal Academy, had won a competition with the statue of Sir Rowland Hill which stands in the Royal Exchange, and found himself with no lack of well-paid commissions to execute. The earliest work of the sculptor's that attracted general attention was the seated statue of Sir Henry Irving as Hamlet. This was done in 1883, and is now in the Guildhall Art Gallery. The London public know Mr. Ford's work chiefly from the Strathnairn monument which stands in Knightsbridge just at the top of Sloane Street. At Oxford there is in University College the Shelley Memorial. Mr. Ford also did the Jowett Memorial, a fine piece of decoration in which mosaics and marble and conspicuous lettering help to make an effect. The Marlowe Memorial at Canterbury and the statue of Gordon upon a camel, which stands at Chatham, were two more efforts in this line which helped to make Onslow Ford's name. His aim was to blend the decorative and the realistic. Mr. Ford was elected A.R.A. in 1888 and R.A. in 1895.

Correspondence.

Army Works Reform.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to the above important subject, permit me to furnish the following examples of barrack scandals.

In an article on the "Reorganisation of the Royal Engineers," by a Royal Engineer officer, in the "United Service Magazine" for June 1900, this confession occurs: "It is notorious in the Army that the district work done by the Royal Engineers, whether in India or England, is of a very inferior nature. Indeed, the gibe is frequent: 'Those engineers again.' It has been asserted that barracks have been designed without foundations; houses without stairs; flues without draught; w.c.'s so built that no mortal can use them in safety; earth-closets so constructed as to shoot earth into one's lap; drains made to flow uphill; latrines built without drainage; forts erected that cannot be occupied by reason of damp; batteries placed where defence is impossible; magazines provided that are always full of water; doors made that will not close; windows inserted that cannot open; roofs put on that always leak; floors laid down that cannot be washed; billiard-rooms constructed not wide enough to admit of playing; ventilators put in that serve as smoke-traps; hollow walls authorised that act like sponges. These are some of the charges levelled at the Royal Engineers, and not without good grounds."

The following appeared in the number of "Modern Society" dated July 21st, 1894: "The electric light alterations at the Army Clothing Factory at Pimlico were estimated to cost £1,600. This sum has been found insufficient, and the bill runs up to £2,100. To provide accommodation for horses at Lusk, Dublin, £1,300 was asked for; this amount has now swollen to £2,100. On a like principle, £7,000 was the estimate for provision of a hospital at Edinburgh Castle. This has jumped up to £12,000. At the Isle of Wight the same old tune of insufficient cash is being played. To revise the battery at the Needles £,8000 was thought to be the height of extravagance. This sum has been topped, and £10,000 is going to melt away over this job. To reconstruct the drainage at Gravesend Barracks the estimate has been increased from £1,200 to £1,600. Who is responsible for these?"

The ensuing are only a few out of the many barrack failures which are occurring constantly, though the great majority never come to light:—

Aden.—The sappers built a swimming-bath at Aden which let the water in when it was not required and could not keep it in when it was wanted. The men are not allowed to bathe in the sea because it is full of sharks, and cannot use the bath because there is no water in it. A tank was also constructed, which similarly would not hold water. Aden is one of the hottest places known, and rain only falls about once every two years.

Aldershot.—The new barracks are ill-lit, being supplied with oil lamps only; they are unprovided with drying-rooms, where soldiers can air damp clothing; the hot water for the baths has to be provided by the soldiers at their own expense from the canteen funds; and some of the buildings are within a few hundred yards of the camp sewage farm.

The triennial contractor was recently struck off the list, but "Truth," in its issue of May 31st, 1900, stated: "In fact, the case, were it properly investigated, would afford valuable evidence of the corruption of military foremen of works, and the extent to which contractors are compelled, whether they like it or not, to concur in the fraudulent practices of these individuals." The sewage farm is celebrated. Dr. Seaton, Medical Officer of Health for Surrey, reported on July 31st, 1894, that it was rather a sewage marsh, with poisonous exhalations likely, if cholera visited this country, to prove of a most deadly nature. The Army Medical Department have repeatedly called the attention of the Royal Engineers to its dangers, but without avail. The latter proposed to build a large hospital within 200yds. of this sewage marsh, which has caused outbreaks of diphtheria. Mr. E. Bailey Denton, M.I.C.E., was next called in, and in July, 1895, severely reported upon its condition, declaring that the systematic neglect of years was apparent at every turn. The homestead was almost a ruin, and there was not a gate on the whole farm. The tanks at the outlets of the four outfall sewers, which were never of good design and were most unsuitable for the disposition of sludge, had fallen into decay and presented a disgraceful appearance, the large quantities of sludge collected in them giving off nauseating odours, and so on. Loss of life and health have resulted from the insanitary conditions connected with barracks and water-supply at Aldershot, although the whole camp has lately been rebuilt. A refuse-destructor was erected, which, after completion, was found to be too expensive to work and had to be standing idle.

Curragh.—This place is like Aldershot on a smaller scale, but, as usual, the building mistakes are unknown beyond the following ones of common report. The famous puddle reservoir was constructed under Colonel Bond, R.E., who spent most of his days hunting. It could not be made to hold water for five years, as the work had been done by sappers. At last English navvies had to be sent for, who were supplied by English contractors, when the tank was finally made water-tight by Mr. Woodman Hill, A.M.I.C.E. The original estimate was something like £600, while the final cost was nearly £3,000. To crown this, the reservoir has never been used, as the water was found to be unfit for drinking because the puddle clay was obtained from the sewage farm and was infested with bacteria. This sewage farm bids fair to rival that at Aldershot, being a few hundred yards to the windward of the camp, and is mostly a lake rather than a marsh. Officers' wives have become ill from eating vegetables grown on it. Concrete huts built by military labour have had to be finished by civilian contractors, owing to the length of time taken and by reason of the bad workmanship.

Gibraltar.—About ten years ago it was decided by the Royal Engineers to establish a battery of four 6in. guns near the summit of Gibraltar. It cost about £80,000 to carry out the work, and it was then discovered that 9in. guns were absolutely necessary to penetrate the armoured decks of passing vessels. The 6in. battery had consequently to be removed, and the larger guns substituted at still greater cost. While the Royal Engineers were removing, on February 20th last, a wooden frame supporting the tunnel at Genesta, at the south end of the rock, a portion of the brickwork collapsed, burying the labourers, four of whom were killed and three injured.

Malta.—The following appeared in a contemporary from the pen of a "Traveller":—Upon Imtarfa Hill, Malta, which commands the surrounding country, a vast group of new barracks was erected in 1891 at a cost of nearly half a million. It was to be expected that advantage would be taken of such a site and opportunity to construct a monument worthy of the late Queen's reign, and of which a travelling Englishman might feel proud, considering that labour and excellent building stone are so cheap in Malta that the most elaborate masonry only costs about 9d. per ft. cube. Yet this is what happened: Sketch plans to a small scale were prepared at the War Office, showing the proposed accommodation of the various buildings, and an assistant surveyor was detailed to Malta to elaborate the working drawings. This gentleman, who is a competent designer, naturally thought the one chance of his life had come, and hoped to be able to distinguish himself. A series of petty contracts were made with the native workmen for the erection of buildings, to be measured according to schedule as the work proceeded. The superintendence of the buildings was put in the hands of a captain R.E., whose fittest claim to such a responsible post was that he had had some experience in electrical engineering, but who esteemed himself able to carry out these works from the original sketches without any *professional* aid, and accordingly told the assistant surveyor that working detail drawings were quite unnecessary, and dispensed with his services. The captain R.E. then collaborated with the native workmen whenever details were required as the work proceeded, and the result naturally has been a series of abortions of designs and botches of construction absolutely shocking to a professionally-trained man. The local authorities were, however, so proud of their work that a series of official photographs was taken of the first buildings erected, and forwarded to the War Office for admiration. The letter, acknowledging their receipt, asked some ugly questions as to variations from the original sketches, and complimented the Commanding Royal Engineer on having perpetrated a series of architectural atrocities "unworthy even of a barbarous nation," and also observed that "it was evident that the R.E. officers in charge of works under the Barrack Act were not able to deal in a satisfactory manner with the details of architectural work," to reproduce the actual wording of the letter.—Last year, when some barrack building was being done at Malta, the Royal Engineer officers who had charge of the work were instructed to give certificates to the contractor from time to time to the extent of 75 per cent. of the value of the work done. While the work was still in progress they had issued certificates to an amount which exceeded the total of the contract by £345, and the paymaster paid the money. In the Auditor-General's report nothing was said about the cash having been recovered. I know one or two builders whose mouths will water for the opportunity of doing some work for the War Office under those same Engineer officers when they read this.

Mauritius.—A major R.E. caused some huts for the native troops to be thatched at so slight a slope that, although they were only up for six months, yet they were already rotten with rain which soaked through to the occupants beneath. There are nearly a hundred of these huts, and the roofs must be renewed. Thatched roofs mean liability to fire, especially in the Tropics, and in many Colonial towns they are absolutely prohibited. His successor was a captain, who confessed he knew nothing of works; still he has the handling of over £100,000 of public money. Barrack huts that were put up under him were not bolted down into the concrete foundations, and the amateur military architects both there and at the War Office would not admit the necessity. This in a place like Mauritius, famous for its hurricanes, in which the wind has a velocity exceeding a hundred miles an hour! The steel skeletons for these buildings came from England, and a mechanic was sent out by the War Office in 1900 to put them up. He was kept idling for five months before the Royal Engineers had the foundations of one hut ready for him. Then this captain sent the man home as useless, and the result was that one hut afterwards fell down during erection, killing three men and wounding oven a dozen.

Who will deny that the Army Works Department needs reform? A great many more examples of incompetence and waste could be mentioned, but I prefer that others would come forward with their experiences.—Yours truly,

BALBUS.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—All interested public servants will thank you for devoting so much of your space to the above question, and your correspondent for so able a summary of the present situation. There is no doubt that the Committee now sitting is too small, and it is matter for grave regret that at least two Members of Parliament have not seats upon it; while, as the Royal Engineers have a representative, the civil staff should certainly have had one also. Members of this staff are frequently proved to be the only persons on the different stations who are competent to pass an intelligent opinion on matters connected with the construction of barracks or fortifications; and, therefore, although they are few in number, and are snubbed and kept in the rear by the officers under whom they have the misfortune to serve, the presence of one of them on the Committee would have been some guarantee to the public that the investigation would have been impartial. The writer greatly fears that this will not be the character of the verdict. Already the evidence given is known to Royal Engineers at different places; and, when the Christmas recess is over, there will it appears be a rally to the good old flag, and the R.E. *esprit de corps*, which is the antipodes of *esprit de patrie*, will be brought to bear in full force with a view to weaken or flatly deny any antagonistic evidence which has been given. There is a strong rumour that there will be no more evidence taken from the civilian staff, only three or four members of which have, it is said, been called. At any rate the number of witnesses examined should be equal from both sides—and it is an open secret that there *are* two sides—and statements made should be fully inquired into. It is immensely difficult to prove to such a man as Lord Esher that an officer can so far forget that he is supposed to be a gentleman as to come before the Committee and declare that he *does* actually design barrack buildings, and that he does *not* lean on the surveyor on the station for his opinions or knowledge of technical or professional business, which he is supposed to do himself. The civilian surveyor is the only man who is well enough informed in the matter to throw light upon the doings of the officers with and under whom he has served, and after all it is the *doings* which test everything.

Mr. Secretary Brodrick has the thing in his own hands. If he were to order an actual test of, say a dozen officers—some from each rank—the thing could be shown up in an afternoon; but he will never get at the truth by believing every statement of the R.E. officers who may go before Lord Esher's Committee, and do a little quiet gasconading as to their achievements both in the present and in the past.—Yours truly,

THOROUGH.

The Magistracy and Sanitation.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I notice the report in your issue of December 11th of Mr. Judge's dispute with the Hampstead Borough Council, and that gentleman's letter on the subject. While sympathising with the owner of the house on the waste of money for altering an efficient drain upon the magistrate's decree, I consider equally unnecessary expenditure is often insisted on by sanitary "experts." Judging by my own experience I have found it on the whole a decided advantage to have an appeal to a magistrate in checking faddist requisitions from such reports, as well as the autocratic dicta of over-zealous sanitary inspectors. Some of these last-named officials are so arrogant as to publicly express desire for the abolition of all control whatever. (See Report of Conference of Sanitary Institute, 1900.) What would be the effect of an autocracy composed of an unpractical M.D. as M.O.H., and one of the better class plumbers elevated to the position of sanitary inspector and seeking to magnify his office at the ratepayers' (his employers) expense, may well be imagined. On the other hand I do not hesitate to say that the unreasonable condemnation of existing house drains by so-called "Sanitary Engineers" has helped in promulgating fads, fancies and fallacies which cause waste of money. In many cases a uniform gradient is not necessary for efficient working—in others it may well be so. I have not yet had magisterial condemnation of a drain solely on that ground, but by the new by-laws of the L.C.C. we must expect this in the future, in some cases even necessitating a manhole of 10ft. deep or more if the public sewer is deep, and danger to the foundations by excavation of trenches in narrow places. This is a serious objection. A commonsense interpretation of the statutes by magistrates has certainly checked abuse of power by a Sanitary Department, and to do away with such a veto would be to avoid Scylla and fall into the Charybdis of official tyranny.—Yours truly,
E. W. HUDSON, A.R.I.B.A., F.S.I.

The Churchyard Cross at Harberton.

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—Your correspondent, in the note on "Crosses" on page 313 of your issue for December 18th, is mistaken in assuming that this cross (which is the finest of all our fifteenth-century graveyard crosses) has recently been restored by Sir Robert Harvey; and he is equally in error in the belief that Charles Kingsley was born at Harberton, or, indeed, anywhere in the immediate locality. Kingsley was born at Holne Vicarage (on the banks of the Dart, near its source on the southern fringe of Dartmoor). The church of St. Mary the Virgin at Holne contains the most interesting (oak) fifteenth-century pulpit in the country. At the investigation of the late Sir G. Gilbert Scott, R.A., I took plaster-casts of much of it, fully thirty-five years ago.

There are two ancient crosses at Harberton—both of the same date. The one already referred to stands near the south-western porch of St. Andrew's graveyard; the other is at the junction of some crossways outside the village. The latter is of Devonshire grey granite; the former, of local freestone. Both of them were carefully renovated by my sons and self during 1895, and early in 1896, under the direction of Mr. W. M. Tollitt, architect, of Totnes.

Mention is made in the same paragraph of the churchyard cross which we erected this year at St. Mary's, Haggerston, N.E. It may be worthy of record that this particular cross only got into its present position by a fluke. We made it for the donoress as a memorial to her late husband, a Cornish vicar, and it was destined to stand in the graveyard of St. Andrew, at Stratton in the north-east of Cornwall; but the present vicar did not agree with the donoress as to the site of his predecessor's cenotaph, and the upshot was the lady changed her mind, and by her directions we erected it where it now stands in North-east London.—Yours truly,

HARRY HEMS.

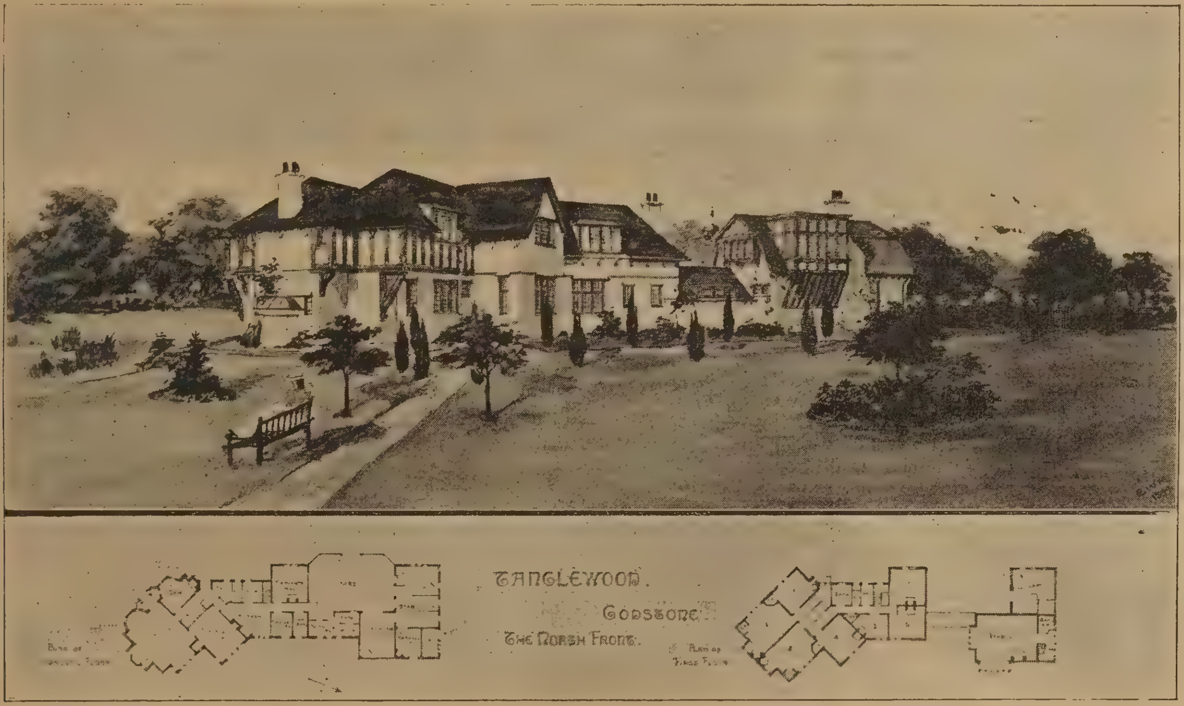
Masters and Men.

The Penrhyn Dispute. – One of the most remarkable points connected with the long-standing dispute at the Penrhyn quarries is the similarity of the claims of the men on strike to-day and those of the men who came out three-quarters of a century ago. Then, as now, the workers complained of inequality of wages, of favouritism at the quarries, of the alleged unfairness of officials, and of the oppression of the men.

Increase in Price of Slates.—Owing to the prolonged strike at the Penrhyn Quarry, and the further reduction in the output of slate consequent upon the large falls in other important quarries, slate producers and merchants have decided to increase the price of Carnarvonshire slates by 2½ per cent. or more, according to the demand. This has been promptly followed by a demand on the part of the Moeltryfan quarrymen, numbering between 400 and 500, for an increase of wages.

TANGLEWOOD, GODSTONE.

THIS house is built of local bricks, roughcasted an almost white colour. On the south front are three panels of open mosaic worked direct into the rough-cast, in a conventional representation of a "tangle" of orange and lemon trees. The constructional woodwork throughout is of oak, and the same wood is largely used in the panelling, &c., in the interior, while the floors are of teak. The plan has its back broken, partly for effect and partly that while the main length of the house should be parallel to the road, the private portion should stand looking across the ponds formed in the old clay workings to the view beyond. Mr. E. W. Marshall is the architect.



WOODS.*

THEIR STRUCTURE AND SELECTION.

By HERBERT STONE.

THE subject upon which I have the honour of addressing you is incomplete and, as yet, quite in its infancy. As a scientific study it is by no means new, but the technical application of it may be said to be comparatively recent, as might be expected, because a certain amount of progress must be made and sufficient methodically-arranged information must be accumulated before the commercial man can employ it usefully. In short, until science has something substantial to offer, which will stand the commercial test, it is far better to continue the use of the old rule-of-thumb methods, which, after all, have sufficed to make the world go round till now. Whether the art of discriminating the various species of timber has arrived at that desirable stage I must leave it to your judgment to decide, but I feel that a ventilation of the subject must be productive of good, and hope that it will arouse sufficient interest to bring recruits to this enquiry.

The Indefinite Knowledge of Woods.

The carpenter knows the woods he works with from continually handling them, and can, perhaps, distinguish a dozen or twenty of them with ease, but beyond these he is at sea. The timber merchant dealing in hardwoods has a longer list of familiar woods, and having spent his days amongst them he becomes an authority upon them. But the process of handing a strange piece of wood round until someone is found who knows it, is a part of the daily routine even at the oldest houses.

Many hundreds of consignments of excellent timber reach our shores, and failing sufficient information as to their name, origin and virtues, are passed by purchasers until they are finally relegated to a rummage sale, where all "unrated" timber is put up to auction for the purpose of recovering the freight and dock dues. Amongst these "unrated" woods have been many which have excited admiration for their beauty or other excellence, and in some cases have changed hands at fancy prices after the discovery of their value.

If you will look through any old list of hardwoods you will see the names of many that were familiar years ago, but which are not now met with. Did the consumption of the timber trade of the last generation exterminate these trees? I cannot believe it, for even if a small locality were entirely stripped of a species, there are few that are confined to such small areas. Possibly, if they grow elsewhere, and I hope that with the increasing means of identification which the anatomical characters afford, we may not only discover the species, but also indicate in what other regions a fresh supply of our lost timbers may be found.

Necessity for Authenticated Specimens.

To base this art upon a secure foundation, it is absolutely necessary to obtain authenticated specimens. One may describe the structure of the African oak, and it may be an advantage to identify other specimens of African oak from the description, but it will be useless for a purchaser to enquire for it under that name in localities where it is called African teak. With this view I have appealed to the Colonial Office for authenticated specimens of all Colonial timbers, so that their structure may be put on record, thus enabling not only our home traders to recognise unfamiliar Colonial timbers when they meet with them here, and to satisfy their wants by purchases from our brethren of Greater Britain, but also to enable our colonists to recognise their own woods for their own uses; for if experts are scarce in England they must be far rarer in new countries. Besides this, our settlers had a limited knowledge of English trees when they left our shores, consisting of a few names such as oak, beech, ash, elm, pine, &c., and every tree they met with in their new home became native oak, native beech, &c., with the variation of a few simple adjectives, such as red ash or black ash. When these become exhausted, the alternatives are red wood, white wood, yellow wood, iron wood, &c.; hence we must not be astonished to find that in different parts of Australia no fewer than five distinct species of eucalyptus pass under the name of red gum, and two or more under that of blue gum.

I have already obtained promises of authenticated specimens of the woods of Canada, the Cape of Good Hope, Victoria, Queensland, Western Australia, Lagos, and Rhodesia, and, with one or two exceptions, I have very little doubt that a similar response will be received from those Governments which have not yet replied. In my petition I have asked for a specimen of each wood sufficiently large to provide duplicates for several public institutions.

Annual Rings.

It must be clearly understood that the width of the annual rings, the most conspicuous feature in woods, is rarely of any value. A ring of oakwood may be $\frac{1}{4}$in. wide, or may reach $\frac{5}{8}$in., and the difference in the appearance of a piece of wood containing sixteen rings per inch of radius and another only showing two is exceedingly difficult to reconcile. This variation is merely a question of growth, and depends upon the fertility of the soil, &c., so that the extremes may frequently be present in the same piece of wood in the closest proximity. The full character of the structure is unfortunately only brought out in broad well-developed rings, and it is by no means rare to find a specimen with which nothing can be done, because no ring is broad enough to show the structure of the autumn wood. Search then always for the broadest ring.

Pores.

An essential point to be noticed is the presence or absence of true pores, which may be recognised by their abundance in the inner side of the ring. They are never more abundant in the autumn wood, even when uniformly occupying the whole section. If pores appear in the outer or middle part of the ring while the inner is free from them, be sure that they are resin pores, and that the wood you are dealing with is a conifer, and probably a pine or spruce. The rays are always present, even when microscopic, but they vary greatly in breadth, height, lustre, straightness, &c., each detail having its own particular value. A close examination of an oaken block will reveal a number of cloudy bands running concentrically with the annual rings. These are composed of wood parenchyma, or soft tissue as I shall call it, and are usually present in well-developed rings in all the oaks.

One of the difficulties of this study is the unending fluctuation of the size in the various parts. The variation which most meets the eye, that of the annual rings, has already been referred to. Next to this the coarseness of the pores chiefly affects the appearance of a wood. This depends more upon age than upon nourishment, and in many woods, such as the oak, the average size of the pores augments from year to year till the tree reaches its prime, and then becomes more or less constant. Other woods show their variation in a much less degree.

Age and Weight.

There is considerable harmony in the variation of the characters of wood, both physical and anatomical. The weight per cubic foot, the hardness, the state of saturation, amount of ash, the elasticity, &c., vary regularly, according to age and distance from the root of the tree. Weight is found to increase from the foot to the first branches, and then to decrease from that point upwards. The size of the rays, cells, and vessels, as already stated, increases with age, so that in the eightieth yearly ring of an oak, counting from the pith outwards, these parts will be much larger than in the first. It must be borne in mind that the eightieth ring was produced seventy-nine years later than the first, so that we must be careful not to confound the age of the tree with the age of its wood.

Similarly, inasmuch as the sapling oak of one year is but a fractional part of the weight of the mature tree, and as the growth in height has been caused by the super-position of additional coats of wood one upon another, like so many cones, it follows that the wood of the upper parts must be younger, and therefore the innermost ring of this upper wood must not be assumed to be old because of its position. It is natural to assume this, and many would count the rings on a piece of wood from the upper part of a trunk, and pronounce it to be of such and such an age, whereas that may not be within fifty years of the truth.

Many tropical woods show scarcely any perceptible division between the growth of one year and the next. Their growth seems free from any check, though it may vary in vigour. Hence the familiar ring-boundaries become vague or entirely lost; even the rise and fall in the size of the pores is frequently absent, and they seem to increase uninterruptedly from the pith outwards to the bark.

I think one obtains a more securely based conception of what wood is by commencing to study it in the solid instead of by macerations, or even thin sections. To study the cells first under high powers is, to my mind, beginning at the wrong end.

A Key.

For my own use I have constructed a key which will perhaps prove useful to others. As it seems to me, amongst the woods of the broad-leaved trees the rays are the most constant character. I base my divisions upon them, first separating those woods having two kinds of rays, as many cupuliferæ, from those which have but one. I then divide the latter into those whose rays are separated by intervals greater or less than the transverse diameter of their larger pores; that is to say, the intervals between some may be equal to the pore diameter at the most, and conversely in the other class the intervals may be equal to the pore diameter, but never less. Further sub-divisions, which it would be tedious to detail, are based upon the presence of soft tissue and its arrangement, followed by the arrangement of the pores, concluding with the degree of definiteness of the ring boundary.

Hardness: And an Instrument for Determining It.

In every description of wood, by a practical man the elements of weight, hardness and colour are considered. Sometimes the weight per cub. ft. is given, and the colour, apart from its fluctuations, is often accurately pictured, but the hardness is a quality which is practically left to our imagination. I have been so much impressed with the necessity of some means of measuring the degree of hardness that I have constructed an instrument which is capable of giving a fairly accurate reading of the resistance to impact of a wood (not of its hardness pure and simple, because the resistance to impact is made up of elasticity plus hardness), but it is a fair parallel to the impression of that which we call the hardness makes upon our sense of touch. I will not weary you with a description of this contrivance, but will merely mention that the principle is as follows: A steel ball of a known weight falling a definite distance upon a surface at an angle of half a right angle will fly off in a horizontal direction, and describe a curve or trajectory which will be longer or shorter according to the amount of force absorbed by the wood. A self-recording arrangement and all necessary adjustments are attached to the machine. The hard and soft zones of a wood give different readings, so that a number of trials have to be made and an average struck. I take the average of ten trials, displacing the wood five millimetres between each.

Municipal Buildings for Dorking.—The Dorking Urban Council have received a munificent offer from Lily, Duchess of Marlborough, which will enable the Council to carry out their idea of combining municipal offices and a new post-office in one building. Some time ago, with the full concurrence of the postal authorities, the Council drew up a scheme and had plans prepared for the erection of such a building, but the Local Government Board refused to sanction a loan on the local rates for a building which was to be used in part by a Government department. At this juncture her Grace purchased a site for £2,400, and offered to erect a building which will serve as a new post-office as well as Council offices. The Postmaster-General has agreed to take a lease of part of the premises for thirty years on terms similar to those previously arranged with the Council, and the Council have leased the remainder for a like period at £80.

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* Summary of a paper read before the Society of Arts on December 4th, 1901.

Builders' Notes.

The Newport (Mon.) Master-Builders' Association held its annual dinner recently, Councillor W. M. Blackburn presiding.

St. Thomas is the patron of masons and architects, from the tradition that a large sum of money was given him to erect a palatial building, but he spent the money on the poor, thus building a palace in Heaven.

Mr. Thomas Axtell, of 17, Speedwell Street, Oxford, died recently at the age of seventy-five years. For many years the deceased was connected with the firm of Symm & Co., builders; and under his personal directions several important building operations in the University and colleges have been carried out.

Sheffield Builders' Exchange.—A complimentary dinner was given recently by the Sheffield Master-Builders to the workmen employed upon the new Builders' Exchange, which is being erected in Upper Charles Street. No time has been lost over the building, which will in all probability be ready for opening in May; the contractors have now got to the roof of the building. The new exchange, which will also serve the purposes of a club, is to cost £8,000, and the membership will be confined to the building and allied trades.

Kirkcaldy Building and Heritable Security Co., Ltd.—An extraordinary meeting of the shareholders was recently held in connection with the disappearance of the manager, David Thomson, solicitor, who disappeared on November 15th last, leaving a deficiency of £13,919 12s. 3d.—Mr. Alexander Balfour moved: "That it has been proved to the satisfaction of this meeting that the company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind up the same, and accordingly that the company be wound up voluntarily." This motion, however, was not carried. The vote was as follows: For the motion, 1,026; against the motion, 95; declined to vote, 889.

New Buildings in Ayr.—An unusual number of buildings of a public or semi-public character are at present in course of erection or have just been completed at Ayr. Chief among these is the new town hall, which is being reconstructed on the old site from designs by Mr. J. K. Hunter, architect, Ayr, at a cost of about £10,000. A new theatre, the first real theatre that has ever been in Ayr, is being erected for a company on the site of a previous wooden structure, in Carrick Street, by Mr. J. M'Hardy Young, architect, Ayr, at a cost of more than £7,000. A new drill hall and headquarters for the 2nd Volunteer Battalion Royal Scots Fusiliers has been commenced at the south end of Alloway Street, from designs by Mr. James A. Morris, architect, Ayr. A block of buildings is being erected in High Street for the British Linen Banking Co. A large addition to the Ayr Corporation electric light and electric tramways station in Mill Street is nearing completion. A large new church is being built in Midton Road, to be known as Trinity United Free Church. The Glasgow & South-Western Railway Co. have in hand in the vicinity of Newton-on-Ayr Station the installation of a complete plant for the manufacture of oil-gas for the lighting of their railway carriages, to obviate the necessity of having to supply the light from Glasgow. The new iron railway bridge for the same company across the upper end of Ayr harbour is being finished. A large new shoe factory for Mr. Andrew Greenlees, Maybole, has been erected in the neighbourhood of Newton-on-Ayr Station, and is now in operation. In addition to these a large number of dwelling-houses, comprising villas and blocks of workmen's dwellings, are being erected in all parts of the town where there is vacant ground, and especially in the Craigie district.

Abbot Wakeman's Cenotaph in Tewkesbury Abbey.—The drawing of this cenotaph published in our issue for December 18th last was made by Mr. Benjamin Bower, architect and surveyor, of Birmingham.

Keystones.

Mr. Robert William Pollard, architect, of Brighton, died recently.

A Police Station in Ashley Road, Burmantofts, Leeds, is proposed to be erected.

A New Stained-Glass Window at Gorton Parish Church was dedicated recently. Mr. H. Gustave Hiller prepared the cartoons, and Mr. Reuben Bennett, of Old Trafford, erected the window.

Public Officials and Private Practice.—At a Council meeting of the Society of Architects held on December 19th last, it was unanimously resolved "that this Society is of opinion that it would be in the best interests of the public if architects, surveyors and engineers holding official appointments be debarred from private practice."

A Baptismal Font has been erected in the new United Free Church, Edzell, of a Caen stone basin and base, with a highly polished Connemara green marble shaft. The detail is delicate, and the work has been executed by Mr. James Bremner, sculptor, under the direction of Messrs. Thoms & Wilkie, architects, of Dundee.

New Board Schools at Balderton are about to be erected from plans by Messrs. Saunders & Saunders, Arcade Chambers, Newark, at an estimated cost of about £2,700. The materials are local bricks laid in blue lias lime mortar, relieved by simple stone dressings. Accommodation for 300 children, by six class-rooms of a capacity of fifty children each, will be provided.

A Hungarian National Monument.—The Hungarians are about to erect a colossal monument to the memory of Arpad, the founder of their kingdom. It will be placed on the top of the Banhida Mountain, and consists of a gigantic representation of the legendary bird of Hungary. The animal is in bronze, and costs £4,000, which was publicly subscribed. The sculptor was Donath Gyula.

A New Country-House at Murtle, N.B., is being erected for Mr. W. R. Freeman, of London. The design is Elizabethan in style. Mr. J. Coates Carter, F.R.I.B.A., Cardiff, is the architect; and the contractors are:—Mason work, Mr. John Morgan; carpenter work, Messrs. D. Macandrew & Co.; plumber work, Messrs. A. Lamb & Son; tiled work, Messrs. M'Gregor & Shand; plasterers, Messrs. Sellar & Co.; painters, Messrs. J. & S. Fyfe. The cost of the erection of the building is estimated to amount to about £6,000.

The Ancient Church of St. Michael, Manningtree, was reopened recently after renovation. The edifice dates from 1616, and much of the original oak used in the construction is still to be seen. In 1821 it was enlarged and repaired; in 1840 the present chancel was added. The old-fashioned high pews have now been replaced by modern kauri and red pine seats, painted dark red; a new floor with tiled aisles has been laid, and a new pulpit, lectern, choir stalls, chancel rails, &c., painted light green, have been introduced. The centre of the chancel and the altar have been raised. Incandescent gas-burners have been fitted. The organ has been overhauled; the roof has been repaired, and the whole building has been repainted and decorated. The cost of these extensive operations is £700. The contractors were Messrs. S. Parsons & Sons, of Manningtree, Messrs. W. Capon & Son carrying out the furnishing. Mr. J. Lucas, F.R.I.B.A., of Hitchin, was the architect.

St. Peter's Church, Bury, was opened recently after rebuilding. The church was originally built, at a cost of £4,800, thirty years ago. A few years ago, however, the structure began to show signs of insecurity, and ultimately it was deemed advisable to obtain the advice of an architect, and Mr. Medland Taylor, of Manchester, was consulted. As a result of his examination and report, it was decided to rebuild, and the contract was secured by Mr. Charles Brierley, of Fishpool, Bury. The cost of rebuilding has been nearly £6,000. Structurally the building is similar in outline to the original church, but the side walls are higher than the old ones; the windows have been raised so as to obviate the possibility of draught, the buttresses have been strengthened, the vestries enlarged, and a large porch on the west has been erected. For want of funds a spire has not yet been built.

A Rowton Lodging-House in Grove End Road is proposed to be erected.

Mr. Norman Shaw has, we understand, withdrawn—for the time being—his resignation from the Royal Academy, in deference to the wishes of the Council.

Mr. W. L. Kay has been appointed chief architectural assistant in the City Engineer's Department, Coventry, at a salary of £165 per annum.

A New Hall for Trinity Church.—A New Parochial Hall for Trinity Church, St. John's Wood, is being erected by Messrs. Sherwin & Son, of Boston, for £2,401. It will seat 325 people. Mr. Horace Field is the architect.

The "Little Palace" of Fine Arts in the Champs Elysées is henceforward to be known as the Palais des Beaux-Arts de la Ville de Paris, and a capable committee has been named to form a collection from the art works belonging to the city.

The Criterion Theatre.—A scheme has been approved both by the London County Council and Mr. Wyndham for rendering the Criterion Theatre a safer public resort. Property to be purchased on the Jermyn Street side will enable exits to be provided sufficient to give ample and direct means of egress to the streets.

A Reredos has just been erected in Kinlet Church, Shropshire, as a memorial to the late Major Charles Baldwyn Childe. It is richly carved in alabaster in harmony with the other tombs and monuments of this old county family. The work has been carried out by Mr. Bridgeman, of Lichfield, from the designs of Mr. Oldrid Scott.

An Old Norman Font that for eighty years has been lying neglected and desecrated in the North Riding Parish of Marske-by-the-Sea has been renovated and restored to its original purpose. The old church of St. Germain at Marske, dating from the twelfth century, was pulled down in 1820, and as no one seems to have thought that the font was worth preserving it found its way to a farmyard. Subsequently it was rescued and converted into a flower vase for the vicarage garden. That was a long time ago, and now it has been restored. The old font is square in form, with a column or pilaster at the angles, each face ornamented with bold carved work of Norman character. The font has been placed on a suitable base, adapted from that of a similar font in Northamptonshire.

The Decoration of the Blackpool Council Chamber has now been completed. It is in English Renaissance style. The coved ceiling is decorated in boldly-modelled plasterwork, and has been subjected to a very simple colour treatment. The walls are framed in with a high dado and pilasters in oak left unpolished in its natural colour. The wall-surfaces left uncovered by the oak have been formed into five panels, two of which are treated with conventional ornament and armorial bearings, while the remaining three spaces are decorated with fine pictures illustrating episodes in Lancashire history. The internal fittings are all in oak. The pictures were painted by Mr. J. R. Brown, the superintendent of the art department of Messrs. Goodall, Lamb & Heighway, Ltd., who carried out the work under the superintendence of Messrs. Potts, Son & Hennings, the architects of the building.

Manningtree Church has been reopened after renovation. The edifice dates from 1616, and much of the original oak used in the construction is still to be seen. In 1821 it was enlarged and repaired, in 1840 the present chancel was added, and now it has been brought more up to date. The old-fashioned high pews have been replaced by modern kauri and red pine seats, painted dark red; a new floor, with tiled aisles, has been laid; and a new pulpit, lectern, choir stalls, chancel rails, &c, painted light green, have been introduced; the centre of the chancel and the altar have been raised. Incandescent gas-burners have beed fitted. The organ has been overhauled; the roof has been repaired, and the whole building has been repainted and decorated. The cost of these extensive operations is £700. The contractors were Messrs. S. Parsons & Sons, of Manningtree; Messrs. Capon & Sons carrying out the furnishing. Mr. J. Lucas, F.R.I.B.A., of Hitchin, was the architect.

The New Cathedral at Westminster is to be opened on June 29th next—three days after the King's Coronation.

The Clones Rural District Council have appointed Mr. Thomas O'Brien, Swanlinbar, County Cavan, as architect and surveyor, in connection with the Council's scheme for the erection of thirty-nine labourers' cottages.

Mr. Alfred Waterhouse, R.A., it is announced, has retired from the presidency of the National Society for Checking the Abuses of Public Advertising—this, unfortunately, owing to ill-health.

The Pergamon Museum in Berlin, which was recently opened by the Kaiser, has cost £42,500, and contains a number of portions of Greek sculpture and architecture which once adorned the temple on the heights of Pergamon (erected between 197 and 159 B.C. to Zeus and Athene).

New Board Schools at Gravesend have been built from designs by Mr. S. I. Adams, of Southend. They provide accommodation for 520 boys and girls and 254 infants. Messrs. C. P. Kinwell, of Gravesend, installed the hot-water radiators and pipes, and Messrs. Adams the sanitary fittings. The amount of the contract for the schools and caretaker's house was £9,575.

Mr. John B. McDonald, R.S.A., died recently at the age of seventy-three. He was one of the McDonalds of Keppoch, and was born at Boharm, Morayshire. He received his early education in his native parish, and for a short time was attached to farm life. He developed a taste for art, and came to Edinburgh in 1852, where he attended the Board of Trustees' School of Art. Afterwards he studied under Robert Scott Lauder, and received several prizes from the Royal Scottish Academy.

The Bismarck Monument for Hamburg.—Two hundred and fifty German sculptors and architects have sent in models and designs for the proposed Bismarck monument at Hamburg. The museum at Hamburg was too small for the exhibition of all the designs, and they are accordingly placed for public view in the Velodrome. The city of Hamburg proposes to spend four hundred thousand marks on the monument, including thirty thousand marks for ten prizes, the distribution of which will be decided by the jury to-morrow.

The Steeple of Chesterfield Parish Church is often called the "corkscrew" steeple, for it has got quite a big twist. This is due to the action of the sun on the wooden and iron materials, and the warping is more pronounced in the case of Chesterfield Church than in any other church in the country. Barnstaple and Bristol, and one or two other places, have leaning steeples, but their tendency is decidedly to "lean" and not to "twist." The church at Chesterfield is the nearest rival in the United Kingdom to the leaning tower at Pisa.

New Board Schools at Northfleet have been erected on a site at the corner of Dover and Springfield Roads. The architect is Mr. S. I. Adams, of Southend; and Messrs. Multon & Wallis, of Gravesend, are the builders. The schools accommodate 520 boys and girls, and 254 infants, and are built of bricks. Inside are used hard wire-cut bricks, and faced with red bricks, with guaged arches and Monks Park stone dressings. The roof is covered with Perfecta plain tiles. The walls of class rooms have a cement dado, and are dinged above and distempered. The corridors have glazed brick dado with dinging above. The wood principals and purlins where seen, are stained green. The whole schools are heated by hot water radiators and, pipes, which were supplied and fixed by Messrs. C. P. Kinnell, of Southwark Street. The ventilation appliances were supplied by Messrs. Kite, of Euston Road. The sanitary fittings are supplied by Messrs. Adams, of Westminster. The cloakrooms are of Stuart's granolithic paving. The front entrance is of terrazzo, laid by Mr. Bennett, of Dashwood House, Broad Street. The furniture for the schools was made and fixed by Messrs. Bennett & Co., of Old Kent Road. The hat and cloak-hooks are the Schola, made and supplied by Messrs. Brookes & Co. The amount of the contract for the schools and caretaker's house was £9,575. The quantities were taken off by Mr. G. T. G. Wright, of Winchester Street.

At the Dundee Liberal Association Rooms a panel, executed by Mr. Stewart Carmichael, has been fixed on the wall of the billiard-room. It is intended to show the progress of Scottish liberty by typical figures selected from the history of the nation from early times to the present day.

Rubislaw Parish Church has been improved by the filling in of the apse windows, nine in number, with stained-glass, designed and manufactured by Mr. John Whyte, Aberdeen. The church is being further improved by the introduction of electric lighting—the gift of Mr. Harvey Hall.

Change of Address.—Mr. J. S. Gibson has removed his offices to 27A, Old Bond Street, London, W., where his practice will be carried on, together with that of Mr. William Wallace, under the designation of Messrs. Wallace & Gibson, architects.

Old Hampstead.—Part of the Well Walk, Hampstead, and "The Grove" are threatened with destruction by the London School Board. With regard to the latter, it is interesting to note that just across the road is Constable's first home in Hampstead, No. 2, Lower Terrace, the home also of Sir Gilbert Scott.

The Dorman Museum at Middlesbrough, which is to be built on the south side of the Park entrance, will be about 85ft. sq., with an entrance hall 15ft. sq. The height of the building will be 25ft., but a dome will surmount the entrance hall, and will rise to 56ft. Another dome will be placed over one of the side galleries.

A new Congregational Church at Bury Park, Luton, Beds, is to be erected. The designs of Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines have been accepted. The estimated cost is £3,590, inclusive of a tower. The seating accommodation is for 533 persons. The facings are of red bricks and dressings of bath stone.

Baptist Church and Schools, Blackhorse Road, Walthamstow.—The competitive designs for this church submitted by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C., have been adopted The accommodation provided in church is 812 adults. The estimated cost, including tower, is £4,471.

Leeds and Yorkshire Architectural Society.—In the "Green Book" for the session 1901–2 it is stated that there has been a slight increase in the membership, which now totals 119. The Council observe that the competition for the Society's prizes was most meagre. There was no competition whatever for the silver medal or for the prizes for design and construction, only one competitor for the sketching prize, and only one for the essay prize. They trust that the competition will be much keener this year. The accounts of the Society show a balance in the bank, and petty cash, of £87 19s. 9½d.

The Glasgow Architectural Craftsmen's Society.—At the sixth meeting of the session held on Friday, 20th ult., two papers were read. In the first Mr. W. G. Peddie, clerk of works, spoke on "Wall and Floor Tiles." He described the historical development of the tile industry, and showed samples of old Dutch and Persian tiles. He exhibited samples of modern tiles in various stages of their manufacture, and discussed the terms: "self-coloured," "encaustic," "glazed," "vitrified" and "enamelled." In the second paper Mr. McKim dealt with "Substitutes for Tiles." He showed samples of and described ceramic mosaic, marble mosaic, Venetian terrazzo, opalite and crystopal and Marmot tiling.

Leeds Baths Competition.—Sixteen sets of competitive plans were sent in for the building of Corporation baths and a public free library in York Road, Leeds. The Baths and Library Committees have confirmed the award of the assessor, Mr. Leonard Stokes, F.R.I.B.A., giving the three premiums to Leeds architects, as follows: 1, £50, Mr. H. Ascough Chapman, A.R.I.B.A., East Parade; 2, £30, Mr. W. Bakewell, Park Square; 3, £15, Mr. Percy Robinson, Albion Street. The buildings will be two-storeyed, of brick with stone dressings, and will cost about £15,000. The baths will be in All Saints' Place. The swimming bath will be 75ft. by 30ft. Special features will consist of a Russian bath and provision for school children. The library is excellently planned, a new departure which will prove popular being a public lecture hall.

New Patents.

The following specifications were published on Saturday last, and are open to opposition until February 11th, 1902. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1900.—22,014, DOULTON, water-supply valves. 22,113, ROSE, drain-cleansing and repairing machine. 22,245, GREEN, cranes, hoists, &c. 22,248, WADDELL, optical instruments for range-finding and other measuring and surveying purposes. 22,305, HADDAN (*Whiting*), sluice gates for waterways. 22,499, JARVIS, WADKIN & KING, glazing bars. 22,549, JACKSON & FEARNLEY, safety apparatus for hoists or lifts.

1901.— 801, RIGBY, kiln for Portland cement or lime. 1,692, ROOVERS, regulator for controlling gas supply to bath heaters. 2,276, LONG, locks. 2,499, WILKINSON, slabs for building. 4,063, LEGGE & CHILTON, door-bolts. 8,737, PEART & FOXON, double-acting saws. 11,890, MONK, reversible casement windows. 16,165, BROWNE, chimney top. 19,714, SMITH & SHEPHERD, door-holder. 19,715, SMITH & SHEPHERD, sash-fastener. 21,775, HADDAN (*Wallace*), valves. 21,965, THIBAUT, facing walls with enamelled sheet-metal.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	12	6
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	2	0	0
OILS AND PAINTS.							
Castor Oil, French	per cwt.	1	7	0	1	8	7
Colza Oil, English	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels	do	1	10	3		—	
Petroleum, American	per gal.	0	0	6⅞	0	0	7¼
Do. Russian	do.	0	0	6¼	0	0	6¾
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	6	4	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	11	0		—	
Tar, Stockholm	per barrel	1	4	6		—	
Turpentine	per cwt.	1	7	6		—	
METALS.							
Copper, sheet, strong	per ton	71	0	0		—	
Iron, Staffs., bar	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0		—	
Lead, pig, Soft Foreign	do.	10	5	0		—	
Do. do. English common brands	do.	10	12	6	10	15	0
Do. sheet, English 3lb per sq. ft. and upwards	do.	11	17	6		—	
Do. pipe	do.	12	5	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	0	0		—	
Do. floor brads	do.	8	15	0		—	
Steel, Staffs., Girders and Angles	per ton	6	0	0	6	5	0
Do. Do. Mild bars	do.	6	15	0	7	5	0
Tin, Foreign	do.	105	15	0	106	5	0
Do. English ingots	do.	110	0	0		—	
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	15	0	17	2	6
TIMBER.							
SOFT WOODS.							
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec, Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	10
Do. Petersburg	per bundle	0	0	9	0	0	0½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	0	0		—	
Do. do. 2nd "	do.	12	10	0		—	
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st	do.	27	5	0		—	
Do. do. 2nd	do.	12	15	10	13	0	0
Do. do. 3rd &c.	do.	9	10	0		—	
Do. Canadian Spruce, 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	7	15	0	9	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	5	10	6	11	5	0
Flooring Boards 1in. prepared, 1st	per square	0	11	3		—	
Do. 2nd	do.	0	10			—	
Do. 3rd &c.	do.	0	9	3		—	
HARD WOODS.							
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

AXMINSTER.—For the erection of Devon and Cornwall Bank new premises, Axminster. Mr. Ernest A. Pryer, architect, Dunheved Chambers, Axminster:—

C. Turner, Honiton	£2,250
J. W. & H. Childs, Yeovil	2,157
E. R. Bartlett & Son, Yeovil	2,015
Woodman & Son, Exeter	1,952
J. G. Sprackling, Beaminster	1,885
Cloud & Newbery, Axminster	1,843
Stephens & Sons, Ltd., Exeter	1,832
Parsons & Clarke, Axminster	1,820

BRISTOL.—For the builder and plumber's work connected with the enlargement of the Easton School, for the Bristol School Board. Mr. J. Mackay, architect, Kingswood, Bristol:—

Building.

J. Hatherly, Penarth Lodge, Brislington	£2,487	0	0
W. & J. Bennett, 162 Pennywell Road	2,400	0	0
S. Williams, Redfield, Bristol	2,349	0	0
F. Brown, Elmgrove Road, Easton	2,330	0	0
E. Love, Hampton Road, Redland	2,297	0	0
R. Wilkins & Sons, Surrey Street, St. Paul's, Bristol	2,279	0	0
E. Walters, Richmond Road, Montpelier	2,178	0	0
G. Humphreys,* Stapleton Road, Bristol	2,142	0	0

Plumbing.

A. E. Wilkins, Surrey Street, St. Paul's	153	0	0
H. H. Stennard, Gloucester Road, Bishopston	146	17	6
A. E. W. Blissett, 122 Redcliffe Hill	137	0	0
J. E. B. James, 17 Milk Street, Bristol	129	0	0
J. Wilkins, 6 St. Nicholas Road, St. Paul's	125	0	0
S. H. Povey,* 9 Ashley Hill	117	0	0

* Accepted.

CONISBOROUGH (YORKS.).—For the erection of the Doncaster and Mexborough Isolation Hospital, near Conisborough. Mr. J. H. Morton, F.R.I.B.A., architect, South Shields:—

J. Woods, Gainsborough	£17,544	6	7
C. Green & Co., Rotherham	14,201	15	8
Walker & Slater, Derby	13,450	0	0
Dennis, Gill & Son, Doncaster	12,923	6	0
G. H. Smith, Mexborough	12,851	5	11
J. G. Cooling, Gainsborough	12,248	2	8
F. W Denholm & Co., Wakefield	12,107	10	9
H. Arnold & Son, Doncaster	11,975	0	0
M. Grantham, Sheffield	11,970	9	4

[Architect's estimate, £12,250.]

DEVONPORT.—For the construction of stoneware pipe sewers, with manholes, ventilators, and other works incidental thereto. Mr. James Diggle, C.E., F.G.S., Heywood, Lancashire, engineer. Mr. John F. Burns, borough surveyor:—

H. E. Skinner, Plymouth	£7,146	18
F. Kellet & Co., Plymouth	6,007	0
Matcham & Co., Plymouth	5,967	0
W. E. Blake, Plymouth	5,735	0
Pearce Bros., Plymouth	5,720	0
W. C. Shaddock, Plymouth	5,150	0
R. H. B. Neal, Plymouth	5,126	0
A. N. Coles, Plymouth	5,008	0
J. & F. Binns, Blagdon	4,806	0
J. C. Lang, Liskeard	4,747	0
S. Roberts, Plymouth	4,661	0
Johnson & Langley, Leicester	4,303	0
T. Shaddock,* Plymouth	3,901	0

* Accepted.

ENFIELD (MIDDLESEX).—For carrying out certain works of patent artificial stone paving, granite kerbing, and granite sett paving on the main road in the district of Enfield, Middlesex, for the Middlesex County Council. Mr. Henry T. Wakelam, county surveyor, Guildhall, Westminster:—

Walker & Son, Leeds (flags, own make, of granite chippings and cement)	£12,390	0	0
G. Anderson, Poplar (patent Victoria)	11,166	0	0
G. Anderson (patent non-slip)	10,916	0	0
W. Gibbs, Limehouse (patent Victoria)	10,564	9	2
Imperial Stone Co. (patent Imperial stone)	10,500	0	0
Hard York Non-Slip Co. (hard York non-slip)	10,454	10	7
G. Anderson (patent Imperial)	10,416	0	0
G. Anderson (patent adamant)	10,332	0	0
E. J. Betts, Enfield (patent Imperial)	10,312	0	0
E. J. Betts (Croft's adamant)	10,230	0	0
Wimpey & Co. (2-in. Victoria)	10,204	0	0
Lawrence & Thacker, Clapham (patent indurated)	10,200	0	0
G. Anderson (patent Victoria, indurated)	10,165	0	0
E. J. Betts (Threlkeld stone)	10,150	0	0
W. Manders, Leyton (patent indurated)	10,049	0	0
M. Kitteringham, Waltham Cross (not stated)	9,975	0	0
Wimpey & Son (2½ in. York non-slip)	9,950	0	0
W. Gibbs (Imperial)	9,934	4	4
J. Jackson, Plaistow (not stated)	9,840	7	8
Victoria Stone Co.* (patent Victoria stone)	9,698	0	0
T. Adams, Wood Green (Croft's adamant)	9,626	0	0
Myers, Gilson & Co., Hornsey ("Ceirog" flags)	9,590	11	7
Nowell & Co., Kensington (Burgess patent stone)	9,509	0	0
Indurated Stone Co. (patent indurated stone)	9,500	0	0
W. Gibbs (Croft's indurated)	9,436	3	7
Wimpey & Co. (2-in. Croft's adamant)	9,204	0	0
Griffiths & Co., London (patent Victoria, indurated)	8,932	0	0

* Accepted.

LONDON.—For providing two new iron buildings and for re-erecting one iron building to be removed from the Trafalgar Square site on to the Timbercroft Road site, Plumstead, for the London School Board. Mr. T. J. Bailey, architect:—

D. Rowell & Co.	£3,872
T. Cruwys	2,200
T. J. Hawkins & Co.	1,950
Humphreys, Ltd.	1,900
W. Harbrow	1,850
F. Smith & Co., Carpenter's Road, Stratford*	1,830

* Recommended for acceptance.

LONDON.—For sanitary and drainage works at Reddins Road School, Peckham, for the London School Board. Mr. T. J. Bailey, architect:—

Martin, Wells & Co., Ltd.	£3,024	0	0
Rice & Son	2,972	0	0
Maxwell Bros., Ltd.	2,896	3	5
W. Downs	2,697	0	0
J. & C. Bowyer	2,667	0	0
W. Johnson & Co., Ltd.	2,584	0	0
J. W. Falkner & Sons	2,577	0	0
G. Parker, 124 Sumner Road, Peckham*	2,491	0	0

* Recommended for acceptance.

LONDON.—For re-erecting iron buildings, to be removed from the Santley Street site, Brixton, on the Greening Street site, Abbey Wood, Greenwich, for the London School Board. Mr. T. J. Bailey, architect:—

T. J. Hawkins & Co.	£1,850
W. Harbrow	1,768
Mitson & Harrison	1,630
F. Smith & Co., Carpenter's Road, Stratford*	1,535

* Recommended for acceptance.

LONDON.—For hall and other improvements at Winstanley Road Infants' School, for the London School Board. Mr. T. J. Bailey' architect:—

J. Marsland & Sons	£2,978
Holloway Bros.	2,911
W. Downs	2,905
Lathey Bros.	2,837
E. P. Bulled & Co.	2,749
J. Garrett & Son	2,730
J. Carmichael	2,680
E. Triggs	2,622
Stimpson & Co.	2,600
J. & M. Patrick	2,499
F. & H. F. Higgs	2,481
W. Johnson & Co., Ltd.	2,450
W. H. Lorden & Son, Trinity Road, Upper Tooting, S.W.*	2,388

* Recommended for acceptance.

LONDON.—For re-erection of iron buildings, to be removed from the Fulham Palace Road site, on to the Mitcham Lane site, for the London School Board. Mr. T. J. Bailey, architect:—

Humphreys, Ltd.	£1,810
T. Cruwys	1,780
Mitson & Harrison	1,649
J. & W. T. Hunter	1,620
J. McManus	1,598
F. Smith & Co.	1,456
T. J. Hawkins & Co.	1,450
C. Leather & Sons, Osiers Ironworks, Wandsworth*	1,333

* Recommended for acceptance.

LONDON, E.—For new police station, Bow Road:—

		Credit.
Lascelles & Co.	£17,135	£50
Willmott Bros.	16,953	50
Patrick & Son	16,640	50
Higgs & Hill	16,640	46
Lathey Bros.	16,570	30
Holloway Bros.	16,351	50
H. J. Williams	16,287	10
Lawrance & Sons	15,981	30
Grover & Sons	15,783	40
Perry & Co.	15,500	27
Allen & Sons	15,400	—
H. Lovatt	15,275	50
T. Parker	15,192	—
Ashby & Horner	15,020	50
F. & H. F. Higgs	14,988	—

LONDON, W.—For the erection of certain additions at the polytechnic, Bedford Park, Chiswick, S.W., for the Technical Education Committee of the Middlesex County Council. Mr. H. T. Wakelam, C.E., county architect, Guildhall, Westminster, S.W.:—

Godson & Sons, Kilburn	£1,539	0	0
W. S. Beaton, Hindon Street, W.	1,497	0	0
C. Haughton & Co., Paddington	1,476	7	6
Chambers Bros., Ealing	1,427	0	0
W. Wallis, Balham	1,400	0	0
S. Polden, Woodstock Road	1,395	0	0
R. L. Tonge, Watford	1,370	0	0
Spencer, Santo & Co., Kensington	1,369	0	0
D. D. Heath, Chiswick	1,335	0	0
G. Challis, Brentford	1,309	0	0
A. Porter, Tottenham	1,299	0	0
J. W. Brooking, Richmond	1,297	0	0
W. Blackburn, Chiswick	1,289	0	0
F. W. Harris, Barnsbury	1,279	0	0
S. Ellis, Guildford	1,277	0	0
Vigor & Co., Westminster	1,275	0	0
G. Bollom, Acton	1,240	0	0
General Builders, Ltd., Notting Hill	1,197	0	0
Patman & Fotheringham,* Theobald's Road, W.C.	1,193	0	0

* Accepted.

LONGTOWN (near CARLISLE).—For the execution of waterworks, for the Longtown Rural District Council. Mr. John Little, engineer, Viaduct Chambers, Carlisle:—

J. Laing, Melbourne Street	£19,080	0	0
Jackson, Sandgate, Penrith	18,570	12	11
Henderson & Duncan, Morningside, Edinburgh	17,537	3	10
Buckley, Bingley	17,344	6	3
R. Little, Norfolk Road	16,132	19	0
McDonald & Sons, Hawick	15,871	2	0
Taylor, 12 Mason Street, Workington	15,274	11	3
Braithwaites, Swinegate, Leeds	14,832	7	5
W. & J. Lant, 10 Neville Street, Newcastle	14,543	2	3
Hudson, St. Mark's Crescent, Sunderland	13,652	10	1
Grisenthwaite & Newton, Whitehall Chambers	13,295	0	0
Millar, Annan	12,847	14	10
D. Thomson & Sons, Barwise Court	12,730	14	1
L. Kelly, St. Fillans Terrace, Edinburgh	12,595	2	1
Brebner & Co., 4 St. Andrew Square, Edinburgh	11,588	18	0
P. Drummond & Son,* Dumfries	10,317	13	0

* Accepted. [Rest of Carlisle.]

LUTON.—For the erection of residence, "The Drive," Hart Hill, for Mr. B. Lapode. Mr. A. Wilkinson, architect, Inkerman Street, Luton:—

T. & C. Neville	£1,345	G. Angel	1,120
G. W. Pryer	1,295	Mallet & Wood	1,049
G. Kingham	1,140	Alfred Mardle*	1,048

* Accepted. [All of Luton.]

RAMSEY (HUNTS.).—For new schools (mixed) and school house, for the School Board. Mr. J. G. Stallebras, architect North Street, Peterborough. Quantities by that architect:—

R. Shanks	£6,258	0	0
W. Wadel	5,779	0	0
F. B. Thackray	5,580	0	0
J. Cracknell	5.258	0	0
D. Gray	5,152	10	0
Thurley Bros.	5,145	0	0
R. J. Nichols	5,050	0	0
J. Lucas	5,050	0	0
J. Guttridge	4.005	0	0
J. Bridgefoot	4,874	10	7
Parren & Son	4,836	14	6
C. Wright	4,829	0	0
M. J. Allen	4,821	12	8
H. Watson	4,686	0	0
J. Bateman, Ramsey*	4,487	0	0
Hipwell & Co.	4,484	0	0

* Accepted.

SEDGLEY.—Accepted for the erection of house in High Street, Sedgley, for Mr. Chas. H. Price. Mr. F. B. Howarth, architect, Town Hall Chambers, Bilston, and Ellymore Road, Sedgley. B. Fullwood. Lowest of five tenders, £378, not including painting or paving.

SEVENOAKS.—For the erection of an isolation hospital at Roundabout Wood, Sevenoaks, for the Urban District Council. Mr. W. H. Ansell, A.R.I.B.A., architect, 11 Great James Street, Bedford Row, London, W.C.:—

G. H. Denne & Son, Queen Street, Deal	£6,540
Maple & Co., Ltd., London	6,399
Holliday & Greenwood, Ltd., Loughborough Park Works, Brixton	6,333
J. S. Kimberley, Banbury	6,326
R. Avard, Westborough, Maidstone	6,228
J. Lonsdale, Swanley Junction	6,037
J. J. Wise, Queen Street, Deal	5,987
R. Corben & Co., Argyle Road, Sevenoaks	5,959
W. Smith & Sons, 202 London Road, Croydon	5,928
Wiltshire & Son, Sevenoaks	5,869
Martin & Co., Barden, Tonbridge	5,855
Patman & Fotheringham, Islington	5,783
Coulson & Lofts, 37 St. Andrew's Street, Cambridge	5,717
Strange & Sons, 34 London Road, Tunbridge Wells	5,641
G. Jackson, Cheam Road, Sutton, Surrey	5,580
W. P. Banks, Dunton Green, near Sevenoaks	5,470
R. Langridge, Ham Hill, Snodland, Kent	5,353
Tapner & Co., 20 Queen's Road, Hastings	5,317
R Durtnell & Sons,* Brasted, Sevenoaks	5,275

* Accepted.

"D'Eresby House," Ealing Common.—The tender of Messrs. John Barker & Co., Ltd., for the erection of this house, was given as £26,342 on p. xii of our last issue; it should be £20,342.

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DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Jan. 2	Kinsale—Labourers' Cottages, Outoffices, Piers & Gates	Rural District Council	Engineer to Council, Workhouse, Kinsale.
„ 2	Ipswich—Alterations, &c., to Hospital Laundry	—	E. Buckham, Borough Surveyor, Town Hall, Ipswich.
„ 2	Newcastle—Methodist Sunday School	—	J. W. Taylor, 31 Westgate Road, Newcastle.
„ 3	Tamworth—Verandah, &c., at Hospital	Isolation Hospital Board	T. Bond, 22 Church Street, Tamworth.
„ 3	Branksome, Dorset—Railway Wall and Gates	Urban District Council	W. H. Curtis, Clerk, Council Offices, Branksome.
„ 3	Southwell, Notts—Additions, &c., to Brinkley Castle	H. Merryweather	Saunders & Saunders, Architects, Arcade Chambers, Newark.
„ 3	Skelmanthorpe, Yorks—Additions, &c.	—	J. Berry, 3 Market Place, Huddersfield.
„ 3	Aldershot—Erecting Corrugated Iron Building	Urban District Council	Surveyor, 126 Victoria Road, Aldershot.
„ 4	Kendal—Houses	J. Hine	J. F. Curwen, Architect, Highgate, Kendal.
„ 4	Dalkley—Twelve Working-Class Dwellings	Urban District Council	S. R. Goring, Town Hall, Dalkley.
„ 4	Leeds—Hospital Extension	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 4	Cardiff—Masonry Abutments, Retaining Walls, &c., of Bridges.	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 4	Kirkcaldy—Electric Generating Station	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 4	Athlone—Doctor's Residence, Stables and Dispensary	Union Guardians	P. J. Prendergast, Engineer, Athlone.
„ 6	Gwennap—Enlargement of Schools	School Board	S. Hill, Architect, Redruth.
„ 6	Rotherham—Fireclay, Retort, Bricks, &c.	Gas Committee	F. A. Winstanley, Engineer, Rotherham.
„ 6	Edinburgh—County Council Buildings	Midlothian County Council	A. G. G. Asher, 29 St. Andrew Square, Edinburgh.
„ 6	Wolverhampton—Insulation of Cold Stores	Markets Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„ 6	Treforest, Wales—Forty Houses	Rhydfelan Building Club	A. Ll. Thomas, Architect, Town Hall Chambers, Pontypridd.
„ 6	Ramsgate—Blinds for Hospital	Isle of Thanet Joint Hospital Board	A. B. Burrows, 72 High Street, Ramsgate.
„ 6	Wolverhampton—Branch Police Station	Watch Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„ 7	Dunfermline—Carnegie Baths and Gymnasium	—	H. J. Blanc, 25 Rutland Square, Edinburgh.
„ 7	North Burton, Bridlington—Chapel	Primitive Methodists	S. Dyer, Architect, Quay Road, Bridlington.
„ 7	Ashington, Morpeth—Isolation Hospital	Urban District Council	A. Wood, Surveyor, Market Place, Ashington.
„ 7	Holyhead—Infant School	School Board	R. E. Pritchard, Clerk, Bradford House, Holyhead.
„ 8	Exeter—Cricket Pavilion	—	E. H. Harbottle & Son, Architects, County Chambers, Exeter.
„ 8	Menai Bridge—Alterations, &c., to Hotel	Amlwch Brewery Co., Ltd.	R. G. Thomas, Architect, Menai Bridge.
„ 8	Wokingham—Alterations, &c., to Gasworks	Corporation	A. E. Sidford, Architect, Wokingham.
„ 8	Southampton—Cells and Cubicles at Police Station	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
„ 9	London, N.W.—Making Baths Watertight	Hampstead Borough Council	O. E. Winter, Borough Engineer, Town Hall, Hampstead.
„ 9	Merthyr Tydfil—Two Cottage Homes	Board of Guardians	T. Roderick, Architect, Aberdare.
„ 9	Cardiff—Car Depôt	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 11	Henley-on-Thames—Hospital Block	"Smith" Hospital Joint Committee	A. R. Lloyds, Clerk, Post Office Buildings, Henley-on-Thames.
„ 13	Cwmcelyn, near Blaina, Mon—Infants' School (200 Children).	Aberystruth School Board	R. L. Roberts, Architect, Abercarn.
„ 13	Killough, Ireland—Relaying Wood Floors	Governors of Charles Shields's Institution	G. M. Swail, Superintendent, Killough.
„ 14	Derby—Steam-Roller Sheds, &c.	Plant and Stores Committee	J. Ward, Borough Surveyor, Babington Lane, Derby.
„ 15	Plymouth—Enlargement of Head Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
„ 15	Alltwen, Wales—School	Cilybebill School Board	W. W. Williams, 63 Wind Street, Swansea.
„ 16	Barnstaple—Electricity Buildings	Town Council	A. Thorne, Borough Surveyor, Barnstaple.
„ 20	Bury—Central Tramway Depôt	Tramways Committee	A. W. Bradley, Borough Engineer, Bury.
„ 20	Brewood, Staffs—Reseating Church Nave	—	A. Weall, 84 Darlington Street, Wolverhampton.
„ 20	London, S.E.—Three Underground Conveniences	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa Road, S.E.
„ 25	Athenry, co. Galway—Five Houses	—	J. G. Skipton, Architect, Northgate Street, Athlone.
„ 27	Liverpool—Public Baths	Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool.
„ 30	Styal, Cheshire—Cottage Homes	Chorlton Union Guardians	J. B. Broadbent, 15 Cooper Street, Manchester.
No date.	New Hay, near Rochdale—Alterations, &c., to Dye Works.	—	J. Sellers & Son, Architects, Union Chambers, Bury.
„	Manchester—Bank	—	J. Horsfall, 4 Chapel Walks, Manchester.
„	Northawton—Farm Residence, &c.	W. Madge	E. F. Hooper, 6 Union Road, Pennsylvania, Exeter.
	ENGINEERING:		
Jan. 2	Nantwich—Waterworks	Rural District Council	J. A. Davenport, 152 Hospital Street, Nantwich.
„ 2	Windsor—Cast-iron Dam	Waterworks Committee	C. Sainty, Waterworks Engineer, Tangier Lane, Eton.
„ 3	Bakewell—Water Scheme	Rural District Council	Sterling & Swann, Engineers, Town Hall, Chapel-en-le-Frith.
„ 4	Cardiff—Widening and Reconstructing Bridges	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 4	Warrington—Electric Lighting Station, &c.	Corporation	Preece & Cardew, 8 Queen Anne's Gate, Westminster, S.W.
„ 6	Lifford, near King's Norton—Refuse-Destructor	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
„ 6	Nantwich, Cheshire—Electric Plant	Urban District Council	Under-Secretary for Public Works, Sydney.
„ 6	Rochford, Essex—Pumping Machinery	Rural District Council	J. Mansergh, 5 Victoria Street, Westminster.
„ 6	Bournemouth—Electric Cables, &c.	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
„ 6	Bratton Fleming, Devon—Tunnel	Ilfracombe Urban District Council	Surveyor, Town Hall, Ilfracombe.
„ 6	Ilfracombe—Tunnel	Urban District Council	Surveyor, Town Hall, Ilfracombe.
„ 7	London, N.W.—Steam Road-Roller	Willesden District Council	O. C. Robson, Engineer to Council, Public Offices, Dyne Road, Kilburn, N.W.
„ 7	Tynemouth—Gravitation Main	Corporation	J. Mansergh, 5 Victoria Street, Westminster.
„ 7	Manchester—Laying Waterpipes from Thirlmere to Manchester.	Corporation	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
„ 8	Christiania—120 Ammunition Wagons	Norwegian Government	Artilleriets Vœrksteder, Fœstninger, Christiania.
„ 8	Bromsgrove, Worcs—Sinking for Water Supply	Asylum Committee of Visitors	R. O. Seacome, Clerk to the Committee, Shire Hall, Worcester.
„ 8	Ponteland, near Newcastle—Railway	North Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-upon-Tyne.
„ 8	Shepton Mallet, Somerset—Waterworks	Rural District Council	W. Phelps, Engineer, Council Offices, Market Pl., Shepton Mallet.
„ 8	Kirkcaldy—Steam Pipes, Pumps, &c.	Corporation	Kennedy & Jenkin, 17 Victoria Street, Westminster, S.W.
„ 8	Bromsgrove, Worcs—Sinking for Water Supply	Asylum Committee of Visitors	R. O. Seacombe, Clerk, Shire Hall, Worcester.
„ 8	Ashton-in-Makerfield—Steam Road Roller, Scarifier and Sludge Remover.	Urban District Council	J. W. Liversedge, Surveyor, Council Offices, Ashton-in-Makerfield.
„ 10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	G. H. Hill & Sons, 3 Victoria Street, Westminster.
„ 10	Winchburgh, Scotland—Waterworks	Linlithgow District Committee	W. A. Tait, 72A George Street, Edinburgh.
„ 11	Glasgow—Tramways	Corporation	J. Young, 88, Renfield Street, Glasgow.
„ 14	West Ham—Condensing Plant and Crane	Town Council	Borough Electrical Engineer, Abbey Mills, West Ham, E.
„ 14	London, E.C.—Railway Rolling Stock, Bridgework, &c.	South Indian Railway Co., Ltd.	Sir George B. Bruce, 3 Victoria Street, Westminster.
„ 14	Armagh, Ireland—Wells	Rural District Council	W. Calvert, Clerk, Workhouse, Armagh.
„ 15	London, N.—Electrical Plant	Hornsey Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 16	Barnstaple—Electrical Plant	Town Council	W. H. Trentham, 39, Victoria Street, Westminster, S.W.
„ 17	West Bromwich—Electric Tramways	Town Council	A. D. Greatorex, Borough Engineer, Town Hall, West Bromwich.
„ 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
„ 18	Newcastle-on-Tyne—Four Hopper Barges	Tyne Improvement Commissioners	R. Unwin, Secretary, Berwick Street, Newcastle-on-Tyne.
„ 21	Manchester—Electric Switchboards	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
„ 21	Middlesbrough—Electric Lighting Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 24	Barking, Essex—Electrical Generating Plant	Urban District Council	Engineer, Electricity Works, East Street, Barking.
„ 27	Madrid—Electric Tramway Concession	Spanish Ministry of Public Works	Commercial Department, Foreign Office, S.W.
„ 31	Johannesburg—Carburetted Water and Gas Plant	—	Crown Agents for the Colonies, Downing Street, London.
„ 31	Paignton—Waterworks	Urban District Council	F. W. Vanistone, Engineer, Palace Chambers, Paignton.
Feb. 5	Calcutta—Waste-water Meters	Corporation	F. Gainsford, Secretary to Corporation, Calcutta.
„ 17	London, E.C.—Widening London Bridge	Corporation	City Surveyor, Guildhall, E.C.
„ 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
Mar. 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
	IRON AND STEEL:		
Jan. 3	Branksome, Dorset—Wrought-iron Railing and Gates	Urban District Council	W. H. Curtis, Clerk, Council Offices, Branksome.
„ 4	Leeds—Smith and Ironfounder Work at Hospital	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 4	Halifax—Castings, Ironmongery, &c.	Waterworks Committee	J. A. Paskin, 22 George Street, Halifax.
„ 6	Edinburgh—Iron and Steel Work to Buildings	Midlothian County Council	A. G. G. Asher, 29 St. Andrew Square, Edinburgh.
„ 7	Sheffield—Ironmongery, Castings, &c.	Tramways Committee	A. L. C. Fell, General Manager, Tramways Department, Town Hall, Sheffield.
„ 7	Greenwich—Guttering for Stables	Borough Council	Borough Engineer, Town Hall, Greenwich.
„ 8	Christiania—Railway Points	Norwegian State Railways	Commercial Department, Foreign Office, S.W.
„ 8	High Wycombe—Manhole Covers, &c.	Corporation	T. J. Rushbrooke, Borough Surveyor, High Wycombe.
„ 13	Burnham, Somerset—Iron and Steel Substructures	Urban District Council	W. J. Press, Council's Surveyor, Burnham.
„ 14	London, E.C.—Bridge Works, Railway Stores, &c.	South Indian Railway Co., Ltd.	Sir George B. Bruce, 3 Victoria Street, Westminster.
„ 28	London, S.W.—Tramway Rails	London County Council	Clerk, County Hall, Spring Gardens, S.W.
„ 30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	PAINTING AND PLUMBING:		
Jan. 4	Leeds—Plumber and Painter Work at Hospital ..	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 4	Halifax—Oils and Paints, Leads, &c.	Waterworks Committee	J. A. Paskin, 22 George St., Halifax.
„ 6	Edinburgh—Plumbers' Works at County Council Blgs.	Midlothian County Council	A. G. G. Asher, 29 St. Andrew's Square, Edinburgh.
„ 7	Sheffield—Oil, Paints, Brushes, &c.	Tramways Committee	A. L. C. Fell, Tramways Department, Town Hall, Sheffield.
„ 7	Blackburn—Painting and Decorating Church	——	S. J. Tucker, 79 London Road, Blackburn.
„ 10	Halifax—Painting, Colouring, &c., at Town Hall ..	Finance Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
	ROADS AND CARTAGE:		
Jan. 4	Horsham, Sussex—Materials	West Sussex Roads & Bridges Committee	W. B. Purser, 4 Worthing Road, Horsham.
„ 4	Wolverhampton—Street Works	Streets Committee	G. Green, Borough Engineer, Town Hall, Wolverhampton.
„ 4	Carrickfergus—Granolithic Footpath	Urban District Council	J. Boyd, Town Clerk, Town Hall, Carrickfergus.
„ 4	Whitley, Northumberland—Street Works	Urban District Council	J. P. Spencer, 30 Howard Street, North Shields.
„ 4	Dalkley—Concreting and Kerbing Footpaths	Urban District Council	S. R. Going, Engineer, Town Hall, Dalkley.
„ 4	Accrington—Street Works	General Works Committee	W. J. Newton, Borough Engineer, Town Hall, Accrington.
„ 6	Cheam, Surrey—Laying-Out Burial Ground	Paddington Parish Council	J. D. Searles-Wood, 157 Wool Exchange, Coleman Street, E.C.
„ 6	London, N.—Tar Paving	Edmonton Urban District Council ..	G. E. Eachus, Town Hall, Lower Edmonton.
„ 7	North Shields—Rubble Foundation and Paving ..	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, North Shields.
„ 7	Market Harborough—Cattle Market	Urban District Council	Coales & Johnson, Bank Chambers, Market Harborough.
„ 7	Croydon—Road Repair	Town Council	Borough Road Surveyor, Town Hall, Croydon.
„ 7	Mountain Ash, Wales—Street Improvements	Urban District Council	Surveyor, Town Hall, Mountain Ash.
„ 7	Soothill Nether, Yorks—Flags	District Council	W. Scholefield, jun., Clerk, Wellington Road, Dewsbury.
„ 7	Southampton—Pipe Sewer	Corporation	Borough Engineer, Municipal Offices, Southampton.
„ 8	Kingston-upon-Thames—Materials	Corporation	Borough Surveyor, Clattern House, Kingston-upon-Thames.
„ 8	Twickenham—Street Works	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
„ 9	Castleford, Yorks—Improvement Works	Urban District Council	W. Green, Surveyor, Castleford, Yorks.
„ 11	London, S.W.—Vans, Trucks, Street-Sweeping Machines, &c.	Westminster City Council	J. W. Bradley, City Engineer, Town Hall, Westminster.
„ 13	Bournemouth—Tip-Carts, Water Vans, &c.	Town Council	F. W. Lacey, Borough Engineer, Bournemouth.
„ 13	London, E.—Materials	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
„ 14	London, N.—Street Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
	SANITARY;		
Jan. 2	Cork—Sewers, &c.	Board of Guardians	J. Cotter, Clerk, Guardians' Offices, Cork.
„ 3	Castlebar—Two Automatic Earth-closets	Union Guardians	T. M. Quinn, Clerk, Workhouse, Castlebar.
„ 3	Marlborough, Wilts—Sewerage Works	Town Council	Fairbank & Son, 13 Lendal, Yorks.
„ 4	Londonderry—Drainage Works at Hospital	Guardians	M. A. Robinson, Architect, Richmond Street, Londonderry.
„ 6	Lifford, near King's Norton—Refuse-Destructor ..	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, near Birmingham.
„ 8	Uxbridge—Scavenging	Rural District Council	C. Woodbridge, 38 High Street, Uxbridge.
„ 9	London, N.W.—Main Drain to Baths	Hampstead Borough Council	C. E. Winter, Borough Engineer, Town Hall, Hampstead.
„ 11	Swinton, Manchester—Sewer	Urban District Council	Surveyor, Council Offices, Swinton.
„ 13	Maidstone—Disinfectants	Urban District Council	Sanitary Inspector, Maidstone.
	TIMBER:		
Jan. 2	Kinsale, Ireland—Fencing	Rural District Council	J. Murphy, Clerk, Boardroom, Workhouse, Kinsale.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 11	Lowestoft—Yacht Club House (to cost £4,200) ..	£25, £20, £15.	H. T. Clarkson, Secretary, Royal Norfolk and Suffolk Yacht Club, Lowestoft.
„ 13	Ennis—Architect to be appointed for Additions to Lunatic Asylum.	——	J. Enright, Clerk of the Asylum, Ennis.
„ 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 15	Kirkcaldy—Elementary School (400 pupils)	——	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 20	Dublin—Water Supply and Drainage Scheme	£50.	J. O'Neill, Clerk to North Dublin R.D.C., Boardroom, North Brunswick Street, Dublin.
„ 31	Bangor—Infants' School [Local Architects Only] ..	——	A. O. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
„ 31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
„ 31	Hull—Art School (cost not to exceed £10,000) ..	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
„ 31	Newport, Isle of Wight—Queen Victoria Memorial ..	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
„ 4	Mountain Ash, Wales—Municipal Offices	£75.	J. Williams, Surveyor to U.D.C., Town Hall, Mountain Ash.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1–14	St. Petersburg—Bridges over Great Neva River ..	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Gateshead—Board School [Local Architects Only] ..	——	E. J. Harding, Clerk to School Board, Gateshead.

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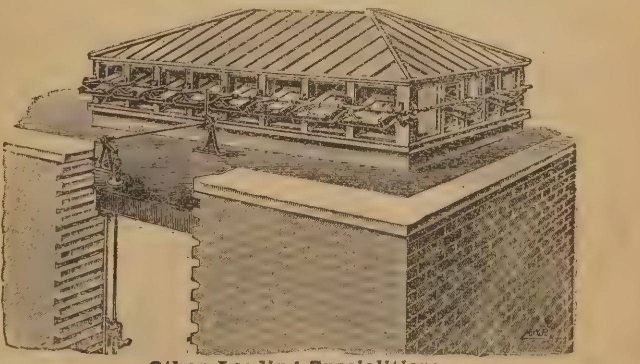

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Barnett & Sons, Ltd.

Registered to acquire the business carried on by S. Barnett, as S. Barnett & Sons, at the Rattlechain and New Stour Valley Brickworks, Dudley Port, Rowley Regis, brick and tile manufacturers. Capital £20,000 in £1 shares. The first directors are S. Barnett (chairman), W. Barnett and J. Barnett. Registered office: Tividale, near Dudley Port, Rowley Regis, Staffordshire.

M. H. Blanchard & Co., Ltd.

Registered to acquire the business of terra-cotta, brick, tile and earthenware pipe manufacturer, lime burner and merchant, now carried on at Bishop's Waltham, in the county of Southampton, by M. H. Blanchard, as M. H. Blanchard & Co.; and to carry on the business of builders, contractors, dealers in building materials, &c. Capital £20,000 in £1 shares. The first directors are M. H. Blanchard, A. H. Bone and W. Cowley. Registered Office: Bishop's Waltham, Hants.

Drew-Bear, Perks & Co., Ltd.

Registered to enter into an agreement with T. Drew-Bear, E. H. Perks and A. J. Greig for the acquisition of the business of Drew-Bear, Perks & Co., and to carry on the business of ironfounders, mechanical engineers, tool makers, brassfounders, metal workers, &c. Capital £100,000 in £5 shares (9,800 preferred). The first directors are T. Drew-Bear (chairman and managing director), E. H. Perks and A. I. Greig. Registered office: 71A, Queen Victoria Street, E.C.

Keystone Incandescent Co., Ltd.

Registered with a capital of £100,000 in £1 shares.

Kinnaird Park Estate Co., Ltd.

Registered to acquire all or part of the Kinnaird Park Estate, Bromley, Kent, and to carry on the business of land and property owners and dealers, builders, contractors, farmers, graziers, &c. Capital £40,000 in £10 shares. The first directors are G. Loby, C. Savage, W. G. Allen, H. G. Norris, E. T. D. Wilson and W. Prebble (managing director). Registered office: 4, Walbrook, E.C.

Robertsbridge Brick Co., Ltd.

Registered to carry on the business of brick, tile, pipe, pottery, earthenware, terra-cotta, china and ceramic-ware manufacturers, paviors, dealers in artificial stone, &c. Capital £1,000 in £1 shares. Registered office: Messrs. Murgess & Co.'s corn stores, Robertsbridge, Sussex.

Smith & Pearson, Ltd.

Registered for the purpose of acquiring the goodwill of the Irish business of iron fence, gate and railing manufacturers, now carried on by Messrs. Henry Smith & Joseph H. Smith, under the style of Hill & Smith, at 47, Dawson Street, Dublin. Capital £8,000, divided into 8,000 £1 shares. The first directors are Messrs. John B. Pearson, Joseph Henry Smith, and Charles Frederic Allen. Registered office: 47, Dawson Street, Dublin.

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Victoria Mansions, Ltd.

Registered to adopt an agreement with C. H Wilson, M.P., and to provide, furnish, equip and control lodging-houses, &c. Capital £30,000 in £10 shares.

Wigan Estates Co., Ltd.

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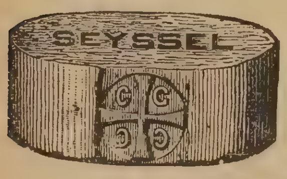

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COMING EVENTS.

Wednesday, January 1.

SOCIETY OF ARTS.—Sir Henry Trueman Wood on "Photography and its Applications"—I., 5 p.m.

Thursday, January 2.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. A. S. E. Ackermann, A.M.I.C.E., on "Engineering Observations in 1901 in the United States of America," 8 p.m.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—III., 3 p.m.

Friday, January 3.

ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century," 7.30 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. John Buley on "The Uses of Exhaust Steam," 8 p.m.

Saturday, January 4.

SANITARY INSPECTORS' ASSOCIATION (Carpenters' Hall, E.C.).—President's New Year Address, 6 p.m.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—IV., 3 p.m.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall, E.C., at 6 p.m.

Monday, January 6.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Dr. A. S. Murray on "Two Ionic Capitals in the British Museum," 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. James Parkinson on "Old English Cottages."

BIRMINGHAM AND DISTRICT CLERKS OF WORKS AND BUILDERS' FOREMEN'S ASSOCIATION.—Mr. J. Jackson on "Practical Hints on Hot-Water Fitting," 8 p.m.

Tuesday, January 7.

MANCHESTER SOCIETY OF ARCHITECTS (Students' Meeting).—Mr. H. B. Laycock on "Vaulting."

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. P. J. Lynch on "Early Christian Architecture in Ireland," 7.45 p.m.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY (Association Section).—Paper by Mr. J. H. Phillips, 8 p.m.

ROYAL INSTITUTION.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—V., 3 p.m.

Wednesday, January 8.

SOCIETY OF ARTS.—Sir Henry Trueman Wood on Photography and its Applications"—II., 5 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

Thursday, January 9.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. J. D. Crace on "Relation of Colour to Architecture."

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m. Ballot for Election of Fellows.

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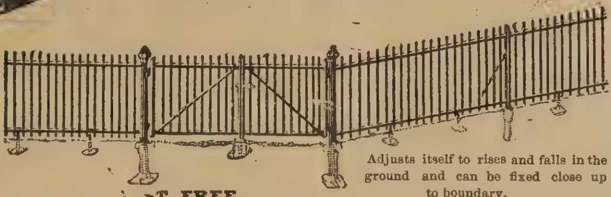

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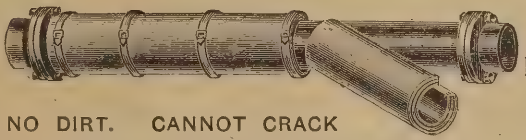

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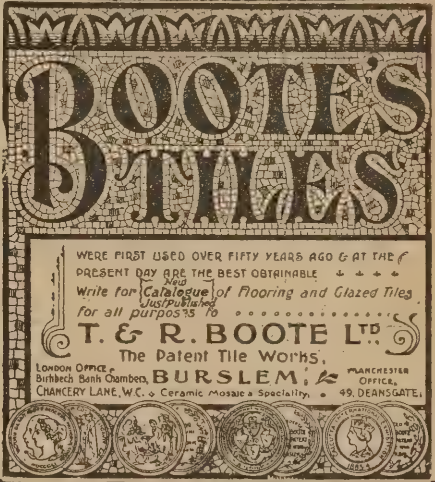

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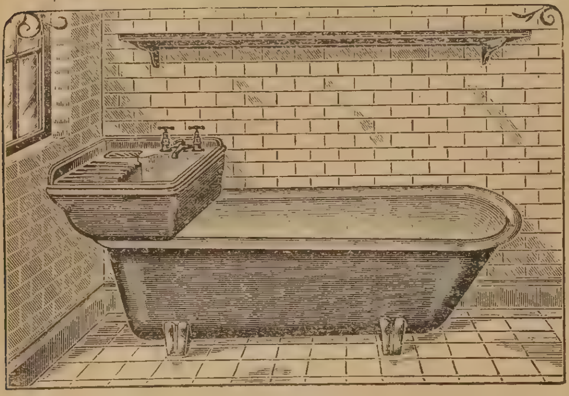

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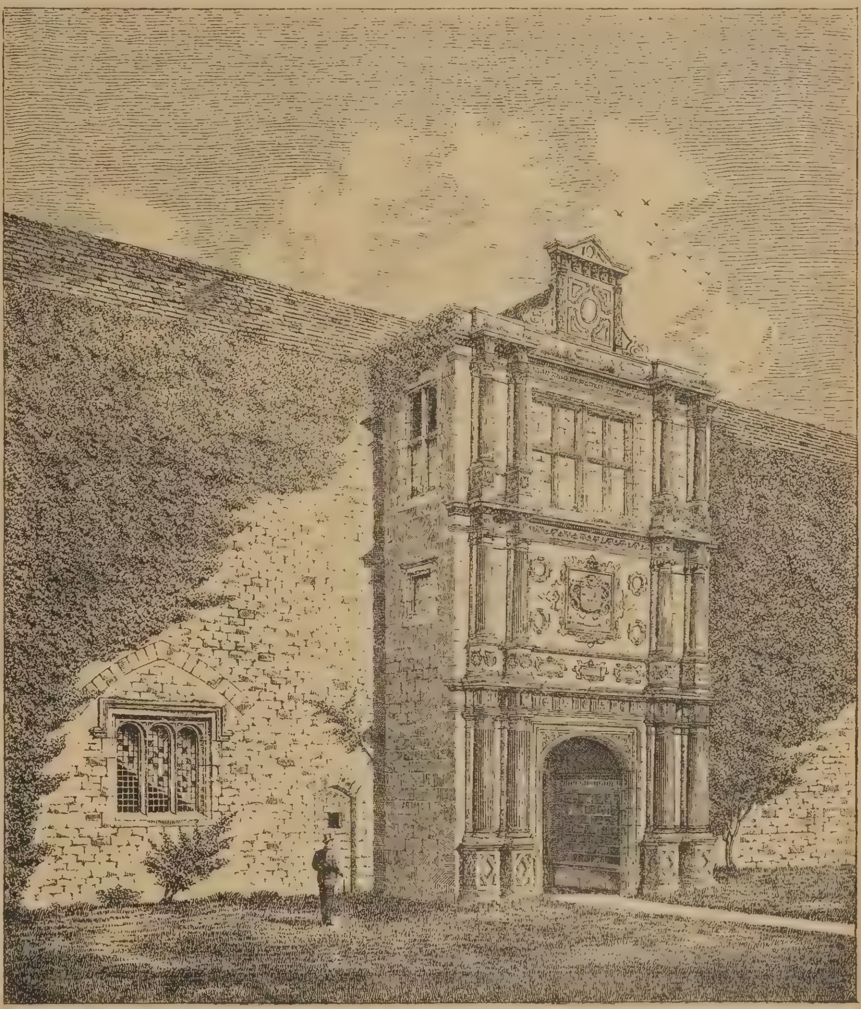
An Architectural Causerie.

Music and Architecture. SUCH a title as this suggests an abstruse dissertation epitomized in the statement that architecture is "frozen music," or, as Goethe would have it, "speechless music." But our purpose is much more practical, since it has reference to the annual conference of the Incorporated Society of Musicians held last week at the Hotel Cecil, and more especially in regard to Dr. Harding's remarks on the effect of musical examinations. This subject furnishes an interesting sidelight on architectural registration. Dr. Harding's contention was that examinations, kept within bounds, were of inestimable benefit, though some had accused them of cramping and stunting the minds and talents of would-be composers. But a real genius would never conform to any set procedure in his studies. No examinations could make or mar a genius, but they could and did materially help to make cultured musicians. If the higher examinations prevented people from composing who had nothing to compose, they should be hailed with delight, for it was generally thought (except by music publishers) that there were too many composers in the present day.—The parallel of architecture will be obvious, though restricted. Music and architecture are produced under such different conditions that they cannot be compared from a single standpoint; and yet there are certain phases of both arts which are analogous. No amount of teaching, however excellent, will make a man a musician if he has not got music in his soul to begin with—an obvious fact, yet one unfortunately unobserved by myriads; and moreover, on the other hand, it is quite possible for a man to be able to compose extempore the most exquisite music and, at the same time, be totally ignorant of the laws of harmony or the theory of counterpoint. Handel and Beethoven might, among many others, be given as instances of the latter fact, but it must be remembered that before they can transcribe their music on to paper they must learn the various theories upon which the notation is based. In the same way, examinations will not make an architect, but they can test the knowledge of construction which he *must* possess to enable him to design, for construction must be the basis of design. Here music and architecture differ. The former deals only with sensuous pleasure, the latter with solid realities. Music affects the ear alone; architecture the eye *and* the intelligence. But in both it is essential to be perfectly familiar with the laws that govern them, the relation of part to part and to the whole; and consequently it is weakness to avoid a test of such knowledge. Every rule has its exception, and maybe genius is exempt from examination; but genius only occurs once in a while; and, with regard to the main body of architects, it is better for the common weal that they should plainly exhibit a thorough knowledge of the use of materials rather than, for fear of shackling the genius, they should be allowed to do as they please.

A Carnegie Library. BY continually exposing every instance of the abuse of competitions, it may be hoped that some good will be effected. Mr. C. H. Reilly draws attention to the most recent. It concerns the first public library to be built under the scheme which Mr. Carnegie's generosity has initiated—that of the small town of Hawick. It appears that the local authorities, having received a grant of £7,000, decided to hold a public competition for the design of the library, and Mr. James Burnet, the well-known president of the Glasgow Institute of Architects, was appointed assessor. Of the designs submitted he chose two, but the Town Council entirely disregarded his decision and, following their own judgment, selected a design by a relative of the town chamberlain. As Mr. Reilly most properly points out, such a barefaced example of nepotism should not be allowed to escape public notice, especially as it concerns a gift which is characterised by its liberality.



ENTRANCE PORCH, OLD BEAUPRÉ, GLAMORGANSHIRE. DRAWN BY W. EATON, A.R.I.B.A.

Entrance Porch, Beaupré, Glamorganshire. BEAUPRÉ MANOR-HOUSE is situated on a beautiful and well-wooded site near the village of Cowbridge, about twelve miles from Cardiff. Originally it was the seat of the Cecil family, who built the greater portion of it, but for many centuries it has been in the possession of the Bassetts. Most of the buildings are in ruins, and the roofs in many instances have fallen in, but the entrance porch is in a very good state of preservation and is well cared for by a farmer who occupies several rooms. The greater portion of the work appears to have been erected about 1586, which is the date on a panel over the entrance doorway to the courtyard, but the Renaissance porch was built later, as stated by the following inscription over its doorway:—Say: Cowldst thov ever fynd or ever heare or see worldly wretche or coward prove a faythfvll frynde to bee. Ry. Charde Bassett, having to wyfe Katherine dovghter to Sir Thomas Johns Knight bwylt this porch with the towers in Ano 1600. His yeres 65. His wife 55.—Gwilt in his encyclopædia, speaking of the style of architecture practised during the reigns of James I. to Anne, says: "The use of the Orders became general. In Glamorganshire at Beaupré Castle (1600), which has a front and porch of the Doric order, we find a composition including that just named the Ionic and the Corinthian wherein the capitals and columns are accurately designed." The accompanying drawing is by Mr. W. Eaton, A.R.I.B.A.

Der Architekt Wilhelm. THE versatile Kaiser fully justifies the title of William the Wonderful. Ruler, soldier, poet, painter, musician, and now—architect. It appears that the authorities at Wiesbaden were erecting new central police offices, the plans for which, after long delay, had been passed by the Minister of the Interior. The foundations were being rapidly completed, when, lo! an order came to stop everything. Four months later operations were resumed, and it now transpires that the reason of this interruption was that the Kaiser had seen the proposed plans, had perceived their imperfections, and had ordered new plans to be made from his own designs! What a splendid P.R.I.B.A. he would make!

LITTLE MORETON HALL.

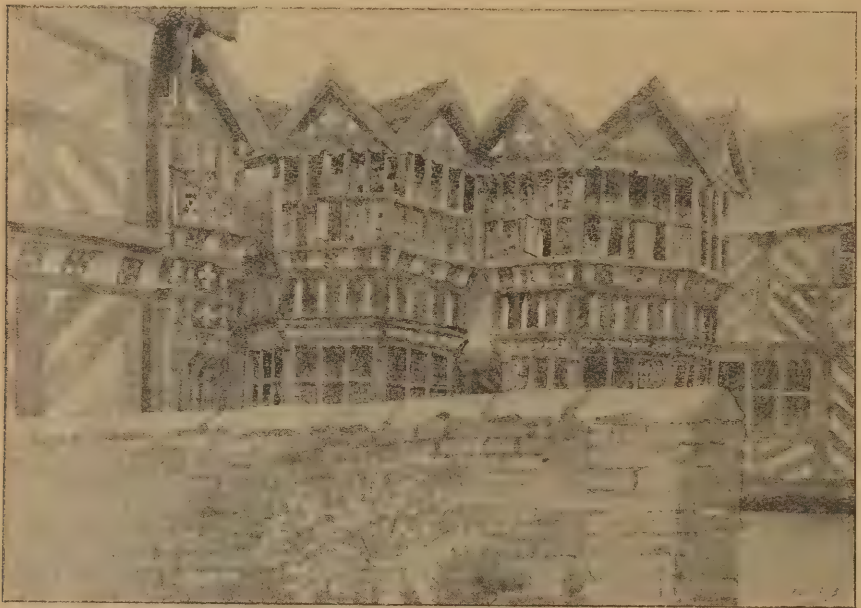
By J. HUTCHINGS, A.R.I.B.A.

ALTHOUGH timber architecture is common in numerous districts of England, the wooden halls of Cheshire and Lancashire belong to a particular school, or at least possess local peculiarities that differentiate them from similar work in other parts of the country.

Examples of the smaller type of house, dating from the sixteenth century downwards, are dotted plentifully over this locality, and exceedingly picturesque and interesting they are. Halls on a larger scale, constructed on the courtyard principle, are naturally far less numerous, and on that account their claims to our interest and study are the greater.

Moreton, though far from the largest in scale, is nevertheless one of the most perfect surviving specimens of the latter class. Situated in Cheshire, near the north-west border of Staffordshire and close to the eminence of Mow Cop, this ancient seat of the Moretons stands in a beautifully wooded portion of the Cheshire plain—even to-day ancestral in its aspect, patrician in its exclusiveness, and still isolated by its moat.

The high road from the North Staffordshire Potteries to Congleton, Macclesfield, and the great manufacturing cities of Lancashire, passes within 200yds. of it, whence comes the stream of sightseers by brake and "bike"; for Moreton, though partly inhabited, is now a great showplace, whose fame is well known in its own and the neighbouring counties.



VIEW IN COURTYARD, ILLUSTRATING SKYLINE.

The hall consists of a number of apartments grouped round a courtyard, completely enclosed except for a gap in the middle of the west side, which affords access to the large kitchen garden, the whole area being surrounded by a moat.

As the buildings are constructed of timber with plaster or brick filling, Moreton could never have been regarded as a fortress, nor, indeed, was there any necessity that it should serve such a purpose in the sixteenth century, to which period the greater portion belongs; and the moat—a survival of some older domicile—must have been retained as an ornamental feature, and possibly as a protection from sudden attack either on the part of a rival landholder or of a band of marauders—no unlikely contingency in those unsettled times. A drawbridge originally occupied the position of the present stone arch, which could be operated at will from the gatehouse by the entrance.

The surrounding dyke would give the dwelling an air of security; and we may be sure that if not raised every night the bridge would be drawn during periods of political unrest and in the absence of the lord of the manor.

The farm buildings stand in an independent enclosure adjoining and without the moat, but these appear of considerably later date than the older portions of the principal structure.

The front range consists of three storeys, the uppermost being the ballroom, a long narrow apartment flanked with a continuous row of windows on each side. This second floor is of considerably less width than the storey below, and presents externally much the same appearance as the clearstory of a church, with the abutting side-aisle roofs. This wing is an imposing architectural conception, well balanced, exellently grouped, beautiful in colour, and direct in construction, but somewhat wanting in simplicity owing to the excessive use of ornament in the panels formed by the main beams.

Within the courtyard fancifulness, picturesqueness and playfulness reign supreme, but combined with an all-pervading air of natural homeliness, such a charming piquant freshness and spontaneity of design, entirely free from the vulgarities perpetrated by the later Jacobean school, that instead of criticizing in a carping utilitarian spirit, the spectator—if, indeed, he possess any leaven of imagination or romance—abandons himself unreservedly to the intoxication of the moment, and drinks in with unchecked delight the remarkable scene that meets his vision; thankfully acknowledging the homely humour and high poetic fervour that endowed the work of the old builders with so much human interest and character. He is at one with these ancient craftsmen, though separated by centuries, and instantly realizes that they were creatures of flesh and blood like himself, endowed with the same emotions, the same love of colour and form, and revelled in quaint tricks and innocent games. They speak to him in many a combination and arrangement of the customs of long ago; they reveal a sturdy common-sense in their solid practical construction; they do not trick him with false veneer, but in absolute fidelity expose mortice and tenon, joint and pin. The materials are the very best that the neighbourhood could furnish—English oak, plaster that has withstood the weather for hundreds of years, and stone roof slabs that promise to outlast the rest of the fabric. And the whole bears evidence of the expenditure of their most utmost skill in resource; and still the carvings whisper fragments of hoary legends; they animate every corner with quaint devices and grotesque suggestions. The hand of the workman appears to have lingered lovingly over every detail, and even Time seems to have dealt in a more relenting mood with this venerable structure than is his wont, hesitating to hurl into formless ruin this beautiful creation, that his own finger has enhanced and adorned.

The entrance porch to the hall and the two large bay windows were added by William Moreton, as the legend carved on the lintels testifies. It reads as follows:—

GOD IS ALL IN ALL THING
THIS WINDOW WHIRE MADE BY WILLIAM
MORETON IN THE YEARE OF OURE LORD MDLIX.
RYCHARDE DALE, CARPEDER, MADE THIES
WINDOWS BY THE GRACE OF GOD.

Richard Dale must have been a craftsman of an extremely high order, judging from the admirable proportions and elegant details of his work. Set upon a basement of stone rising a foot from the ground, the upper storeys of the bays are coved out beyond the lower windows, and the many-gabled roofs are brought still further forward and embellished with barge-boards, enriched beams and carved pendants; the whole having that quaint appearance of top-heaviness so characteristic of old-timber architecture, and which appears so pronounced in the narrow thoroughfares of our older towns. The entrance door has an arched Tudor head, and is flanked with cable pilasters, supporting curious brackets, ornamented with sunk panels and cusps of Gothic design. Above the door are two bands of pilasters, the interstices being filled with painted quatrefoils; above those separated by a plaster cove, also diapered with painted ornament, is a many-mullioned window, the whole surmounted by a gable and projecting barge-board.

This work by Dale, which was added to an older structure, forms a fine composition; it is the most interesting portion of the building, and our respect for the craftsmen of the time must be considerable when we find in an obscure corner of Cheshire a master-carpenter of his knowledge, dexterity and good taste.

The remainder of the courtyard is worthy of study, though treated with greater severity than Dale's addition; but the same fanciful element prevails throughout in a lesser degree, and no portion can be pronounced dull or insipid.

The banqueting hall, occupying the side opposite the main entrance, is a fine apartment, open to the roof, 38ft. long by 28ft. wide. It is partially lighted by one of Richard Dale's bay windows, and the fireplace, reduced in size and shorn of its adornments, is in the wall opposite, whilst the space under the beam in days gone by would be enclosed by a screen to form a disconnecting corridor between the hall on one side and the kitchen and offices on the other. Above was the minstrels' gallery, no longer open at the front, but blocked up with a partition to provide private access to the bedrooms over the kitchen wing. The windows are glazed with leaded glass of good geometrical design, and contain some fragments of stained work, including, among other insignia, a greyhound statant, the crest of the Moreton family. The oak wainscotting was probably added at the time that the bay windows were erected, namely, in 1559. The grand old oak table is a first-rate piece of workmanship, admirably designed and constructed, combining every appearance of strength and durability with elegance of form and propriety of detail.

The lord's parlour and withdrawing-room adjoin the upper, or daïs, end of the hall.

The withdrawing-room is of stately proportions, having a bold ceiling divided into rectilinear compartments by massive beams, deeply moulded. The walls are wainscotted from floor to ceiling, and the heaviness of the ceiling appears in striking contrast to the delicate panelling upon which it appears to rest. Probably the explanation is that the latter also was added by Dale. The original fireplace has been superseded by a tame Georgian design, but the overmantel remains intact and contains the arms of Queen Elizabeth framed by the grotesque pilasters and mouldings of the period.

The lord's private chamber has also been delivered over to the Georgian improver, who is responsible for the sash windows which replace the older mullioned lights.

The kitchen, now opening directly from the hall, is of ample dimensions (in harmony with the hospitable practices of the period), and is provided with an enormous fireplace 11ft. wide. There remains a round table of rude but massive construction, and also a fine oak dresser, equipped with several old pewter vessels bearing the Moreton crest.

The buttery, but little inferior in size to the kitchen, adjoins the latter, and bespeaks a capacity not likely to have been overtaxed even in that age of mighty trenchermen.

The eastern wing contains, besides the curious little chapel with the priest's lodging above, some stable buildings with a suite of bedrooms on the upper storey. The chapel is so extremely small that it must have been intended for private devotions, and probably for occasional Sunday worship when local disorders rendered a journey to the parish church of Astbury unsafe, or during inclement weather, when the badly-tended roads would be practically impassable. A writer thus humorously comments upon this diminutive place of worship: "The ancient sanctuary is of small dimensions, about 12ft. by 9ft., from which it may be assumed that the Moretons, if they required a considerable amount of space for their temporal concerns, were able to manage their spiritual affairs within very moderate limits."

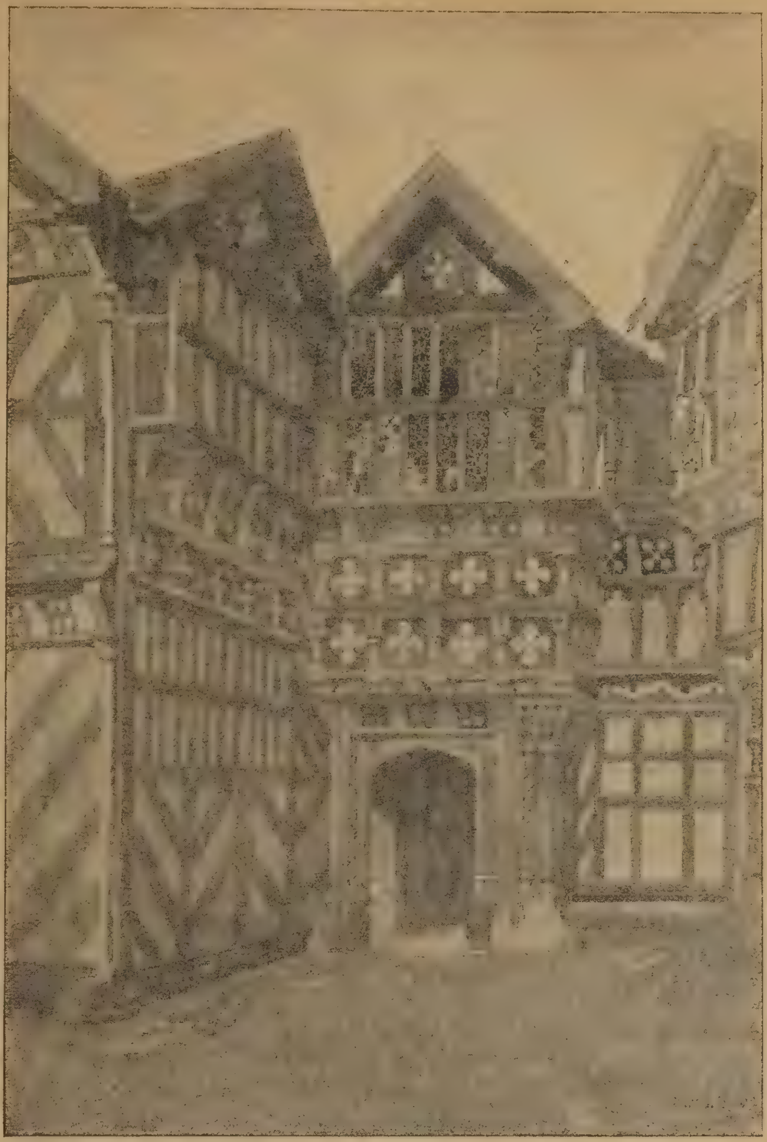
The front range comprises the gateway and a number of stable buildings on the ground floor. The state apartments, containing the garde robes, which empty into the moat—such was the elementary state of sanitary science at the time—occupy the first floor. And in connection with this suite are two secret hiding-places situated in the west wing, and communicating with one of these was a subterranean passage leading beyond the moat.

The top storey is entirely devoted to the ballroom, with the exception of the small retiring room in the gabled projection in the centre of the front.

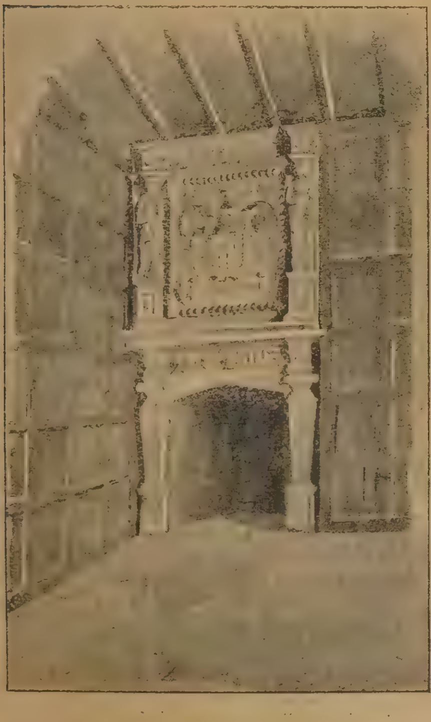
The ballroom is in the form of a gallery 75ft. by 12ft. 6in. wide, lighted on both sides, and now at one end only, the other gable window having been blocked up. The walls are panelled, and the open-timber roof is of good design, embellished with ornamental cross-bracing between the principals and purlins. These proportions, though perfectly adapted to the old-fashioned dances of the Sir Roger de Coverley type, would ill respond to the exigencies of the modern waltz and polka.

There is little documentary history of Moreton, beyond a list of names and matrimonial alliances; but the old walls tell their own tale eloquently enough, and it is evident that the range containing the hall and kitchen existed prior to the middle of the sixteenth century, when William Moreton employed Dale to reconstruct the elevation to the courtyard.

The chapel bears unmistakable evidence of greater antiquity, the ceiling beams having been shaped by an adze, and other details are of the same rude workmanship. The front range was probably erected shortly after the completion of the 1559 additions.



LITTLE MORETON HALL: ENTRANCE.



FIREPLACE IN RETIRING-ROOM ADJOINING BALLROOM.

It therefore appears that the original dwelling consisted of the hall, with the kitchen wing at one end and the withdrawing-room and lord's parlour at the other, the sleeping apartments being above the two wings. The chapel was either a separate building, or was connected with the main block by stables. This was the common plan of an English castle or manor, handed down from remote times; and this group of chambers always formed the nucleus of the more magnificent establishments. The sumptuous state apartments and ballroom would be added either as an outlet for increased wealth or to meet the increasing luxury of the times.

As was usual at the period, each room, with one or two exceptions, occupies the full width of a range, and the chambers are planned opening one out of another, instead of communicating with a landing or corridor, as demanded by the requirements of modern manners.

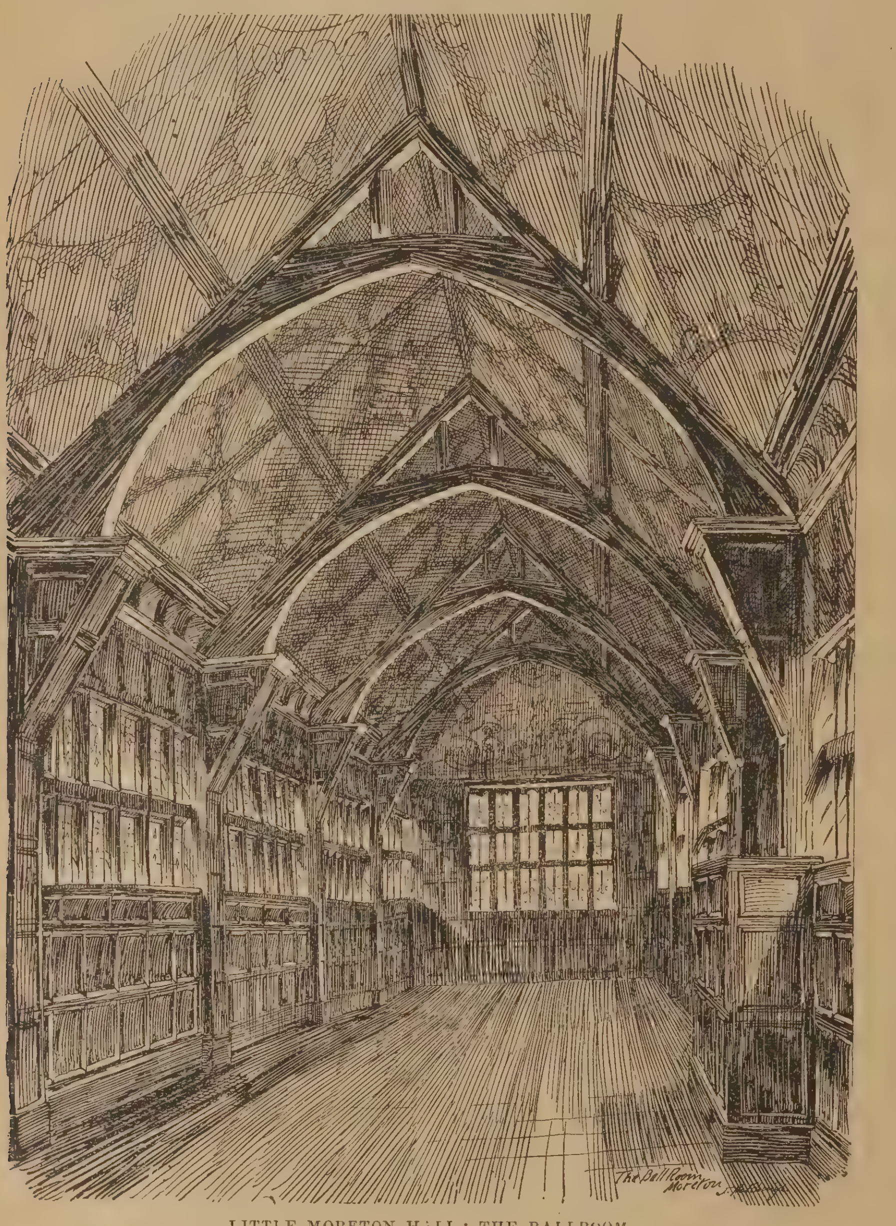
As the Rev. Baring Gould has pointed out, amongst the ancient yeomanry of this country it was quite customary for the master and mistress of a farmhouse to occupy the central bedchamber, the female portion of the household having their quarters on the one side and the males on the other; and as a necessary consequence of this rule the junior members of the family and the servants were obliged to go to bed before their elders and, practically speaking, under their eyes.

Among the many charming features distinguishing old buildings, one of the most delightful is their fitness for the locality. Thus, in the bare Moorland districts grey stone houses appear eminently adapted; the swamps and broads of East Anglia seem the natural home of brick and plaster; whilst in the forest lands of the country with equal propriety sprang up the log hut and timber mansion, wrought in such perfect harmony with their surroundings that they might almost have been raised by Nature's own hand. There is nothing strained or imported about these homes, but construction and ornamentation alike are the outcome of a direct and legitimate application of the means employed. In those days the great cost involved prohibited the transport of materials from a distance, except in exceptional cases, and consequently the building-owner was obliged to content himself with the products of the neighbourhood. Moreover, it was customary, for obvious economic reasons, for the proprietor to obtain a contract from some master-craftsman, who undertook to execute the work, the owner agreeing to supply the materials from his own estates. Such were the influences that produced in this district skilful carpenters and joiners of the type of Richard Dale.

This man probably learnt his trade from his father or from some relative or neighbour, and served an apprenticeship extending over many years at the bench and on the scaffold. During this time he would learn how to convert timber from the fallen trunk, he would master the methods of construction then in vogue, and become familiar with the traditional kinds of mouldings and ornament in common use; adding to his work that touch of individual fancy according as Nature had gifted him. In all probability his knowledge of the world was restricted to a circuit of a few miles from his native place, and he would remain within the spell of the same influences in which he was born.

The neighbouring church of Astbury owes some portion at least of its fine timber roof to this ingenious carpenter, as his name is cut on one of the main timbers.

The woodcarving at Moreton, though instinct with life and vigorously executed, is somewhat rude and coarse—plebeian, one might call it. Certainly it falls far short of the attainments of the mediæval carver both in design and execution, and altogether lacks the refinement of Italian Renaissance work. Still it possesses an eminently wooden quality and considerable variety of motive, besides being in good scale—qualities altogether absent in the realistic productions of the more scholarly and polished Grinling Gibbons school.



LITTLE MORETON HALL: THE BALLROOM.

The mouldings, on the other hand, are on the whole beautifully proportioned, simple in contour and workmanlike, and the shafts and mullions possess an appearance of structural sufficiency and strength, without a suggestion of heaviness, that contributes in no slight degree to the happy result of the whole composition.

The barge-boards are entirely free from ornament, but the present ones have all the appearance of modern execution; and, judging by the richness of the rest of the work, it is highly probable that their predecessors were enriched with carved ornament. Presumably the painted decoration on the plaster coves and panels is merely legitimate restoration, but in any case the custom is to be deplored; for in buildings of this nature, in which detail is so abundant, plain spaces are to be jealously guarded as a valuable foil to the richer portions, and to afford rest to the eye, which is apt to become jaded and confused by the multiplicity of detail. Besides this, the applied ornaments compete unduly with the wooden braces between the main beams, which justify their existence by serving a useful purpose and at the same time relieve the squareness of the principal framework. The roofs are covered with large stone slabs, of soft brown colour, which harmonize admirably with the sombre tones of the timber.

Though externally Moreton presents practically the same appearance to-day as it did in the Elizabethan era, except for the mellowing influences of upwards of two hundred years, the interior has suffered many minor modifications owing to constant changes of fashion, which, however tolerant of the outside appearance, has been wont to allow but little latitude from the accepted standard inside the home. Most of the original fireplaces have been mutilated or modernized; alterations of plan have taken place; a partition was constructed across the principal apartment in the front wing on the first-floor; and the ties and struts introduced, not always with the highest taste but with the best intentions, however necessary, do not add to the effect. Many of the floors have been concreted to preserve them from destruction; the walls have settled in all directions, so that the framework is alarmingly out of the perpendicular, and the floors undulate to an extraordinary extent. But with all these defects the interior is very fine, very massive, very beautiful.

The staircases without exception are of the spiral kind, constructed round an oak post at least 12in. across.

Plasterwork, for which the Elizabethan period was so noted, is only to be found in the upper storey of the front range. At one end of the ballroom in the gable over the window is a figure of Fortune poised on a wheel modelled in this material, and surrounded by a highly conventionalized and somewhat thin ornament based on the vine and bearing the legend "The wheel of fortune whose rule is ignorance." The corresponding gable at the other end of the apartment is decorated with a female figure of Fate, bordered by a similar pattern and bearing the legend, "The speare of destinye whose ruler is knowledge."

Another example of plasterwork is the fireplace in the small room adjoining the ballroom. But this is scarcely satisfactory, as it undoubtedly suggests stone construction and technique. The coat-of-arms in the panel is that of the Moreton family quartered with Macclesfield, surmounted by the greyhound, the Moreton crest.

There are some large wooden Renaissance brackets in the state apartments below, carved with considerable spirit and elegance, but they look somewhat out of place, supporting the moulded Gothic wood beams of the ceiling. Similar objection may be taken to the panelled brackets under the feet of the roof principals in the ballroom, the brackets appearing altogether out of proportion to the slender timbers they appear to support.

The leaded glazing, which is wrought in a vast variety of patterns, is said to be a faithful restoration of the older lights.

Little Moreton-cum-Rode is mentioned as two manors in Domesday book. Moreton was granted with other estates to William Fitz Nigel, in recognition of his services to the Conqueror. The new owner let the estate in fee to a knight, who after the prevailing custom adopted the name of Moreton for his patronymic. This family continued to inherit in the direct male line until the reign of Henry VIII., when Letitia Moreton conveyed the estate to Sir Graham de Lostock of Lostock Graham. Their grandson adopted the old family name, and his descendants continued to hold the manor until 1763, when the Reverend Richard Taylor, nephew of Sir William Moreton, Recorder of London, who was the last of the line, took possession and assumed the Moreton name. The property now belongs to the only surviving grand-daughter of the latter, a lady who took the veil and retired to Clewer, near Windsor, years ago.

In the year 1521 a dispute arose between Mr. Thomas Rode, proprietor of a neighbouring estate, and William Moreton as to who should take precedence in church and in processions, and William Brereton, of Brereton Hall, was called upon to settle this delicate question. The arbitrator with commendable judgment decided "that whyther of the said gentlymen may dispende in landes by title of inheritance 10 marks or more than the other, that he shall have the pre-eminence in sitting in the churche, and in gooing in procession, with all other lyke causes in that behalf."

This rivalry, though not always concerned with the same parties, appears to have been a standing grievance, as in the reign of Queen Elizabeth we find that an order was made, "that in the highest pew north side where the Mayor was accustomed to sit, that Richard Spencer Alderman should sit and be placed, in that his ancestors were builders of the same chancel." And in the same order William Moreton was assigned the first seat on the south side.

A certain Mr. Brook, a Presbyterian divine who earned the nickname of "Brawling Brook," and had the misfortune to be dispossessed of the living of Astbury at the Restoration, was befriended by William Moreton and was allowed the use of the private chapel until his death in 1664, at the age of seventy-two.

There are other reliques of the ancient inhabitants and visitors of this old house. On a window pane of one of the bedrooms are still legible the names of John and Mary Woodnothe, and beneath the following couplet :—

Man can noe more know woemen's mind by teares
Then by her shadow hede ye what clothes she weares.

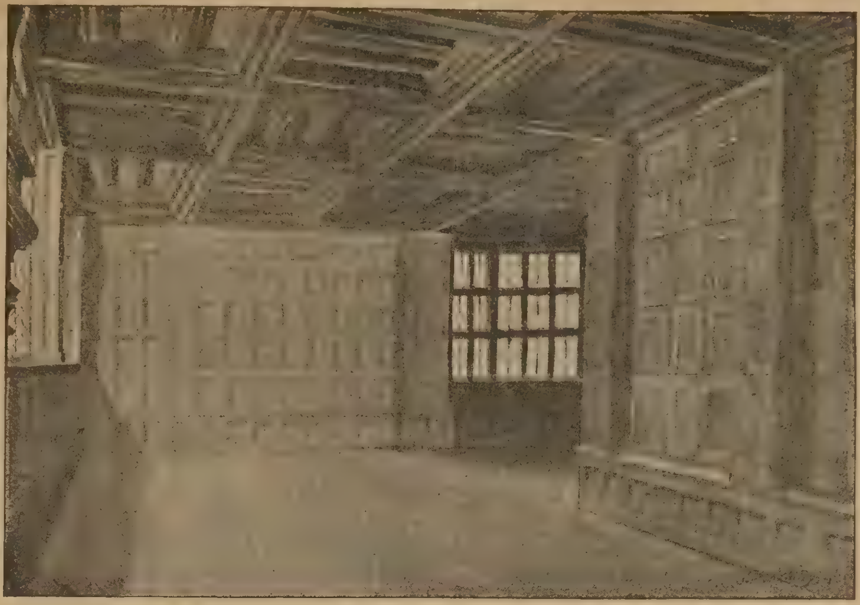
John Woodnothe, who inherited Shavington Hall in 1634, married Mary, eldest daughter of William Moreton, the grandson of that William Moreton who erected the additions to the Hall in 1559. Apparently the lady was subject to moods, and puzzled her husband not a little.

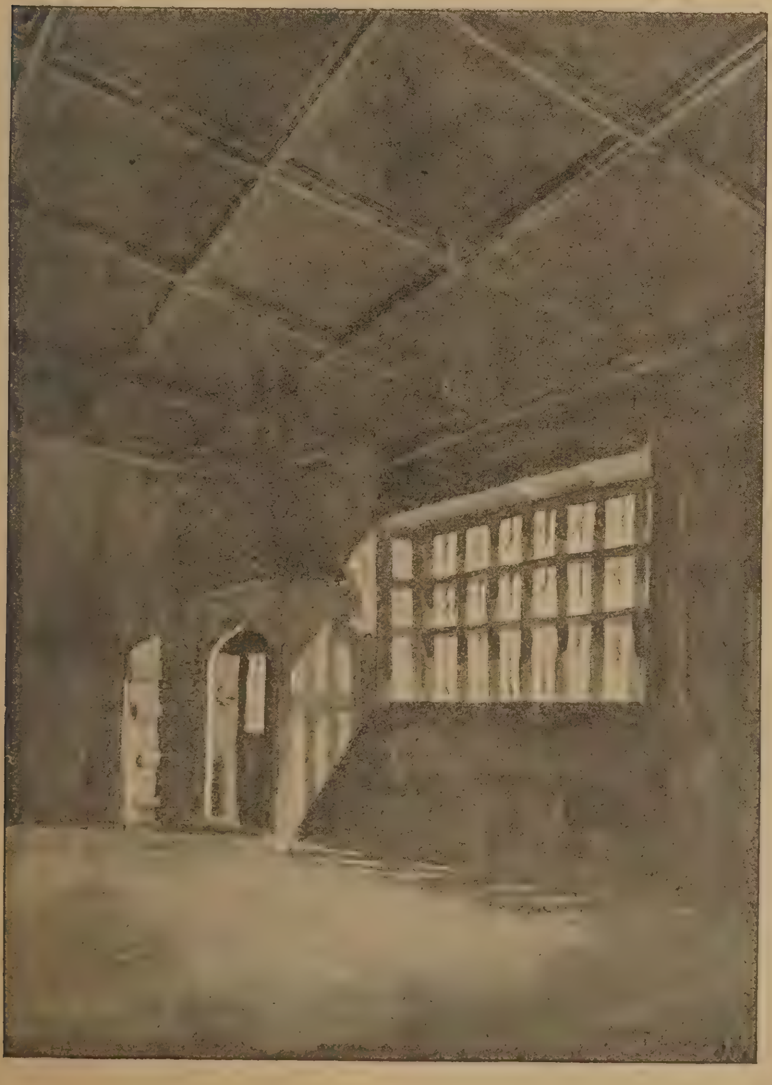
Many other names are discernible—members and connections of the family—but the neatest couplet remaining is that scratched by an unknown hand upon one of the windows of the ballroom. It reads as follows :—

I stay here both day and night
To keep out cold and let in light.

Some of the Mortons cut no mean figure in their day. This Richard Moreton distinguished himself by marrying the heir to the Macclesfield estates in the reign of Edward III., which property he duly added to his own. Ralph, who died about 1509, probably erected the oldest portions of the present buildings. William, grandson to the latter, whom we have had frequent occasion to mention, died in 1563, a few years after the completion of his building operations. Dr. Edward Moreton was an eminent divine who married a niece of Archbishop Laud. Sir William, the last of the second line of Moretons, was Recorder of London.

Still, as we said before, thy ancient walls tell their own story, Old Moreton! And as we turn from the musty annals of a by-gone age, to take one longing lingering look of farewell, we cannot forbear to express our thankfulness to see thee in the hands of one who loves and cherishes thy crumbling fabric; with tender care adding the prop and buttress wherever demanded by the accumulating infirmities of age, without defacing or injuring thy quaint and picturesque beauty.


LITTLE MORETON HALL : THE WITHDRAWING-ROOM.


LITTLE MORETON HALL : THE STATE APARTMENTS.

ARCHITECTURAL ASSOCIATION.

ENGLISH DOMESTIC ARCHITECTURE, 1100-1800.

BY J. ALFRED GOTCH, F.R.I.B.A.

A MEETING of the Architectural Association was held on Friday evening last, the chair being occupied by the president, Mr. Seth-Smith. After the minutes of the previous meeting had been read and confirmed, Mr. A. D. Thacker (London, W.) and Mr. G. M. Page (London, S.W.) were elected members of the Association.

The president announced the following additional donations to the New Premises Fund :—

	£	s.	d.
T. G. Jackson, R.A. - - - -	50	0	0
F. T. Baggallay - - - - -	31	10	0
A. Saxon Snell - - - - -	26	5	0
John Slater - - - - -	26	5	0
E. J. May - - - - - -	21	0	0
S. Flint Clarkson - - - - -	10	10	0
Hippolyte J. Blanc - - - -	10	0	0
G. C. Ashlin - - - - -	5	5	0
H. B. Creswell - - - - -	5	5	0
C. Harston - - - - -	5	5	0
T. H. Russell - - - - -	5	5	0
E. Howley Sim - - - - -	5	5	0
B. H. Webb - - - - -	5	5	0
W. Woodward - - - - -	5	5	0
G. B. Carvill - - - - -	5	5	0
E. R. Chambers - - - - -	5	0	0
A. Hill - - - - - -	5	0	0
H. S. Noblett - - - - -	5	0	0
A. H. Belcher - - - - -	3	3	0
W. Stewart - - - - -	3	3	0
H. Cayley - - - - - -	2	10	0
H. Lovegrove - - - - -	2	2	0
W. L. Lucas - - - - -	2	0	0
Cole A. Adams - - - - -	1	1	0
E. A. Agutter - - - - -	1	1	0
C. M. Armstrong - - - -	1	1	0
W. J. Devlin - - - - -	1	1	0
S. J. Tatchell - - - - -	1	1	0
A. S. Tayler - - - - -	1	1	0
J. T. Woodard - - - - -	1	1	0
	252	15	0
Donations previously announced	3,183	17	0
Total - - -	£3,436	12	0

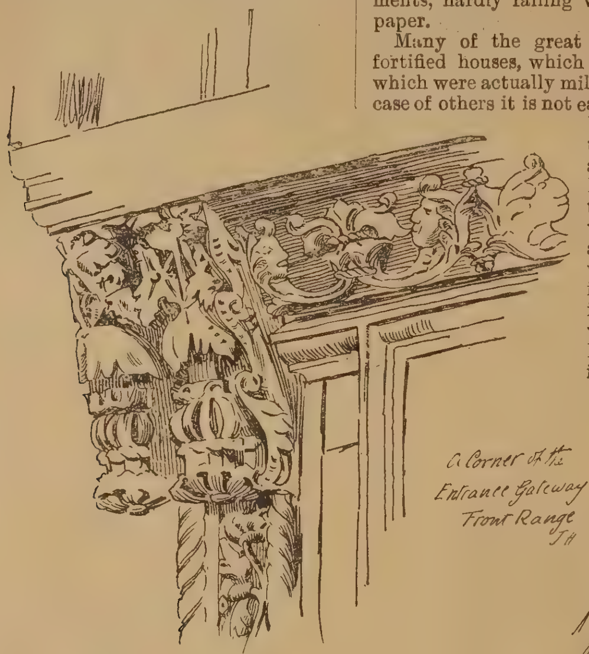
He remarked that they would be very pleased to receive small donations from their members; it was just those which expressed the sympathy with the scheme which they desired, and he therefore urged members not to be deterred for fear of comparison with the larger donations of other men. He also stated that the Fund was kept entirely separate from the rest of the Association's affairs. The president then announced that the spring term of the Day School would commence on January 13th, and in doing so he said that nothing could be more satisfactory than the work done during the first three months of the school.

Mr. J. Alfred Gotch then read a paper on "The Development of Domestic Architecture in England from the Twelfth to the Eighteenth Century." He said :—

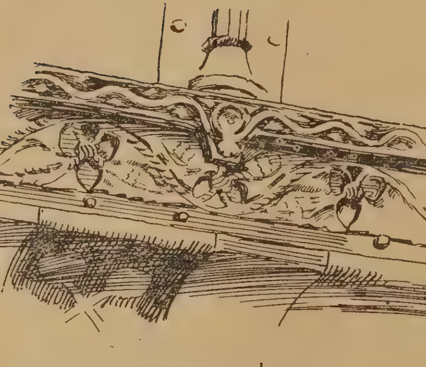
The subject is large; so large that one-half of it has filled the four portly volumes of Messrs. Turner & Parker on the "Domestic Architecture of the Middle Ages," and as that work would take, on a moderate computation, four-and-twenty hours to read aloud to you, without any interval for rest or refreshment, it is quite obvious that the view of the subject which we take this evening must be cursory and confined to but a small part of the whole range of research.

The Rooms.

In the present day we should classify the accommodation of a house in three main divisions: the reception-rooms, the bedrooms, and the kitchens or servants' quarters. Going back to the times of the early Georges, the same classification holds good, but the bedrooms were less important, and the reception-rooms much more so. Still further back, in Elizabeth's days the same division is applicable, but we find the chief apartment among the reception-rooms to be the great hall. The bedrooms were largely left to take care of themselves. In all three periods the kitchen department is fairly commodious. But if we go back to the thirteenth or, further, to the twelfth century, the bedrooms practically disappear, and only the reception-rooms and the kitchens remain. Indeed, when we reach these primitive times it becomes necessary to alter our classification somewhat. There are still three kinds of rooms, but they consist of hall, solar, and kitchens, the solar being the private apartment of the master, or, to use a more appropriate word, the lord. These three rooms are the nucleus from which grew the vast mansions of Elizabeth and Anne; and the development of domestic architecture consists largely of the development of this one single apartment for the lord into the separate apartments which are now provided for each of his household.



A Corner of the Entrance Gateway Front Range J.H



Carving - Richard Dale's Work

Carving Front Range Court-Yard J.H

Houses in the Middle Ages.

There is this initial difficulty in investigating the houses of the early Middle Ages—that most of them have disappeared. They were as a rule built of wood and plaster, only some of the more important being of durable materials. Those which have survived have suffered so many alterations in the course of their existence that their original arrangements are not always to be made out. Nevertheless, from such remains as survive and from the rare references to such matters as have come down to us in contemporary writings, it is quite clear that houses consisted of, first and foremost, a hall, then at one end the solar or solerre (as it is also called), and at the other the kitchen with its subsidiary apartments.

The houses of that time were comparatively limited in number. There were the king's houses (of which he had a good many in different parts of the country), the houses of the great barons, and the manor-houses. Besides these there were the great religious establishments, which, however, had their own special arrangements, hardly falling within the scope of this paper.

Many of the great barons lived in highly fortified houses, which we call castles, some of which were actually military strongholds. In the case of others it is not easy to draw a distinct line between the castle and the house, for they were all more or less fortified. But at present it is not the military strongholds which are under consideration, but those dwellings which were only fortified in order to secure their inhabitants. Such a house was the Peak Castle, in Derbyshire. The dwelling part was the keep or tower, the ruins of which still crown the summit of the isolated piece of land. This keep resembles the peel towers of the Scottish border, many of which still remain both in Northumberland and in the Lowlands of Scotland. It is a square tower of three or four storeys, each floor containing one room. The basement was a cellar; the floor above it contained the hall; over the hall was the lord's private apartment. This arrangement is very primitive, and represents what must have been the minimum in the way of accommodation which was tolerated. This vertical disposition of rooms, one over the other, soon gave way to a disposition which placed most of them on the ground floor, or if they were not on the ground floor they were spread out into a form less rigidly vertical.

Whatever arrangement was adopted, however, the hall was the chief apartment. It was the largest, the most permanent, and the most central. It was, in fact, the dwelling-place of the household, and became synonymous with the house itself, which was in most parishes known as "The Hall." In this apartment the whole household lived, ate and slept; all save the lord and, possibly, his family, who had a separate room into which they could retire, already mentioned as the solar. The solar appears to have been almost always an upper chamber, built over an apartment which was often used as a store place; but there are so few remains of these very early houses that the exact arrangements can hardly be made out with certainty. The solar seems to have been approached in many cases by an outside staircase. But, at any rate, this much is clear, that the hall stood in the middle, between the solar and the kitchen, the latter being the third of the three main classes of rooms which these early houses contained. The cooking was not done in the hall, but in a separate building devoted to the purpose, attached to which were a few subsidiary rooms such as the larder, where the food was kept; the sewery, where provisions, linen and table furniture were stored; the cellar, which was used for general stores and wine; and the buttery, where the drink was distributed. These smaller rooms were not always provided—their presence depended on the importance and size of the house; but there were always and in every house the three divisions of hall, solar and kitchen, the hall lying between the other two. The arrangement of the hall was simple, and remained the same in principle from the earliest times down to the seventeenth century. It then underwent a change which marked a complete revolution in domestic architecture, and which will be described in due course.

The hall, lying, as already said, between the solar at the upper end and the kitchen at the lower, was entered, close to the latter, by a door in its side wall. Through the lower end wall were doors leading to the kitchen department—sometimes two, sometimes three. Of these one opened into the buttery, one into the kitchen or kitchen passage, and the third (if there were a third) into the pantry. There was usually a screen stretching across the hall to keep off the draught from the open door, and more particularly to screen off the kitchen traffic, for draughts would still come through the windows, which were seldom glazed in early times. There were doors (generally two) through the screen into the hall itself, and there was a ceiling to the passage cut off by the screen, which formed a gallery usually known as the minstrels' gallery, although it is tolerably certain that very few of the ordinary households could have supported a private band. At the end of the hall, away from the screen, was the daïs, which was a raised platform, a few inches high, whereon the lord and his family and principal guests sat to dine. In this upper end of the hall was a doorway leading more or less directly into the solar.

Oakham Castle.

Both the solar and the kitchens were sometimes built of wood, as were also many of the subsidiary apartments. Such fragile buildings have disappeared, leaving in some cases little besides the hall to tell of the former extent of the house. This may have been the case at Oakham Castle, where the hall alone remains of the building erected about the year 1180 by Walkelin de Ferrers. But this hall is an extremely fine example of its kind; it is of considerable width, and the roof is carried in three spans, one over a central nave and the other two in the shape of a lean-to against it—an arrangement similar to that adopted in churches, and serving to remind us of the similarity of treatment adopted in both ecclesiastical and domestic buildings.

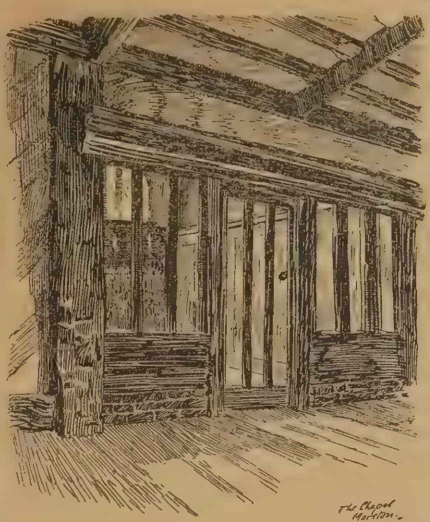
The windows are small and low down, and they have in common with the doorway the characteristics that distinguish the transition from Norman to Early English. The interior might well be taken for that of a church, with nave and aisles; but the position of the doorways in the end walls, the treatment of the windows on the inside, as well as the absence of any indication of a chancel, would put the wary enquirer on his guard. The hall stands alone, the solar and kitchens—which must have existed—having disappeared. It may be that they were burnt, for accidents of that kind happened not infrequently. If not burnt down, these rooms may have been blown down, as were the royal kitchens at Oxford in the seventeenth year of Henry III.

It seems quite clear from these and other specific references that many of the subsidiary rooms were built of wood, although the hall was of more durable materials.

Personal comfort was not much studied in those days; men were content to sleep where they could; and as they were not particular about their beds, so also they had simpler views than we have about the heating of their rooms. In some houses only the solar had a fireplace; the hall was heated by a fire in its midst, the smoke finding its way out of a louvre on the roof. Here and there the hall had a fireplace of its own. The smoke from the central fire found other vents than the louvre, for but few of the windows were glazed; wooden shutters served to keep out the weather. In some grand houses the part above the transom was glazed, while that below retained its shutters. But people were susceptible to draughts even in those hardy days, for Henry III. directed a window in the queen's room in the Tower to be glazed, "so that the chamber might not be so windy." It was in his reign, too, that the practice of wainscotting rooms—that is, lining the walls or the roof with wood—was introduced.

Stokesay.

At Stokesay, which was built in the thirteenth century, the main dispositions conform to the usual type. There is the large hall entered at the end of one of its sides. At its upper end is a door which eventually gave access to an outside staircase leading to the solar. At its lower end is a cellar, over which is an apartment with a fireplace. This room was reached by a staircase in the hall, standing in what would ordinarily be the screens. Of the kitchen there do not appear to be any remains. Beyond the upper end of the hall is a tower which was used for defensive purposes, upon the particulars of which it is not now needful to dwell. The details of the work are characteristic of the thirteenth century. The hall windows are of two pointed lights surmounted by a circle. The lights, which are divided horizontally by a transom, were provided with shutters, but the circle was apparently always open for the winds of heaven to blow through, and doubtless it was through them that most of the smoke from the central hearth escaped.



LITTLE MORETON HALL : THE CHAPEL.

Yanwath Hall.

Yanwath or Yanwith Hall, in Westmorland, was built early in the fourteenth century, but underwent considerable alterations in the sixteenth. The same arrangement was adopted here as in the former examples. The great hall was approached through a passage, which was enclosed by a stone wall on both sides instead of having one side formed by the wood screen of the hall. On the left of the passage was the kitchen, on the right was the hall. The hall itself had a fireplace instead of a central hearth, and this fireplace was at the lower end of the hall. In later times it was more usually placed near the lord's end. There is also a bay window—a feature which became subsequently of universal adoption. The solar in this instance is developed into several rooms, situated in a tower, and exhibiting the usual characteristics of the accommodation of a peel-tower—namely, one fair-sized room on each floor surrounded by thick walls, in which are contrived various diminutive apartments, access being obtained from floor to floor by means of a narrow newel staircase.

In addition to the usual accommodation which has hitherto been mentioned, Yanwath had a number of other rooms arranged so as to form an enclosed courtyard, one side of which has, however, disappeared. The entrance to this courtyard was through a gateway nearly opposite to the hall door. This courtyard idea, which arose from the necessity for defence, lingered on, as we shall see, for reasons of appearance, long after the need for defence had ceased.

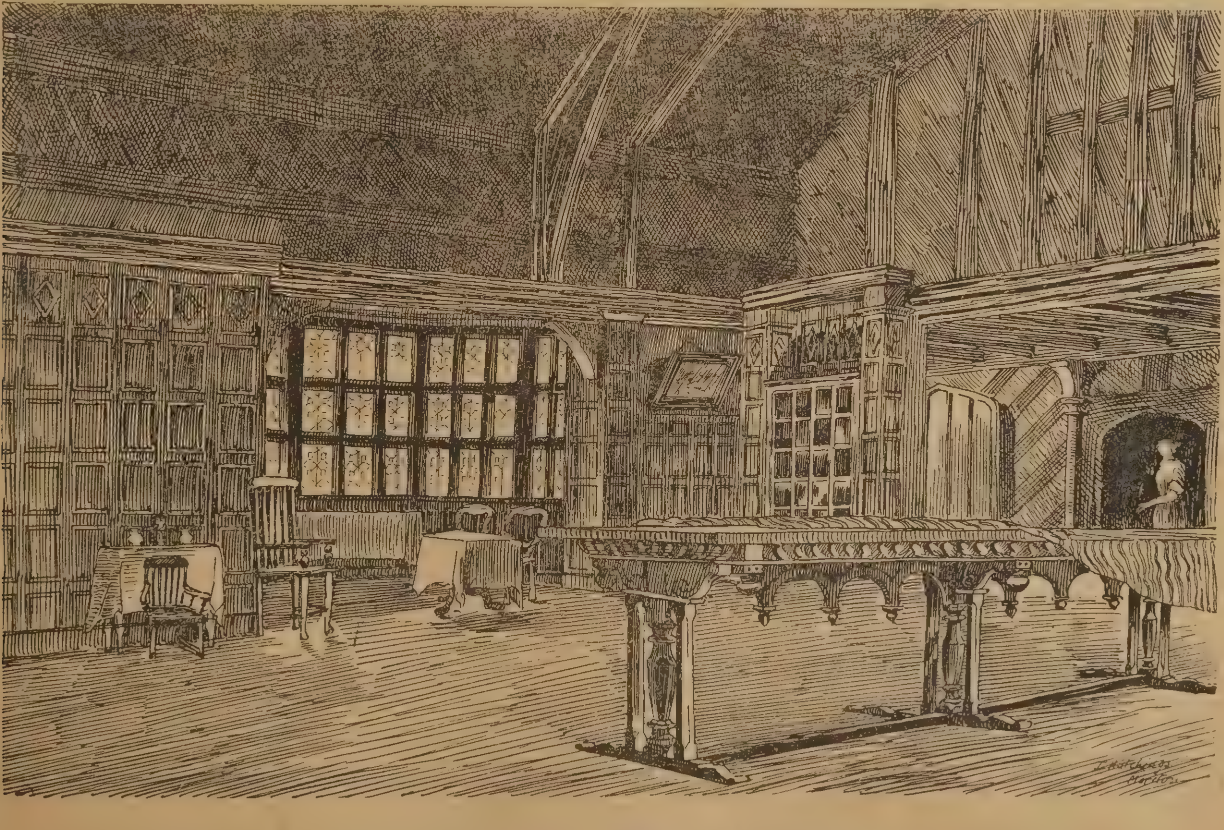
At Sutton Courtney,

in Berkshire, is a house built about the middle of the fourteenth century in which the usual disposition of rooms is again found. There is no bay window to the hall, but it is worthy of note that below the main window at the daïs end is a low side window, probably contrived for the pleasure of the occupants of the daïs. In later times, while the hall windows were almost invariably high up from the floor, the bay window of the daïs was equally invariably brought down low enough to afford an outlook. The lofty hall roof still remains (or remained when Turner and Parker wrote), and the general character of the work led to the hall being called the chapel—another illustration of the wide-spread but fallacious notion that Gothic forms of necessity indicate a religious edifice.

The hall itself was usually a lofty building, with an open-timbered roof. It divided the house into two separate halves, which, if they were of two storeys, had to have their own separate staircases. The walls of the hall were often plastered, and for ornament they were hung with the spoils of the chase, or else with pikes, guns and bows, with old swords and bucklers that had borne many shrewd blows. A good example is to be seen at Cothele, in Cornwall, and also at Haddon Hall, where the fifteenth-century wood screen still remains.

Haddon

is a fine example of a large fifteenth-century house built round two courts, and still exhibiting a considerable desire for defence. The hall, as was usual in double-courted houses, was placed in a wing between the two courts, thus being in the most central and best protected position. It was flanked, according to the usual custom, at one end by the buttery, pantry and kitchen, and at the other by the family apartments, hitherto confined to the solar, but now developing into the parlour and other rooms, including a number of separate bedrooms. The plan of Haddon shows the great chamber,



LITTLE MORETON HALL : THE BANQUETING HALL.

and the long gallery, but it should be remembered that the great chamber was probably not so called prior to the sixteenth-century, while the long gallery was contrived over the walls of a number of earlier rooms towards the close of that century. The kitchens here are much more elaborate than in any of the previous examples, and they go to show that the wants of a large household and a hospitable lord were both great and permanent, and not so liable as in ancient days to interruption from hostile visitors.

The possibility of such interruptions was never absent from the minds of the builders of those days. Houses were nearly always surrounded by a moat where the nature of the ground permitted it. The entrance gateways still followed in many cases the ancient fashion of placing an archway between two towers. The courtyard plan still held the field in houses of any pretensions. As the years went on the character of the ornament changed, just as it changed in churches. The tracery disappeared from the windows, which became flat-headed; doorways likewise became less aspiring, and assumed the obtuse angle of the Tudors. Fan tracery made its appearance in various places, such as the ceilings of bay windows and porches; circular stairs were placed in turrets, which were carried up above the main block of the building and crowned with lead cupolas. The splendid brick chimneys of Henry VII. made their appearance, with all their intricacy of cut and moulded brickwork.

Then came

The Italian Influence,

which first made itself felt in unimportant ornament, and then spread to shaping the building itself, reducing it to symmetry so far as the exterior was concerned, but leaving the interior still to be arranged after the old fashion.

It brought also that exotic feature, the loggia, or open arcade, which, however, never obtained a really firm footing in English houses. Indeed, all through the sixteenth-century and the first quarter of the seventeenth the new Italian influence never overmastered the old irregular English habits. But under the accomplished Inigo Jones, as we shall presently see, symmetry, which had hitherto been kept to the outside of the house, invaded the inside as well.

Elizabethan Plans.

However much the character of the ornament may have varied, the character of the plan moved but slowly and always in one direction. Haddon and Apethorpe, two large houses, have shown how the old type grew at its two ends, the hall remaining as of old, but the kitchen and the private apartments undergoing considerable increase and development. On a smaller scale Canons Ashby tells the same story. So do the plans of Elizabeth's time, such as Cannons on a small scale and Kirby on a large scale, both taken from Thorpe's book. In looking at these plans it is obvious that the old idea is still the foundation of the arrangements, although in a great place like Kirby the accessory apartments have become vastly multiplied, and all thought of defence has been abandoned. Houses are no longer built for safety, but for show. Windows which once were sparingly introduced into the outside walls—that is, the walls looking out on to the country—are now used without restraint, and are regarded quite as much from the point of view of how they will help the composition of the design as from that of usefulness in lighting the rooms. Cheerfulness, splendour, comfort (of a kind)—these are the qualities now sought after. The hall had long ceased to be used as a sleeping apartment.

It was not always used even as an eating place. Not only had the ancient solar developed into the parlour, but the parlour had been developed into the summer parlour, the winter parlour, and the dining parlour. It was no longer on the upper floors, but close to the hall on the ground floor. It was no longer the only bedroom, for bedrooms had been indefinitely multiplied, and, under the name of "lodging," fill up any space in old plans to which no more fitting name could be given. The solar had still further developed. In addition to the parlours on the ground floor, there had arisen the great chamber on the upper floor, and the long gallery—that feature peculiar to Elizabethan houses.

Internal Finishing and Decorating.

The finishing and embellishment of these rooms had developed along with their number. In the days of Henry III. we hear of plastered walls, and wainscotted walls and roof, but the rooms were extremely draughty, and the smoke from the central fires must have been almost intolerable; there was, indeed, no great inducement to abolish draughts so long as the smoke hung about the room. But the discomfort of draughts and smoke gradually told, even on the iron constitutions of mediæval knights, and by degrees fireplaces with a special flue for the smoke grew more common, and the smaller rooms were furnished with them. Draughts were excluded by filling the windows with glass, and later by plastering the ceilings as well as the walls. Indeed, the ceilings were plastered more frequently than the walls, which were usually covered either with tapestry or with panelling. The plaster on the ceilings was not kept plain, as it usually is in our days, but was worked into an infinite variety of ornamental patterns. Indeed, by the period at which our story has now arrived, the fitting up of rooms had reached a point of development beyond which we have not gone very far.

Down to the end of the sixteenth century, and, indeed, as far as the first quarter of the seventeenth, the old type of house plan was still used—the old type which had prevailed in the days of the Norman kings. It is true that the ancient idea had been greatly developed; the kitchen department had been so much enlarged as sometimes to require a court to itself. The single private room, the solar, had been multiplied into several parlours, the great chamber, the long gallery, and many "lodgings" or bedrooms. But the hall still remained the centre of household life, and the daïs, which indicates its use as a living room, is shown on nearly all the plans in Thorpe's book. This enormous development of household convenience and comfort would, of course, have been impossible had the first idea of the builders been, as of old, to secure safety; but it was not, and as the certainty increased that a man need not depend upon his own efforts to preserve his security, but the public authorities, so he found more leisure to attend to his comfort, and for securing greater privacy for himself and the members of his household. The great hall began to feel the influence of this change; it had long ceased to be used as a sleeping apartment, and now it ceased to be used for meals. The family withdrew at one end, the servants at the other, and it became merely a vestibule. Concurrently with this change of use there went a change of idea in planning. The symmetrical disposition of houses which the Italian influence produced demanded that the hall should be central. Long-established custom demanded an entrance at one end of the hall, in the "screens," which, therefore, could not be in the centre of the façade. There are a number of examples, both in Thorpe's plans and in actual houses, of how these difficulties were surmounted. But when the hall was no longer wanted as a living room, there was no longer need for the entrance to be in its old position at the end, and the imperious demands of symmetry were satisfied by placing the hall in the centre of the façade and the entrance door in the centre of the hall. This point is curiously illustrated by comparing Thorpe's plan of Aston Hall with that of the house as built. Thorpe shows the door in the old-fashioned situation at the end; it was actually built in the centre, and the hall here definitely ceased to be a living-room and became a vestibule. This change is a momentous one, for it brings us out of the mediæval idea into the modern.

But although at Aston the plan shows a new departure so far as the hall is concerned, it still follows the old lines in its general grouping, and so does the external appearance. The triumph of foreign fashions over native was, however, near at hand, and it was Inigo Jones who brought it about. At

Raynham Hall and Coleshill

the plan is no longer founded on the old type. The hall is not the chief apartment, with the family at one end and the servants at the other. The latter have descended into a basement, and the whole ground floor is occupied by family rooms. Traces of the old fashions remain in the projecting wings and in the gables with which they are roofed. But in Coleshill, another house of Inigo Jones, the foreign influence is even more marked, the plan is still more symmetrical, the elevations are still more classic. In neither house are the windows mullioned; they have sashes, and the change from mullions to sashes marks the final disappearance of the last traces of mediæval treatment.

The lesson in foreign fashions which Jones gave his countrymen were continued by Wren, and bettered by his successors in the eighteenth century. At Raynham and Coleshill one cannot help thinking that the snugness of home is sacrificed to the demands of stateliness; but at Blackheath and Keddlestone it is lost altogether, and the inhabitants of those great houses must daily pay a penalty inflicted by grandeur. The component parts of the house are divided into separate blocks with tiresome corridors of communication.

The great houses of the eighteenth century make a brave show, but they exhibit a profound scorn for the small amenities of household life. They were build in an artificial age, and, like the huge wigs which their builders wore as an indispensable part of their costume, they were intended rather for the admiration of the beholder than the comfort of the owner.

But the pursuit of comfort, which was the propelling force in all the changes of domestic architecture which we have been tracing, although it was neglected by the great in the days of Anne and the Georges, was still followed by persons of humbler ambitions, and in the smaller houses of the eighteenth century there is much that is admirable. Much skill and care was expended upon their internal embellishment, and the woodwork of that period is always worth our careful study. This is not the occasion upon which to enter on a minute description of the respects in which it differed from that of Elizabeth's time; this only need be said, that it followed the general tendency of domestic architecture in adopting largeness of scale and dropping minuteness of parts. Wilton House and the Brewers' Hall sufficiently indicate the change of treatment.

This long story must now come to an end. It has not dwelt much on details; it has rather sought to show that our domestic architecture has undergone a real process of evolution, and that it has reflected, as indeed one might suppose that it would, the habits and wants of well to-do English people. A continuous thread runs through the whole series from the Conqueror to the Georges, and the vast Palace of Blenheim can trace its origin back to the lonely little tower perched on the hill above the Peak Cavern at Castleton.

The president observed how happily Mr. Gotch's book on "Early Renaissance Architecture in England" fitted in with Mr. Blomfield's work dealing with the succeeding development. With regard to the paper they had just heard he remarked that wherever necessity dictated any particular form or planning, that necessity was ever conservative, and, consequently, we saw how very gradual was the adoption of any new feature; but this would not hold good in regard to ornament, which seemed more to be ruled by fashion. Mr. Douglass Mathews moved a vote of thanks to the lecturer, which was seconded by Mr. H. H. Statham. Mr. Arnold Mitchell, Mr. G. M. Nicholson and Mr. N. F. Barwell also spoke, Mr. Mitchell giving some personal recollections of a stay in a large Elizabethan house to illustrate how awkward the planning was from the standpoint of household service and convenience. Mr. Gotch replied, and the meeting then ended.

A New Police Station at Arundel is being erected. It is a red brick and stone building situated practically next door to the present police station; and in addition to the living accommodation for the superintendent there is a charge room and office, with four cells at the rear of the premises. Hitherto it has not been possible to keep a prisoner at Arundel who was under remand, because the present cells at the town hall are underground. The provision of the new cells will, therefore, be not only a convenience but a saving of the expense incurred in sending prisoners to Portsmouth while under remand.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Beauty in the arts is but a natural or educational prejudice, and inconstant, since it depends only upon the fashion of the time.—M. FREZIER.

Our Plates. THE proposed country house by Mr. W. Kidd is to be built at Pinner. On the ground floor are arranged entrance hall, drawing-room, dining-hall and schoolroom, kitchen and offices, &c.; and on the first floor four bedrooms, boxroom, bathroom, &c. The floor of the entrance hall will be laid with black and red tiles, showing broad cement jointing, the walls to be plastered and coloured in terra-cotta, with 15in. dead white frieze, around which would be written in old English characters, "If ye come as a friend, enter, and peace be with thee; if as an enemy, enter not in the guise of friendship." The staircase to be in oak, with square newels and balusters taken up to ceiling. The dining-hall would be plastered and distempered pale grey-green to a height of 7ft. 6in. with a broad flat frieze rail, and the frieze to be of plaster tinted a warm cream. The floor joists of the room above show in the dining-hall proper, and would be of heavier section than usually required, but spaced 2ft. apart, the ceiling being taken half-way up these joists and attached to a frieze simply by a cove. From the frieze rail would hang an arras of casement flax material a shade deeper than the walls, hung flat, at the top of which a design representing a hunting scene in colours of white, brown, orange and purple would be appliqued. At the end of the dining-hall is arranged an ingle-nook of sufficient size to allow one to sit comfortably in it, the floor of which would be in tiles of various shades, showing broad cement joints; and the ceiling is kept 15in. below that of dining-hall. The drawing-room would be decorated in shades of rose, blue, purple and orange, with a frieze representing an old-fashioned garden and all woodwork painted ivory-white. The schoolroom has been designed in a manner which will take away the usual severity of this class of room, and is panelled to a height of 4ft. 6in., above which would be stencilled a design representing several nursery rhymes. The principal bedrooms will be decorated in similar schemes. The internal decorations have been designed by the architect, and the friezes in the drawing-room and schoolroom will be executed by him. The elevations are treated in cream rough-cast, with blue-brick string-courses at the floor levels; all casement windowsto be leaded-lights; the roof to be of dark-green slates. Care has also been taken in the arrangement of the garden to give as small contrast in colour as possible.—The White House, Ealing, is to be in brick and rough-cast, with dark-blue brick string-courses, the window frames to be flush with the face of the wall, and the roof to be of dark-green slates.—The original rood-screen at Cranfield Church, judging from the fragments remaining, was one of the greatest interest and beauty, and this design (which was accepted for last year's Royal Academy) has been made from a very careful and minute study of the few pieces left. The date of it was clearly of the end of the fifteenth or the beginning of the sixteenth century. It shows in parts most interesting evidence of the influence of the Italian Renaissance, not so much in the mouldings and tracery as in the smaller details of the carving in the panels; this is more evident in the two end panels, which are solid, and were evidently the last portions of the screen to be completed. In making the drawings for the screen the architect's aim has been to retain the whole of the old work, but to give to the design a distinct twentieth-century feeling, so as to speak clearly of its reconstruction in this century.—The house at Munstead, near Godalming, was designed for Mr. William R. Pullman. It is situated in the midst of a pine wood. The roof is covered with green Tilberthwaite slates, and the whole of the walls with Portland-cement rough-cast. Internally the dining-room is panelled with oak, and the hall with cedar-wood of extremely beautiful grain. Miss Gertrude Jekyll has designed the gardens. The builders were Messrs. Kingerlee & Sons, of Oxford.

Egyptian Rock Tombs. THE ROCK TOMBS OF SHEIKH-SAID are described by Mr. N. de G. Davies in the Tenth Memoir just issued by the Archæological Survey of Egypt. This necropolis, excavated in the cliffs on the eastern bank of the Nile, about 180 miles south of Cairo, apparently formed one of the chief places of burial for persons of importance in the district. The tombs, which have already engaged the attention of explorers, are rock-cut chambers, sometimes single, sometimes connected, scattered irregularly along the line of crags, and are unfortunately often much dilapidated. As they formed a local centre, not directly connected with the general history of the kingdom, their dates are not easily determined, but one of the most important can be linked with the fifth dynasty, and some in an inferior style may be as late as the seventh or eighth dynasties. Graffiti and other remains show that certain of them were used as Coptic dwellings, probably about the fourth century of the present era—one, indeed, much to its detriment, having been converted into a church. But the decorations are often interesting, particularly those in the rich tomb of Urarna, together with that of his father. They were princes, apparently in the fifth dynasty, who ruled the hare nome or province, and these sepulchres give a vivid picture of the life and occupations of the ancient Egyptians more than 5,000 years ago.

Lord Leighton's House. THE royal borough of Kensington has distinguished itself by resolving to accept the gift of the sisters of the late Lord Leighton and to assume the care and management of Lord Leighton's house. For some time past the house has been open to the public, and all who have seen it will have realized the importance of permanently securing the house and its contents to the public. The distinguishing features of the house are its suite of studios and the celebrated Arab Hall. In this hall Lord Leighton gave rein to his passion for rich colour and beauty of workmanship. The walls are lined with exquisite Persian tiles of the best period, the light is admitted through full-tinted Damascene glass and Caneni lattice-work. The studios are equally characteristic. They are workshops, but not mere workshops. The large studio is a carefully-designed room of considerable size, used by its former owner as a music-room as well as a studio. Since the house has been open to the public this studio has been the scene of many lectures and concerts. It will seat about 150 to 200 persons, and is an ideal room for chamber music. The glass studio is equally well suited for such exhibitions of paintings or engravings. Sketches illustrative of folklore and fairy tales, Constable engravings, and examples of stipple work have successively been shown to great advantage in this room. There is still another studio, known as the Silk-room, from a corner of which a glimpse of the Arab Hall may be had. This again is well adapted to be the permanent home of fine studies and drawings. Lord Leighton's methods are well known. Every finished picture was preceded by a long series of studies. Every figure, almost every limb of every figure, was separately sketched, and not once, but often, and under varying conditions. Drapery was arranged and rearranged, groups were compared, coloured sketches made. Fortunately these chips of the workshop have been preserved, and with them the house is now furnished. Under the management of the council the house will, of course, be open every day free of charge. While Lord Leighton's own sketches will always constitute a principal feature of the house, there will be place in the ordinary living rooms for any art collections of the borough, while the glass studio will be available, as hitherto, for special loan exhibitions from time to time.

Woodcarving by Machinery. IN view of the fact that two-thirds of the furniture now made in Great Britain is made by machinery, it is interesting to note some remarks which recently appeared in the "Times" on this subject. The writer said: "Not only do the machines produce sections or parts of furniture by the hundred or the thousand in a marvellously short space of time; there is the further consideration that the machines do work of a kind that seems almost incredible. There is, for instance, an automatic carving machine which is a perfect marvel of ingenuity. A workman puts a piece of timber into the machine, which he locks up, sets going, and then leaves to itself. Half an hour later he returns, finds that the machine has stopped of its own accord, reopens it, and takes out the piece of timber, converted into an elaborately carved panel. This, when it has been finished off, could not be distinguished from a similar panel which an ordinary woodcarver might take a week to produce by hand. There is another machine which, worked by a boy, will carve four panels at a time, the cutting tools being guided by a metal pattern, and each acting simultaneously on a piece of timber placed on a separate shelf in the machine. Thanks to such devices as these, cheap bedroom suites, for instance, can now be provided with an amount of ornamentation which would otherwise be impossible at the price." We would remark however, that "at the price" it would be better if there were not such an abundance of "ornamentation."

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

An Old Architectural Book.

BECCLES.—With regard to the enquiry on p. 350 of our last issue, a correspondent informs us that he possesses a copy of "Reigles des Cinq Ordres d'Architecture de Vignolle." It is dated 1657. The book is 6in. long by 4in. wide and about ½in. thick. It contains 102 pages, with a plate and description to each page.

Tar-Macadam Roads.

NORTHAMPTON. — ST. CRISPIN writes: "Kindly give some particulars about the construction of a tar-macadam road. Is it superior to ordinary macadam? What are the prices of each?"

The construction of tar-macadam roadways is fully described on p. 613 of "Specification No. 4." As mentioned, their only advantage over ordinary macadam roadways is that, being non-absorbent, they can be easily cleansed, they are more free from dust and mud, and effect an economy in watering and scavenging. The cost of tar-macadam roadways varies from 2s. to 2s. 6d. per yd. super., exclusive of the foundation. Ordinary macadam costs, on an average, about 11d. per yd. super.

Value of an Invention.

BLACKBURN.—CARBON writes: "What would an invention be worth that could be fitted up for about 10s. per room and would cause a fire to give 50 per cent. more heat and always burn better, absolutely prevent draughts, and give greater freedom from dust?"

Inventions relating to firegrates are multitudinous, and the majority of them never get beyond the Patent Office. Some persons seem to think that when they have secured a patent their difficulties are over; but they are only just then beginning, for it is in getting manufacturers or others to adopt inventions commercially that the difficulties occur. From the indefinite statement given us by "Carbon," it is impossible to estimate the value of his invention; it may be of value, or it may be an idea which has been patented already—perhaps many times, in modified forms. Even assuming it is a good invention, one cannot estimate what it would be worth; for that depends so largely on the firm to whom it is offered and the business capability of the inventor. It is worth just what he can get for it. If "Carbon" wants to ascertain the value of his invention, he had better patent it and then approach those likely to adopt it; he will soon find out then.

Horace Walpole's Villa at Strawberry Hill.

Southport.—F. H. C. writes: "Is Horace Walpole's villa at Strawberry Hill still in existence?"

There is a house at Strawberry Hill, near Twickenham, still standing which is known either as Pope's or as Walpole's villa. It is occupied by Mr. Labouchere. G. A. T. M.

The Term "Gothic."

Southport.—F. H. C. writes: "Evelyn, in his diary, under date 3rd January, 1666, uses the word 'Gothic' as applied to Nonesuch House. We are usually told that the word arose in the eighteenth century, and was applied to mediæval buildings as a term of reproach. In what sense does Evelyn use the word?"

I believe that the term "Gothic" was first used in the disputes in Parliament as to the design to be adopted for New St. Paul's, just about the date named by our correspondent (1666) and as a term of reproach.

G. A. T. M.

R. I. B. A.

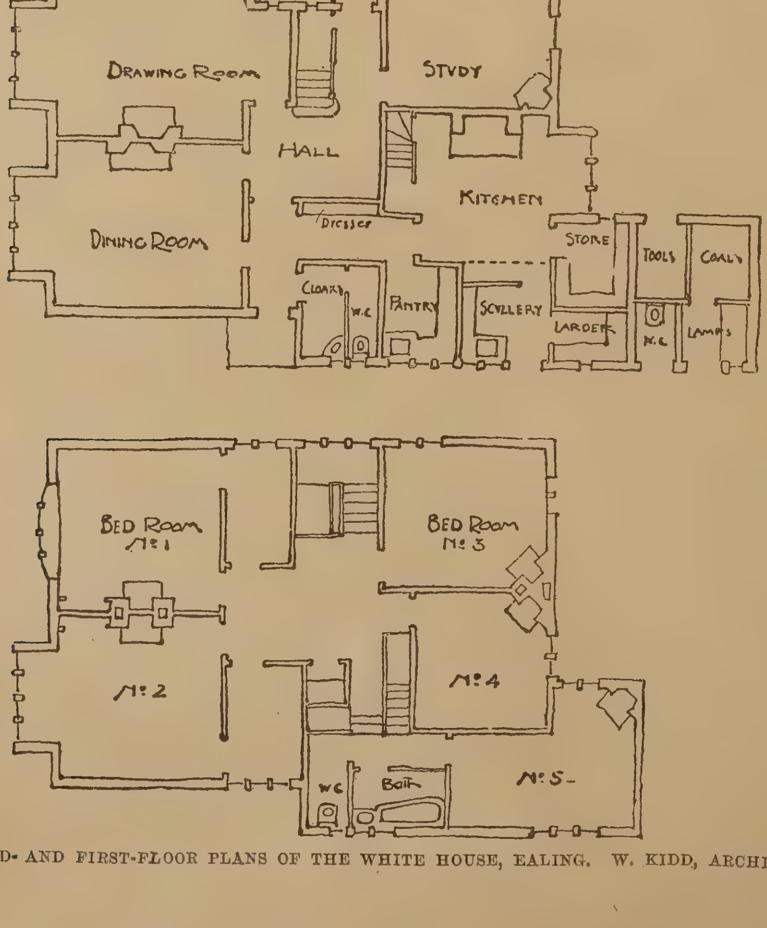
GRECIAN CAPITALS.

A MEETING of the Royal Institute of British Architects was held last Monday evening—Mr. John Slater, B.A., vice-president in the chair. Mr. Alexander Graham, hon. secretary, having announced the decease of Mr. Edward Henry Martineau (Fellow), Mr. Hugh Leonard (Hon. Associate), and Mr. Edmund William Smith, (Hon. Associate), Dr. A. S. Murray, of the British Museum, read a paper on "Two Ionic Capitals in the British Museum." In his opening remarks Dr. Murray said that Professor Meurer, of Rome, visiting the Museum some months ago, identified one of the Ionic capitals in the collection as from the Temple of Wingless Victory at Athens. It was an angle capital from the south-west angle, and was brought over by Lord Elgin, together with some slabs of the frieze. The temple had four Ionic capitals at each end—none along the sides; hence, probably, the later name of the temple, Wingless Victory. The official name was Athena Nikè, which was definitely confirmed some years ago by the finding of an inscription, on marble, in the form of a public record ordering the building of the temple, stating that the designs were to be left to Callicrates, whose name is familiar as one of the architects of the Parthenon. The date of the inscription is agreed to be not earlier than 450 B.C., but not much later—that is to say, about ten years before the completion of the Parthenon. It does not follow, however, that the work had been put in hand at once. There is another inscription added on the same slab obviously some years later, about 430 B.C. Accordingly, between these two dates, 450–430 B.C., the temple had been built. At the latest it is therefore older than the Erechtheum. In the Elgin Room at the Museum can now be studied an angle capital of the Erechtheum side by side with the newly-identified capital of Athena Nikè. The capital of the Erechtheum is exuberant in its beauty; the other is simplicity itself. There is in the museum a fragment of an angle capital of the Ionic Order from the temple at Bassæ by Ictinus, the colleague of Callicrates in the building of the Parthenon. It would be satisfactory if the newly-identified capital could be claimed positively as the work of Callicrates. The Bassæ fragment, however, Dr. Murray considered both simpler and grander in its lines; and there was still the question whether the commission given to Callicrates about 450 B.C. for the Victory temple had ever been executed by him. Incidental reference was made by the author to a curious small terra-cotta capital, archaic Ionic, obtained from Gela, in Sicily, two or three years ago.

He next referred to the Ionic capital from the archaic temple of Diana at Ephesus, described in his paper on "The Sculptured Columns of the Temple of Diana at Ephesus," read at the Institute in 1895. To a large extent this was a reconstruction from fragments of the old burnt temple found under the later one, and fortunately those fragments were enough to enable the reconstruction to be made without recourse to much conjecture. But there remained over some other fragments of capitals from the same archaic temple. As they lay in the museum room they were almost unintelligible. After much doubting he (Dr. Murray) decided to take certain of them in hand, and pieced together the fragments; the result being a restoration, fairly justified by the remains, of an archaic capital of an entirely new character.

There remain two fragments from the archaic temple at Ephesus which the author thought must also belong to a capital, one showing the head of an ox in very high relief; the other, part of his back and haunch, with the tail thrown up over the haunch; if he were right in his assumption, we have thus at least three types of capitals from one and the same archaic Ionic temple. We have also at least three types of bases, and, considering how few are the surviving fragments, no one can say but there may have been other varieties. Pliny says of the later temple that thirty-six of the columns were sculptured. The older temple also had sculptured columns. These enriched columns would be capable of carrying off some variety in the capitals. The moral is that if the architects of the Classical Revival in this country had been aware of the inventiveness of the early Greeks the aspect of our towns would have been very different.

Mr. Hugh Stannus, F.R.I.B.A., then showed and described some photographs of the temple of Athena Nikè and of its capitals which went to prove the identity of the first capital described. Messrs. R. Phenè Spiers, Paul Waterhouse, Beresford Pite, W. D. Caröe, W. Brindley, E. W. Hudson and John Slater also spoke.



GROUND- AND FIRST-FLOOR PLANS OF THE WHITE HOUSE, EALING. W. KIDD, ARCHITECT.

Views & Reviews.

Manchester Cathedral.

There is a sort of incongruity about Manchester Cathedral. The quiet secluded surroundings which we are wont to associate with our cathedrals are absent, and the business premises which take their place repel the visitor and make him wish it were otherwise. Moreover, the exterior of the cathedral is itself by no means imposing, and, without transept or central tower, its appearance is more that of a large parish church. But the great interior, dimly lighted, somewhat compensates for this deficiency, affording many signal impressions and containing details of considerable interest. This book deals with the cathedral in much the same manner as the rest of the same series, beginning with a history of the building and then describing in detail the various features; while the latter portion of it is devoted to the collegiate buildings now known as Chetham's hospital and library, recently the subject of an illustrated article in our own columns.

"The Cathedral Church of Manchester," by the Rev. Thomas Perkins, M.A. London: George Bell & Sons. Price 1s. 6d. nett.

Reading Abbey.

This book will be of more use to the archæologist than to the architect, for the latter will not be much interested in reading about "The Martyrdom of Hugh Faringdon," "The Struggle between the Abbot and the Guild Merchant," the books in the library, and the endowments, revenues, armorial bearings, seals and coinage of the abbey. The dimensions and particulars, however, of the various buildings may prove useful to some persons, but they savour rather of archæology than of architecture. Reading Abbey is to-day an ivy-clad ruin, for "so complete has been the work of destruction that little remains beyond portions of the north and south transepts." The inner gateway is the best preserved portion, and of this we are told that it "forms a beautiful specimen of mediæval architecture in a comparatively complete condition"—though, as the next sentence informs us, "its restoration was carried out in 1861 by the late Sir G. Gilbert Scott, some carvings which had been postponed for want of funds being added in 1900."

"Reading Abbey," by Jamieson B. Hurry, M.A., M.D. London: Elliot Stock, 62, Paternoster Row. Price 15s. nett.

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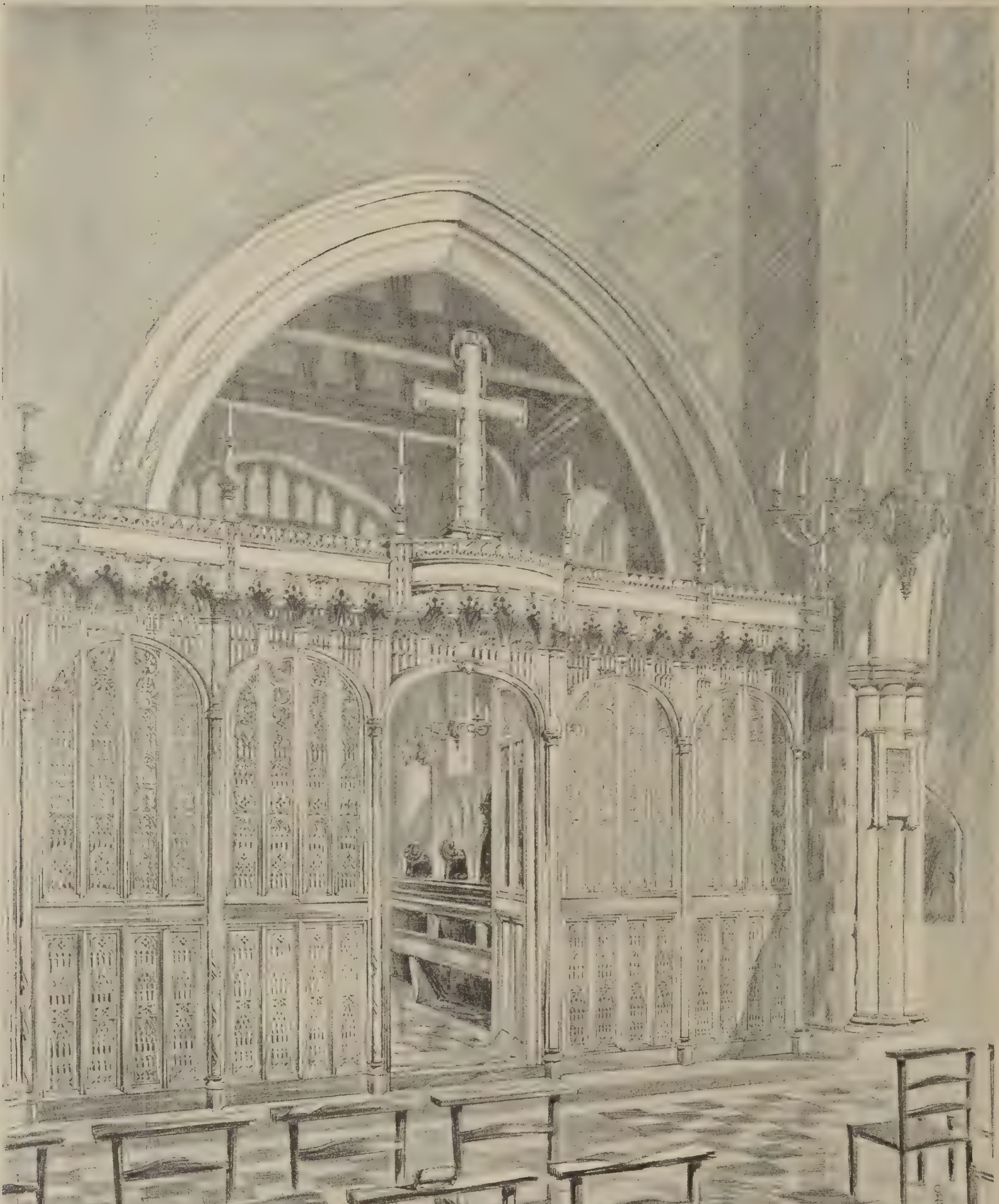

ROOD SCREEN CRANFIELD CHURCH
BEDFORDSHIRE, AS PROPOSED TO BE REPLACED.

MALLOWS & GROCOCK
ARCHITECTS. BEDFORD.

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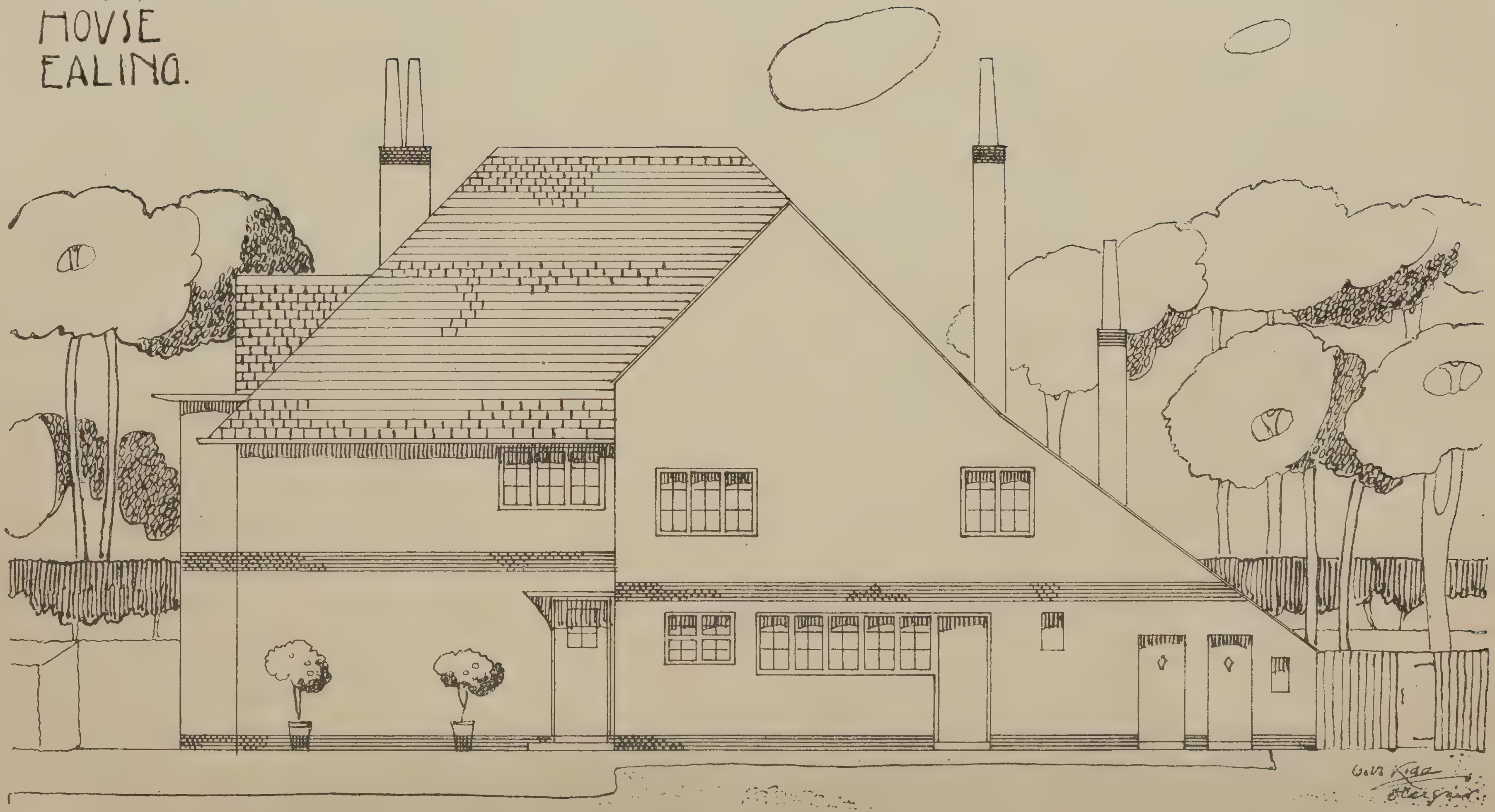
THE WHITE HOUSE EALING.



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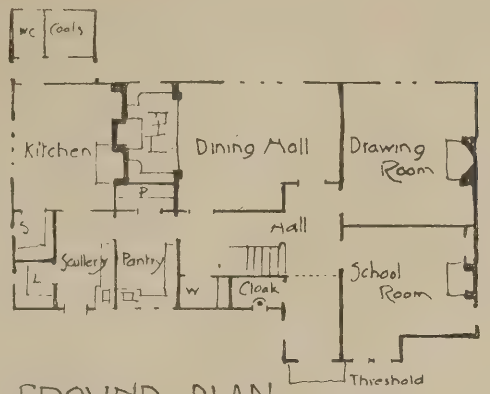
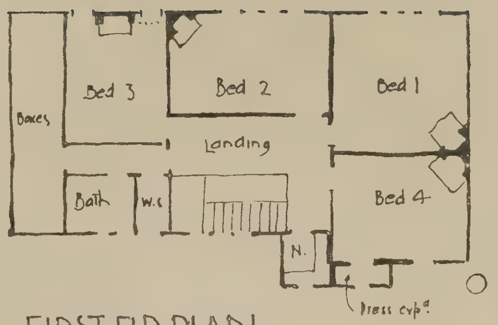
PROPOSED COUNTRY HOUSE

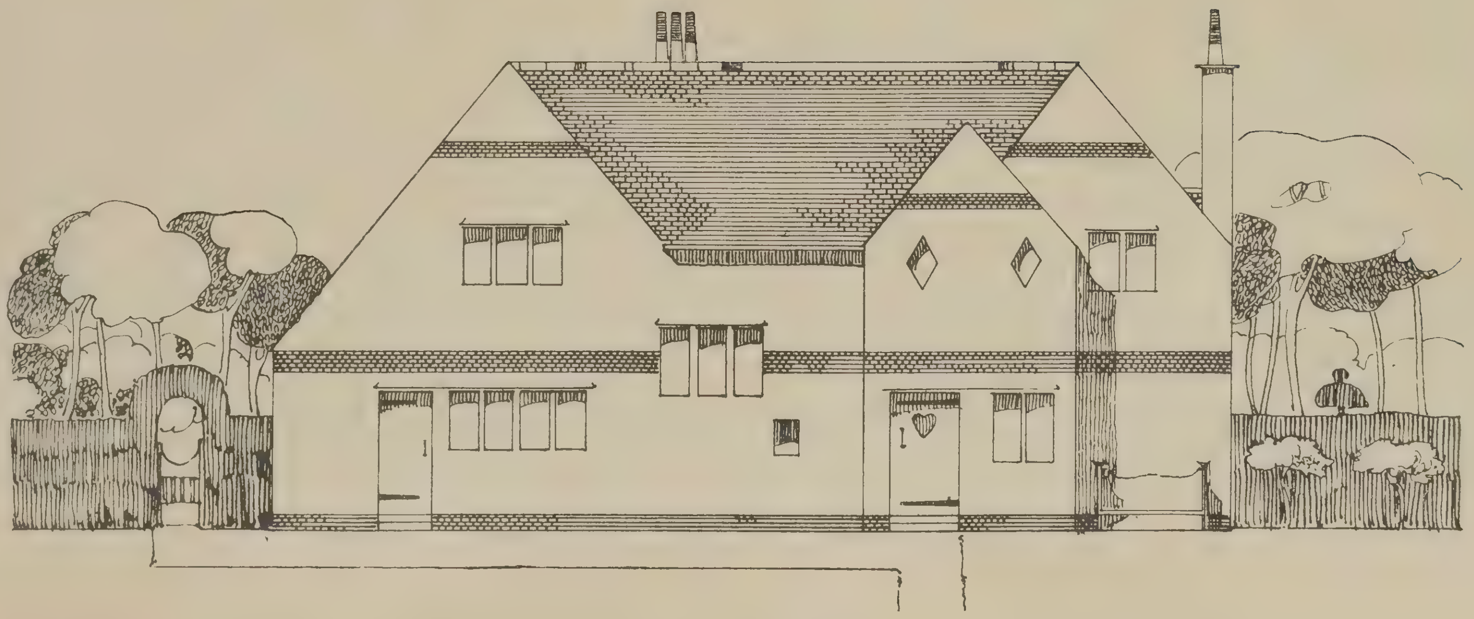
Will Kidd xii 01.



GROUND PLAN



FIRST FLR. PLAN



SKETCH OF FRONT

49 Elm Park Mansions
Chelsea.

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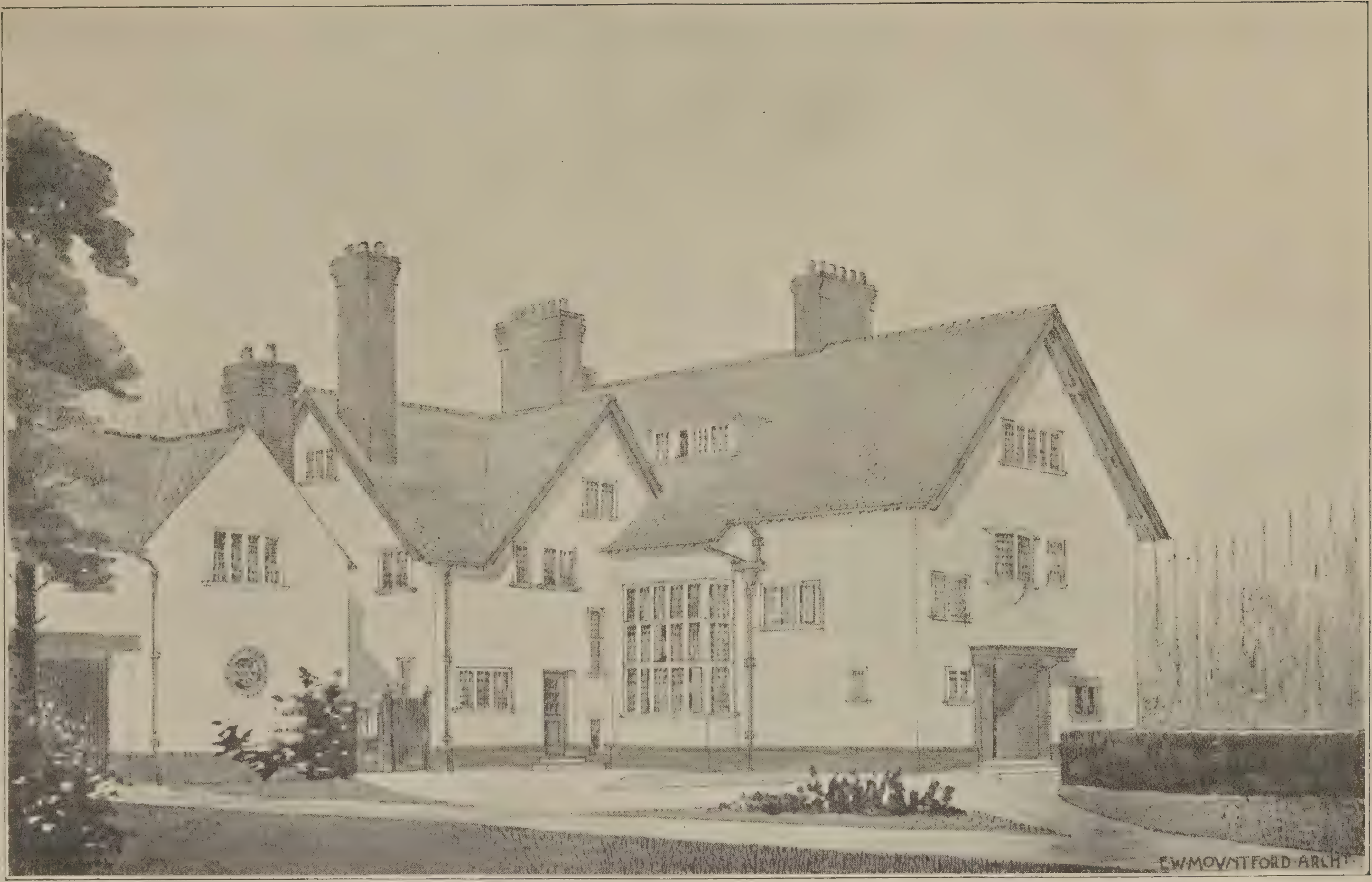
E.W. MOUNTFORD ARCHT.

HOUSE AT MUNSTEAD, NEAR GODALMING. E. W. Mountford, F.R.I.B.A., Architect.

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THE BUILDING TRADES IN 1901.

THE building trade during the past year has been very depressed, due to the war, the scarcity of money, and the high price of materials. Speculative house-building has been much hampered, although this does not apply particularly to London and environs. Reports from all over the country record a marked decline in business; and it is doubtful whether much of the work held back early in the year, owing to the high prices of materials and labour, will now be executed. It is strongly felt by employers that the present high rate of wages is no longer justified by the state of trade, but the long notice which has to be served prevents any general attempt to effect a reduction. Leeds employers have, however, submitted a proposal to the bricklayers for an alteration in the winter working time-sheets, the notice as to which expires on April 30th. The Board of Trade memorandum shows that among carpenters and plumbers throughout the country 3·5 per cent. were unemployed in November. In Leeds stonemasons report a slight improvement, but other branches are quiet Employment is fairly good in York and Darlington, but moderate or quiet at Middlesbrough, Stockton, Bolton, Bath and in North Wales; and generally dull on the Tyne and Wear, in Scotland, in Bradford, Huddersfield, Manchester, Liverpool, Nottinghamshire Birmingham and Bristol. In all probability there will in the new year be large migrations of operatives.

England and Wales.

Blackpool.—The borough surveyor of Blackpool (Mr. J. S. Brodie) in his annual report points out that during the past year there has been a reduction in the number of houses erected in the borough, the 370 houses erected showing a decrease of fifty-nine over the previous year. During the year the Corporation instituted legal proceedings for breaches of the by-laws in twenty-nine cases, and were successful in twenty-five.

Colne.—The building trade here is active. The new free library, public hall and technical school is nearly finished. An expenditure of £13,000 for these buldings has been authorised, and the contracts already completed or in progress amount to £10,000. Gas, water, electric lighting, markets and abattoirs are in the hands of the Corporation, and represent a very important part of the town's assets. Under an Act passed in 1897 the town council obtained power to borrow £100,000 for the purpose of improving the water-supply, and £30,000 has already been expended in the purchase of land at Wycollar, where boring operations are in progress. The electric-lighting scheme is approaching completion, and will cost about £39,000. In it provision is made for supplying motive power to the light railway which Messrs. Greenwood & Batley, of Leeds, are about to construct through the town. At the markets during the summer £10,550 has been expended upon extensions. The sewage problem is pressing for solution here as everywhere else, and in the Local Government Board Offices there is at present an application from Colne for leave to borrow £11,000 for bacteria beds. The town council also propose to erect public baths and wash-houses; and a fire brigade station and stables are to be erected. An isolation hospital is also proposed.

Coventry.—The building trade here during the year may be described as quiet. There has been no immediate need of houses. The city engineer (Mr. J. E. Swindlehurst) in his report states that in the eleven months plans were approved of 414 buildings—a number much below several previous years, even when full account is taken of the shorter period; and the buildings completed were 482.

Huddersfield. — Building has been much checked here during the past year by the high wages and costs of materials. No new large buildings have been commenced, and the prospects for this year are not bright.

Hull.—The only work which is keeping firms going is building new premises in the new streets; the erection of four board schools, and the extension of four others; and the work of extension and repairs generally. It is stated on good authority that over 3,000 houses in Hull are unoccupied.

Leeds.—Speculative building fell away at the beginning of 1901, and there is no sign of a distinct revival. In Leeds there have been nearly 2,000 houses erected since January, but this is several hundreds less than in 1900. The number of plans deposited was 3,211. Forty-seven important contracts have been practically finished. Between seventy and eighty big jobs are in hand, including the Roman Catholic Cathedral, the School of Art, the Women and Children's Hospital, several factories and warehouses, an extension of the Corporation electric-lighting works, and churches and chapels, as well as new shop premises and the rebuilding of several hotels. Among the contracts yet to be placed is that for the building of a large engine shed for the North-Eastern Railway Company.

Newcastle.—With the termination of the dispute in the local building trade a great increase of activity set in during the early part of the year, and being continued, the work in the hands of leading firms has been upon a more extended scale than for some very considerable time past. Business premises in the heart of the city, schools and churches on the outskirts, and the steady occupation of the few remaining available sites for dwelling-houses, caused an abundance of employment, and in not a few cases the supply of materials has failed to keep pace with the demand, the result being delay in construction.

Sheffield.—During the past year the building trade has been prosperous. The number of plans deposited with the city surveyor for approval (as complying with the by-laws) has been 1,452. In the preceding twelve months the number was 1,425. There was thus an increase during 1901 of 2 per cent., though the total is practically the same as that for 1899. This year promises to see continued prosperity.

York.—The past year has been active in building operations, and the prospects for this are good.

Scotland.

Aberdeen.—The cutting and finishing of granite in Aberdeen during the past year has, on the whole, shown a marked improvement when compared with 1900. The new century opened somewhat darkly for the majority of the granite merchants, but as the spring advanced a change took place, work steadily increased, and the prospects of further orders are now bright. Most of the leading yards are at present exceedingly busy and, in most cases, have work in hand sufficient to carry them right through the winter. Referring to the home trade, there has been more work done in Aberdeen during the year than in 1900. Perhaps the most noteworthy feature has been the still further development of architectural work in granite. The demand for polished granite fronts in London and the large principal towns has not within the past year been quite so great perhaps as before the outbreak of the war, but nevertheless the local quarries have been unable to cope with the demand for stone for building purposes, while the amount of imported granite used has been greater than ever.

The operative mason trade during the past year has been fairly good, showing, as compared with the previous year, a considerable improvement. On the other hand, the results are far from being up to the standard of 1899 and years immediately prior to that. In the building branch there have been, on an average, between 800 and 900 men steadily employed during the year; while in the monumental branch upwards of 1,100 men received employment. Previous to the end of 1899 the number of men permanently employed in the building branch had also reached to nearly 1,100. The collapse, however, in speculative building accounts for the number having been so largely reduced. Throughout the year the relations between the employers and the operative associations have been of the most cordial character, no dispute of any kind having taken place. The standard rate of wages in the building branch is 8d. per hour, and in the monumental branch 7d. per hour. On these two rates no change has taken place. For the coming year the prospects are good. Unfortunately what is true of the mason trade cannot be said of what might be termed its sister trade—the joiner trade. The year has been a dull one. There was a slight improvement at the term time and throughout the summer, and especially during the past three months, but even now, when work is not so scarce, it is handicapped by the very wet weather which is being experienced. While trade was dull in all branches, especially was this the case so far as building is concerned. This, however, might be accounted for by the fact that the masonwork of many of the larger contracts was not commenced until pretty late in the year. While in December of 1900 there were 842 operatives in employment, at the end of the year the number reached only 700, showing the large decrease of 142 men. The prospects for this year are fairly good. The falling off in the building of tenement houses to some extent contributed to the quiet state of trade, but this was to a considerable extent counterbalanced by the erection of large west-end dwelling houses. Regarding wages, there has been no change in the rate—8d. per hour; and no dispute has taken place between masters and men.

Dundee.—During the past twelve months there has been a gradual abatement of activity in Dundee building trade. There has been little disposition to embark upon purely speculative ventures. The field for enterprise of this kind is, of course, chiefly in the direction of erecting tenement property. Statistics show that about 2,000 houses are unoccupied. Architects, builders and others take a despondent view of the future.

Edinburgh.—There is a gloomy outlook in the building trade of Edinburgh. Many men are unemployed, and there is a lack of important new work in prospect; but, on the other hand, there is a good deal of untouched work for which authority has been asked, and which, no doubt, will be put into operation at the first convenient opportunity. In explanation of the large number of workmen unemployed, it may be suggested that this is a result of the late building boom. Now something like the normal condition of matters has been reached. Speculative work is practically at a standstill, and there are large numbers of unlet houses. In 1900 the number of warrants granted by the Dean of Guild, including minor alterations, was 884, valued approximately at £892,950. These warrants embraced 57 villas, 74 self-contained houses, 225 public and other buildings, 590 alterations, and 82 tenements containing 43 shops and 962 dwelling-houses. In the year up to date there have passed the Dean of Guild 782 warrants for buildings valued approximately at £630,340, a decrease of £199,610 compared with the previous year. This year's programme includes 36 villas, 126 self-contained houses, 148 public buildings, 398 alterations, and 56 tenements of 15 shops and 537 dwelling-houses. More than half the tenements passed during the past year are still unbuilt. The completed work in this department includes buildings for which warrants were passed in the previous year, but not executed until last.

Glasgow.—The building trade in Glasgow has been much less busy than in former years. The trade in cast-iron pipes has been a large one and shows signs of continuing. The light castings trade has, however, not been so good as in the preceding two or three years, and the outlook is not promising.

Johnstone.—The year 1901 in Johnstone has been marked by steady trade progress. Engineering and tool-making have been fully maintained, and the volume of business has borne testimony to the continued activity and trade of Johnstone. There have been about sixteen important new buildings put up inside the burgh. Building prospects are not quite so bright for this year, although several public buildings are proposed.

Kirriemuir.—Building trades still remain dull and lifeless, with but little appearance of improvement. Not a single dwelling-house has been erected in the burgh during the summer, the work done being exclusively confined to the country. It is not that dwelling-house accommodation exceeds the demand. The causes assigned are the want of building-sites, high cost of materials, and local taxation, so that dwelling-houses cannot be erected to pay.

Leith.—A report on the building trade in Leith during 1901 issued by Mr. Beatson, burgh surveyor, states that throughout the past twelve months there was an absence of that briskness which characterised the trade in former years. The prices of building materials reached such a height that the erection of new property, especially tenements by speculative builders, was considerably checked; and though prices have now fallen, it will be some time before this branch of the trade recovers. The prospects of improvement in the building trade are not satisfactory.

Lossiemouth.—The building trade promises to be fairly active this year. Several new public and large private buildings are being commenced, and the supply of dwelling-houses is far less than the demand, even although a considerable number were erected during the past year.

Musselburgh.—There has been a considerable slackening in the building "boom" which has prevailed in Musselburgh for several years past; although the number of applications before the Dean of Guild Court has been larger than usual.

New Patents.

The following patents are open to opposition until February 11th.

1900.—Drain Cleaners.—22,113. G. ROSE, 13, Sussex Terrace, Brighton. For clearing away an obstruction, a spiked cast-iron ball (in two halves) is mounted on the end of a spindle attached to an Archimedean screw, which is rotated by means of a length of rope. Discs of rubber, or brushes, can be attached for the purposes of cleansing the drain.

Lifting Appliances.—22,245. W. R. GREEN, The Retreat, Queen's Road, Peckham, S.E. To enable goods to be handled with safety, a chain or rope barrel is loosely mounted on a shaft and driven through a clutch. Pawls are arranged to hold the load suspended, but instead of being mounted on some fixed part of the framing they are pivoted to a break sheave normally held by a strap or weighted lever. To lower the load the brake is released, allowing the drum and break sheave to revolve together.

Glazing Bars.—22,499. D. J. JARVIS, Humberstone Road, and J. W. WADKIN, 49, Mere Road—both of Leicester; and T. S. KING, 8, Old Heath Road, Colchester. The glazing bar is made of wrought iron covered with lead or other similar yielding material. Flaps are provided at each side of the central web which can be bent down on to the surface of the glass.

1901.—Cement Kilns.—801, J. S. RIGBY, 26, Bagot Street, Wavertree, Liverpool. In order to more effectively prevent the iron or steel kiln body, or its lining, being corroded or destroyed by the action of the heated material or clinker, those parts of the kiln subjected to the greatest heat are cooled by a water jacket; or in some cases the entire kiln may be jacketed.

Double-Acting Saws.—8,737. G. R. PEART and F. FOXON, Union Saw Mills, Charles Street, Sheffield. The saw has its teeth formed in pairs, each facing opposite directions and set right and left. The object is to avoid the sawgate becoming clogged with sawdust and to facilitate sharpening.

The following specifications were published on Saturday last, and are open to opposition until February 18th. The name in italics is that of the communicator of the invention. A summary of the more important of them will be given next week.

1900.—22,780, JARVIS, WADKIN & KING, glazing bars.

1901.—97, BECK (*Sloss*), valves. 517, CANDY, apparatus for treating sewage. 1,382, ALBRECHT, coupling pipes or cocks to mains, &c. 1,631, POCHIN & POCHIN, stone-breaking machines. 2,109, RUELLE & MONTAGNE, smoke-consuming apparatus for furnaces. 2,136, WILD & RIGBY, guard for wood-planing and similar machinery. 2,409, RIISAGER, manufacture of Portland cement. 2,848, SAVAGE, brackets for hanging shelves. 2,928, BENSON, structures of corrugated metal. 3,106, POTTER, floor cramp. 3,777, LIPMAN, adjustable supports for book shelves. 3,896, WILLIAMS, draught and dust excluders. 6,001, DUFOUR, cooking ranges. 10,696, WALLIS & LAGERWALL, roller mills for the manufacture of paint, &c. 18,017 RADCLIFFE & PUGH, joints for pipes under pressure. 20,675, KUNZ, concrete mixing machines. 21,197, DARLINGTON, means for ventilating buildings. 21,463, BEINHAUER, jointing of pipes. 22,809, WICKSTEED, drill rachet braces.

Correspondence.

Alabaster.

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—When a correspondent wrote recently, "Where can I procure a good quality of alabaster?" no doubt his query was somewhat ambiguous. But the reply, giving the names of foreign alabasters that are seldom seen or even heard of in this country, was not, in my opinion, satisfactory. None of the fourteen varieties mentioned can be obtained save in disappointingly small blocks and at ruinously high prices; hence none of them find any favour in the eyes of even high-class statuaries, still less in those of builders.

The practical answer to the question is that the alabaster which is used so largely for the interiors of our cathedrals, churches and more important public buildings, is entirely English, procured principally from Derbyshire and Staffordshire. It is obtained in large well-squared blocks (anything up to 22ft. to 25ft. long), and its cost, put on truck at the nearest railway, averages 70s. a ton for the coloured variety and 80s. for the pure white. The latter is somewhat scarce, but is, from its size, infinitely preferable to the Italian variety for all architectural statuary work. The English white is procurable in good, large, economically-squared blocks, whilst the foreign is of all sorts of shapes, never squared at all, and it is seldom that any one of these most disappointing boulder-looking blocks contains more than 2ft. cube, cut them as one may. Where so many suppliers of excellent English alabaster exist, it is somewhat invidious to mention individual quarrymen in this material, but no harm can be done in quoting Messrs. Peter Ford & Sons, of Uttoxeter, and Mr. R. S. Lomas, of 37, King Street, Derby, as amongst the best-known suppliers in the trade.—Yours truly,

HARRY HEMS.

The Eleanor Cross near Northampton.

To the Editor of THE BUILDERS' JOURNAL.

WEST HILL, KETTERING.

SIR,—The Eleanor Cross at Hardingstone, near Northampton, has been undergoing inspection by the Northamptonshire County Council on the occasion of its passing into their possession. The scaffold which has been erected will remain in position for a week or two longer, and an excellent opportunity is thus afforded for measuring the whole structure, provided the weather is not too severe. The County Council would be glad to possess a good set of drawings; and if any student cares to takes this opportunity of measuring a subject which has not yet been properly undertaken, I shall be glad if he will communicate with me as soon as possible.—Yours truly,

J. ALFRED GOTCH.

"Building Construction."

To the Editor of THE BUILDERS' JOURNAL.

DUBLIN.

SIR,—In the article on building construction published in your issue for December 18th the author states that he does not object to criticism. I should like to be enlightened on the meaning of some, to me, strange technical expressions. What is the meaning of a "plat-band arch"? What is the meaning of *raked* rubble masonry? There also appears a quaintness about the expression "purchased" quoins, sills, &c. Surely the builder "purchases" the other materials as well!—Yours truly,

PUZZLED.

"Puzzled" will find "plat-band" in Parker's "Glossary of Architecture" and in Weal's "Dictionary of Terms"; he will also find "plat-band arch" in the Imperial Dictionary (Gresham Publishing Co.)—"(*b*) a lintel formed with voussoirs in the manner of an arch, but with the intrados horizontal." Fig. 82 leaves little room for being puzzled in respect of what is meant by the term; but it seems that "Puzzled" is under suspicion of being the kind of critic excluded in the invitation. If our contributor is to deal with actual buildings he must for each building be local; just now he is Irish, and he is dealing as exclusively as he can manage with hammer-dressed rubble. Owing to the great variety in building stones, it is exceedingly difficult to define hammer-dressed rubble masonry in terms that will apply universally. In the north of Ireland (certainly in Londonderry and Antrim) the term "raked rubble" is used by the workmen. Mr. Smith, from whom our contributor quoted, wrote for the local trade of Belfast. The masons referred to work "whinstone," which is in many respects a good stone; but just because it is a difficult "rubble" stone the men who work it are probably the most expert rubble masons to be found, and it is on this account our contributor referred to their work and gave their name for it. The substitution of Portland cement for rich lime in rubble masonry mortar alters the character of rubble masonry from being a weak masonry to being a very strong masonry, and it is sought to emphasize this. "Purchased" should of course be "punched"; and instead of 22½ bushels to a cub. yd. read 21 bushels.

Manholes and Sewers.

To the Editor of THE BUILDERS' JOURNAL.

GODALMING.

SIR,—Allow me to supplement the information given under this heading on p. 350 of your last issue. The manhole chamber itself at the invert level should be at least 4ft. 6in. by 3ft., and at least 6ft. to the soffit of the arch crown. The shaft from the chamber to the surface need be only 30in. square. If the manhole chamber is circular, it should be of 4ft. 6in. diameter at the invert level, tapering to less above if required.—Yours truly,

J. HERBERT NORRIS.

Engineering Notes.

The Union Offices, Todmorden, are being fitted with the latest improved hot-water heating apparatus by John King, Ltd., engineers, Liverpool, who are employing their "Rahnee" radiators and "Rex" radiator valves.

Municipal Lighting for Norwich.—The Norwich Town Council have decided to purchase the business of the Norwich Electric Lighting Co. The price asked was £19 per £10 share, and the total amounts to about £214,000.

Collapse of a Bridge in Ireland.—One of the tunnel bridges on the Belfast and Bangor Railway fell in recently. Happily the accident was not so serious as was at first anticipated. The bridge affected was near Craigwood. No one was injured.

The Construction of the Cape to Cairo Railway northwards from Buluwayo towards the Zambesi river, a distance of approximately 300 miles, has already been commenced. To carry the railway over the gorge through which the Zambesi flows a short distance below the Victoria Falls a bridge is proposed. Sir Douglas Fox & Partners are the engineers of the railway, and their design for the bridge shows one span of 600ft. in length and at a height of 400ft. above the water. Victoria has a fall of 400ft., and Niagara a fall of less than 170ft.

Electric Lighting at Shrewsbury.—In order to meet the increasing demand for electric light in Shrewsbury, the town council have several times been compelled to extend the machinery during the four years the undertaking has been in their possession. The latest of these extensions has included the erection of a new engine. The new set of machinery is of 350 brake horse-power, and the dynamos are of 242 kilowatts capacity, capable of supplying 4,000 16-candle power lamps burning at one time. The engine was manufactured by Messrs. Bellis & Morcam, Birmingham, and the dynamos by Messrs. Thomas Parker & Co., Wolverhampton. The estimated cost was £2,650, and the work has been done to specifications supplied by the borough electrical engineer, Mr. C. M. Johnston.

BUILDING CONSTRUCTION.

(Continued from p. 336, *No.* 359.)

CARPENTER AND JOINER.

68. FIG. 87 shows a collar-braced roof. The wall-plates, 4½in. by 3in., are bedded on the side walls at the inside face; the wall-plate should be tied to the gables; pieces of old cart-wheel tyres bent up at the two ends should be built into the gables, and the wall-plates should be laid upon them. It is sometimes necessary to tie the wall-plates down by building iron hooks into the walls, the hooked tops of which will catch the top of the wall-plate, but this is hardly necessary for the house we are dealing with. The usual spacing for rafters, joists, &c., is 1ft. from centre to centre. A rafter is placed over the gable to be within, say, 6in. of its outer face. The drawing shows the rafters as running from the outer face of the side wall where they show to the ridge-piece; they are spiked to the wall-plates and to the ridge-piece. Care is to be taken that the ridge is level and that the roof surfaces are true and without twist. Twist is easily detected by looking along the top edges of the placed rafters; the ridge-piece is 9in. by 1in., and the rafters and collars are 4½in. by 1½in. The collars are nailed on, and care is taken to have the bottom edges of the collars all truly level and in one plane—they are to serve for ceiling joists. The collar braces should be lightly sunk and shouldered to the rafter (about ¼in.); the rafter should not be sunk for the brace. A collar-brace acts as a strut if the feet of the rafters are fixed, but it is a tie if it is depended upon to prevent the roof spreading. We have provided for tying the wall-plates to the gables; the lengths between gables are short, 11ft. and 9ft.: having regard to the tying of the rafters together with the "battens" and the lathing and plastering for ceiling, it may be assumed that the feet of the rafters are fixed. Where the distances between gables are greater I use strap-iron bracing on the rafters, one V-shaped brace having its ends near the ridge; the point of the V may come as near to the eave as ever we like. The ridge-piece helps the battens to sustain the thrust (taking the side of the roof to be a girder). The brace is fastened to each rafter with a screw. This is not a usual mode of strengthening a roof, but if followed it will be found to be effective.

If the stress on the collar-brace is a thrust, there is is no need to sink the rafter for a dovetailed end on the brace; and if it is a pull the rafter should not be weakened at this point; in neither view is it wise to sink the rafter. The braces are well nailed against the rafters and the nails clenched. Fig. 87 shows a rafter in position, with cross-sections of wall-plate battens 3in. by 1in., and ridge-piece. Battens are sometimes only ¾in. thick, but this is a mistake; they should be not less than 1in. thick, to give sufficient hold for the slating nails.

The student should note that the word "batten" also means a piece of timber 7in. wide, as distinguished from "deals" 9in. wide and "planks" 11in. wide. In some places slater's battens are called slater's laths, and similar things are called laths when used to support tiling. Again, when battens are employed to carry laths to support plaster free from the walls, they are in some places called "studding" and in other parts "stoothing." ("Stoothing"—which I once saw put as a question, "What is stoothing?"—appears to be a local way of pronouncing "studding.")

The rafters being set up spiked to wall-plates and ridge-piece, the slater's battens are nailed on to the *gauge* of the slates to be used, having also regard to the commencement at the eave and finish at ridge. The nailing-on of these pieces is where the carpenter and slater meet—is it the work of the carpenter or that of the slater? I believe it to be the work of the slater, because he is responsible for the lap of the slates, and this is determined by the length of the slates and by the gauge to which the laths are put on.

The rafters for the lean-to are spiked to wall-plates on both walls, as shown. A small beam, 7in. by 3in., 9ft. 6in. long, will carry the shed eave.

The floors of the bedrooms are of ¾in. flooring boards on 3in. by 1½in. joists; the joists are laid on the concrete, kept ½in. over it by 1in. by ½in. laths, placed about 4ft. apart. The joists having been spaced (1ft. apart centre to centre) and levelled, keep them in position by tacking a board temporarily across them; the joists to run the long way of the floors.

The timber for these houses will be supplied altogether from spruce (white) deals, planks or battens.

69. The flooring boards are not tongued and grooved; they are of batten width. The lengths are so short that there will be very few beading joints, and they will be "square" (Fig. 88). Care must be taken before ordering timber of all kinds to study the sizes, so as to have as little waste as possible. The lengths of spruce deals, &c., in the yards appear to be in even numbers of feet; as, say, 8ft., 10ft., 12ft., 14ft., &c., up to 20ft. Enquiry must be made of the merchant from whom it is intended to buy as to what he has, and the quality should be examined. Sometimes it will be found necessary to sacrifice some timber as waste for the sake of getting a better quality than is to be had from more economical lengths. It is advisable to lay the boards with their joints as tight as possible, and for this purpose a pair of flooring cramps may be used. A board is nailed down along the wall, say, of the outer gable (the boards are supposed to be jointed, cleaned and thicknessed; if flooring boards are of different thicknesses the floor will be irregular). Two or three boards are next laid down to continue the floor from the first board, the flooring cramps are made fast to a pair of joists, a straight strong piece of timber somewhat thicker than the boards is laid along the outer edge, and the cramps are tightened up against it, pressing the boards tightly together so that the joints are quite close. The boards are then bradded down (using two 2½in. brads in each board at each joist, driven at about an inch from the joint). The brads should be driven well home, if necessary punched. I do not give a drawing of these flooring cramps. The student should examine the actual tool, notice the clutch action by which it is jammed on to the joist, and the "lifting jack" gearing by which it presses against the boards to be tightened up.

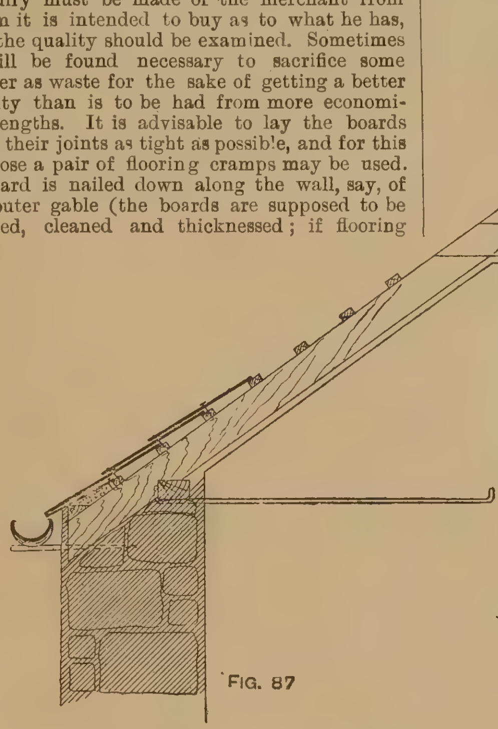


FIG. 87

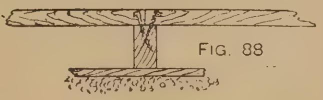


FIG. 88

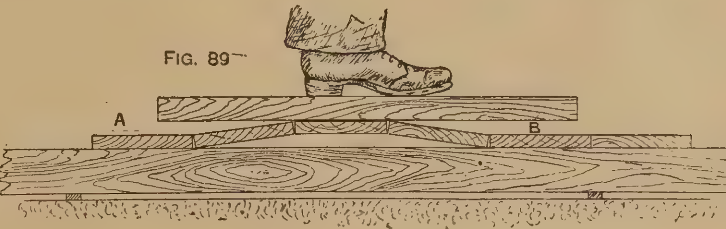


FIG. 89

Toolmakers publish catalogues with very good illustrations of the tools they make or sell; there is usually no great difficulty about getting copies of these catalogues. A great advantage modern architects have over their predecessors is in these numerous well-produced pictorial catalogues. There are doubtless many worthless things invented, and their sale pushed by catalogue advertisement, but the architect is not thus taken in to any great extent. It is a good plan to preserve and file good catalogues: the larger bound catalogues are in almost every-day office use. The firms which at great expense produce and send out these things have no objection (indeed, they much desire it) to their catalogues being intelligently used. Good catalogues should be treated with respect, though many of them are to be had for the asking and many are sent without our asking for them.

Cramps cost from 10s. to 15s. each. These small floors may be laid without cramps by what is called the method of folding (Fig. 89). The board A is nailed down at a distance from B to allow of some tightening; the intermediate boards are placed in position as shown, and the carpenter by his own weight and otherwise presses them down, as shown, when they are bradded to the joists. It is too often the case that the boards of ground floors have joints which remain tight owing to the damp ground which these floors cover. Dampness of site is a much more serious matter in the country than in towns, where the general surface is practically roofed over by macadamized and paved roads, flagged footpaths, yards, &c., and the rainwater is carried off by numerous drains. A point on which I shall no doubt repeat myself over and over again is:—Much of the dampness showing on walls does not come through the walls, but merely shows there because, owing to the damp ground sending its moisture up into the space included within the walls of the house, this space is "saturated"; and at all times when the temperature of the walls is lower than that of the air, moisture condenses upon them. This is the reason why, during a thaw, the walls stream with water. Owing to the concreting of the site of these floors the joints will open, because the boards will dry; there will be sufficient ventilation of the timber through these open joints.

Doors.

70. The front door (Fig. 90) is framed and staved (or framed and filled). The door frame is rebated in the solid, and is set upon door-blocks. The function of the door-blocks is to raise the wood of the door-posts above the ground, because door-posts decay more rapidly at the

ends next the ground than higher up. It is necessary to hold the door-posts fast at the bottom, to prevent them closing. This is sometimes done by sinking a shallow pit in the top of the door-block, to take a short tenon on the post, but it is better to ring (R) the ends of the jambs and drive a spud S (Fig. 90). The ring prevents the post splitting with the spud. The spud enters a hole in the door-block, where it is made fast with some Portland cement. Note—the ends of the posts should be well soaked with drying oil and whitelead paint sometime before setting them on the door-blocks; and because fresh cement in contact with oil-paint turns the oil to soap, it is advisable to prevent the cement used to fix the spud touching the painted end, by putting on a piece of thin Willesden paper like a washer. This is a substantial door, having a head and four bars; it is without bracing. The hinges are three in number—heavy 4in. butts. The door is fastened with a good heavy thumb-latch and a serviceable wooden-cased stock lock. A very great number of the iron thumb-latches made for sale are flimsy and quite unreliable (Fig. 91). The old thumb-latches made by the local blacksmith were strong. It should be remembered that, a door is expected to latch itself when banged to; doors willbe banged, the wind will do it, and they are expected to stand it. The catch A is too trifling, the slope is too steep, and the latch is either bent or the trifling guard B is burst off. The old blacksmiths gave a good long catch A′ with a gentle slope, over which the latch slid without too much friction. The number of latches with slight differences is bewildering; there are many of them bad. Let the student examine the catalogue of a good firm and choose a pattern once for all, and as often as he can let him use this pattern of latch. The plate to which the catch A is riveted is usually too slight, and it will not stand against a good push from without. The student should take a stock lock to pieces, thoroughly examine it, and understand its action. The lock should be fastened to the door with $\frac{5}{16}$in. bolts, and the keeper should be well secured to the door-frame.

The other doors are ledged doors without bracing; such doors had better *not* be fitted to the inside size of the door-frame and the door-frame slipped; they are more satisfactory made to lie against the door-frame (Fig. 92). In this way they have more freedom to "cling" slightly without showing bad fitting. The front outside door (Fig. 90) is to have $2\frac{1}{8}$in. by $4\frac{1}{2}$in. framing top and sides; the bars are $1\frac{1}{4}$in. thick, of the widths shown; and the staving, which is to be tongued and grooved, and let into sides and head, is to be $\frac{7}{8}$in. thick (finished); the joints are to show $\frac{1}{2}$in. beads outside. The other doors are to have 1in. ledges, the sheeting to be $\frac{3}{4}$in. (finished) tongued and grooved; to show $\frac{3}{8}$in. beads both sides; to be well nailed together and the nails properly clenched. They are to have hook hinges, good thumb-latches, and

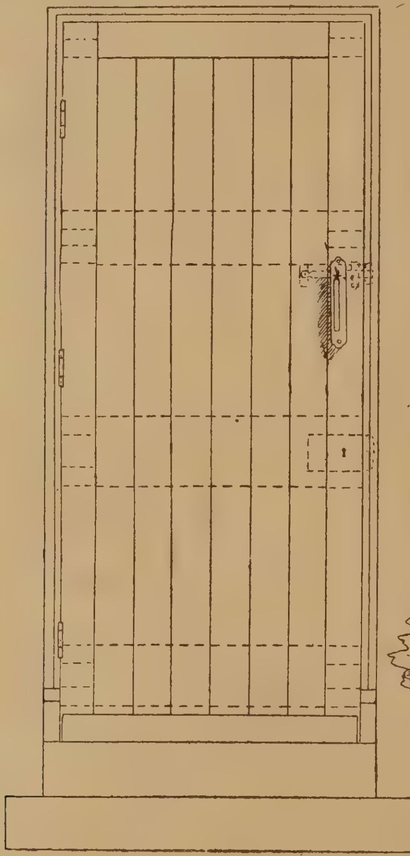
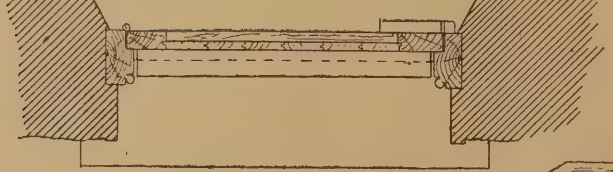


FIG. 90



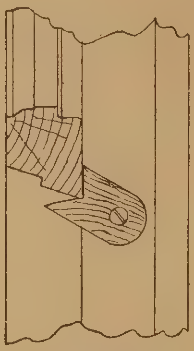
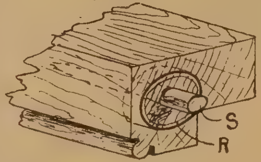


FIG. 98



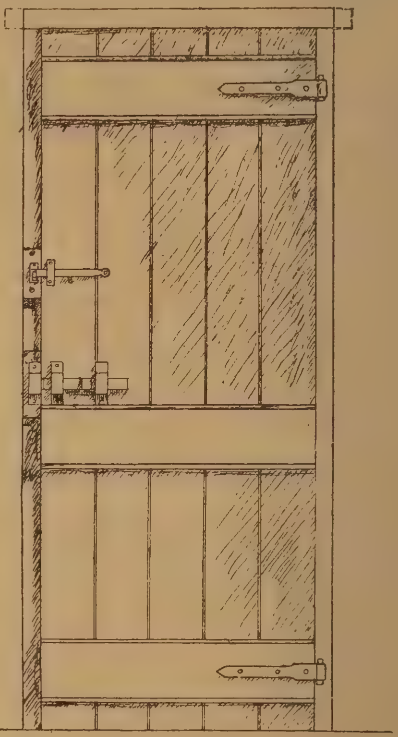
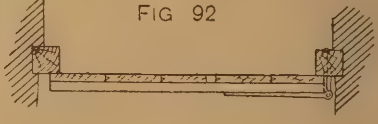


FIG 92



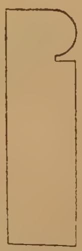


FIG. 95

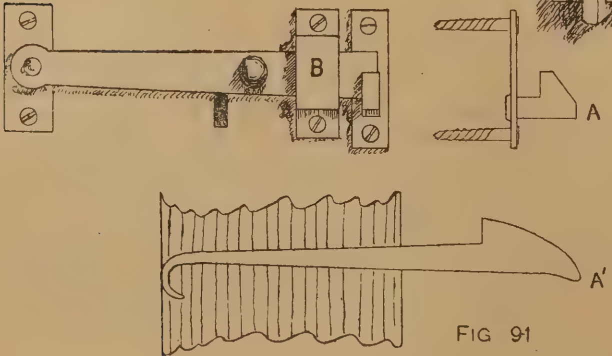


FIG 91

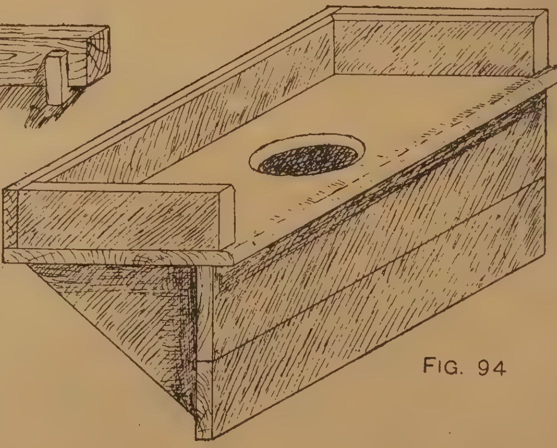


FIG. 94

fastened in every case inside with wooden bars (Fig. 93).

Partitions.

The plan (Fig. 81) showed a partition between the outside door and the kitchen fire. This partition could be brought a little nearer the door with advantage, giving a little more room at the fire, and the outside door should open against the bedroom door. The partition may be made to stand 7ft. over the floor level; it should have a 3in. by 3in. end post, which should be fastened to the outside wall by a cross-piece. If the funds provided would allow of a top to this small hall-way and a second door to the kitchen, the comfort of the labourer and his family would be considerably promoted. As the drawing stands, I would run four bars 3in. by 2in. from the 3in. by 3in. post to the inside gable wall, and on these I would nail ¾in. tongued and grooved matchboarding let into a sleeper 3in. by 2in., having a ¾in. by ¾in. rebate to take the ends of the boards spiked to plugs let into the concrete floor. The upright post should be let into the floor. The bedroom floors should have 4½in. by 1in. skirting, with ½in. bead outside top corner well fastened to plugs, and put on with respect to the finished plastered surface of the walls (Fig. 95).

The privy seats should be made so that they may be lifted out to allow the privy pit to be properly cleansed and to allow the seats to be cleansed and disinfected if necessary. The seat and riser should be made fast with proper brackets, and the seat should rest on pieces properly made fast to the side walls (Fig. 94).

71. There is some difficulty about giving a cheap window that will be satisfactory. It should be weather-tight; it should be available as a ventilator; and it should be easily kept in good order. (*a*) The bottom sash may be fixed, and the top sash may be hinged and allowed to fall back with a quadrant fastener (Fig. 96). (*b*) The sashes may be sliding guillotine sashes having either half fixed and the other half hung with cords, weights, pulley-boxes, and having sash-fasteners. (*c*) Both sashes may be hung. (*d*) The sashes may be hung without weights, one sash balancing the other in a way I have made much use of (Fig. 97). When two sashes are hung on the same pair of suspenders, if the suspenders are too short when the top sash is up the lower sash will not be down upon its sill; if the suspenders are too long when the lower sash is quite down the top sash will not be up. It is therefore necessary, if this mode of hanging is to be successful, to have a means of adjusting the suspender to be exactly of the right length. Fig. 97 shows the pulleys and suspenders which I employ for this kind of window. I have had several hundred sets made specially for me by Messrs. Colledge & Bridgen. They are perfectly satisfactory, but the cost is rather too great; possibly, if they were more generally used, manufacturers could afford to supply them at a cheaper rate. The adjusting screw is at A. For suspenders I have hitherto used Hookham's steel ribbon sash line to fasten the ends. The ribbon is brought through the eyes, it is turned up, bound round with a few turns of tinned-copper binding wire (used by electricians), and the turns of binding wire are soldered together.

Fig. 98 shows a very simple ingenious catch for holding up an unhung lower sash in primitive times, when hanging and parting slips were not thought necessary for windows. Another ingenious old-fashioned catch for holding back an outside hinged shutter might be noted; the hole in the catch is square, and the hook on which it works has a square shoulder, with a round spindle above, which allows it to be turned when lifted above the square (Fig. 99).

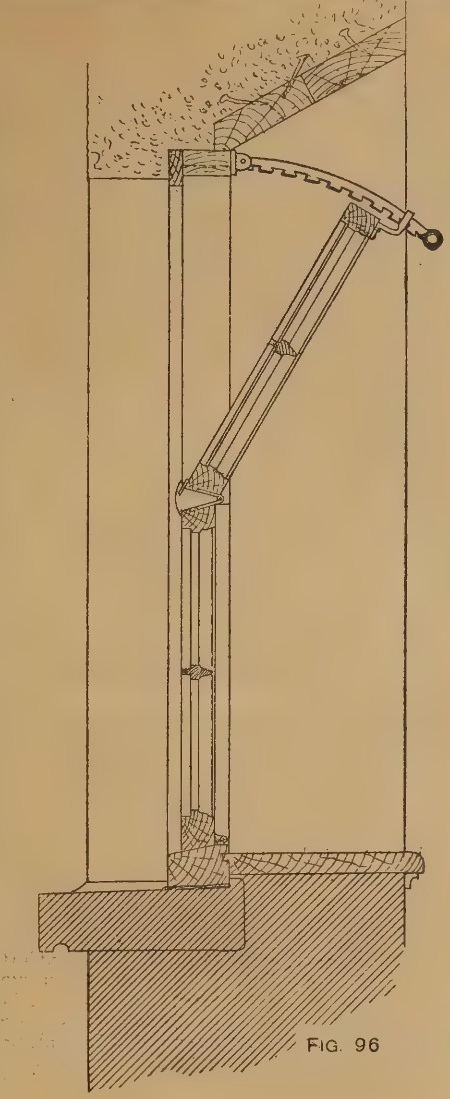


FIG. 96

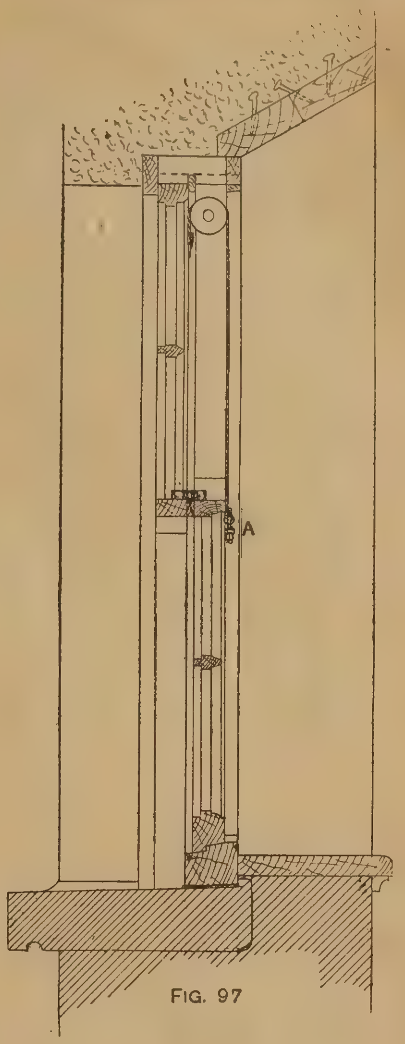


FIG. 97

Architectural students who take an artistic interest in old buildings should note also any mechanical arrangements of this kind which our ingenious predecessors put in common use.

The doors of these houses are not given as model doors. The windows are not to be taken as model windows.

I reserve the general question of windows for the present. The kind of window which can be afforded for these houses is shown at Fig. 96.

Slating.

72. I shall suppose that the rafters are all properly fixed, and that the top edges are all truly in one plane for each side of the roof. The size of the slates is "Countess," 20in. by 10in. Slates of various lengths cannot be mixed in any course. Each course must be of slates all of the same length; but slates may be used of different breadths in the same course if care is taken that the edge joints of two successive courses do not come too nearly together. If slates of uniform length and breadth are used over the whole side of any roof, the bands between the lower edges of successive courses are all of the same breadth, and the edge joints of alternate courses lie in the same straight lines from eave to ridge, the perpends are right. With slates of uniform size the slater has less concern than he would otherwise have. In this case, when he has got his double course at the eave settled, the distances between the battens are the same all the way up to the ridge. Slates are of many different sizes, as should be expected if it is remembered that they are stones which are quarried. Bricks are made of various sizes, but common building bricks are nearly of the same dimensions; the size of common bricks appears

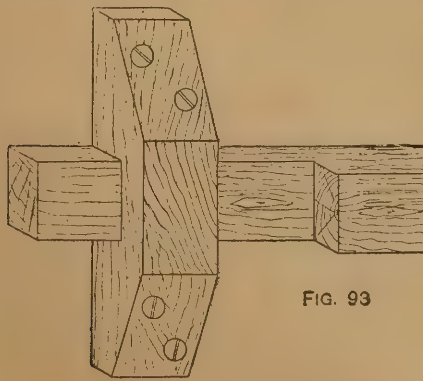
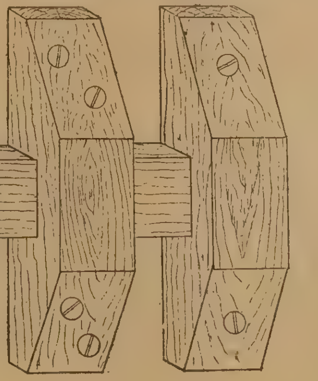


FIG. 93



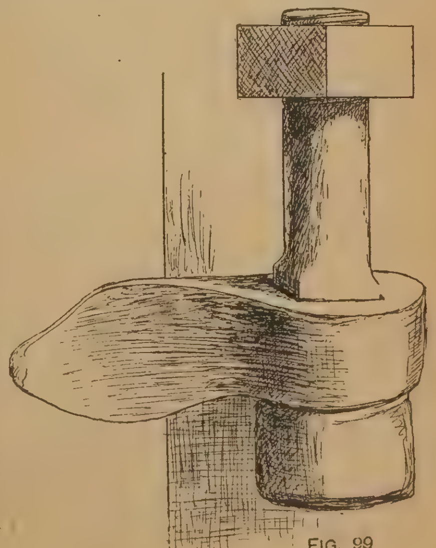


FIG. 99

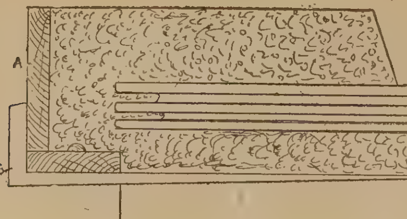


FIG 100

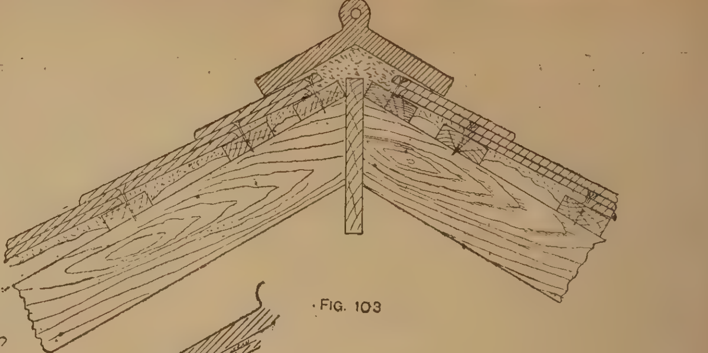


FIG. 103

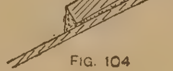


FIG. 104

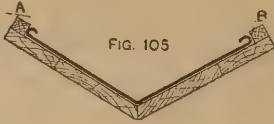


FIG. 105

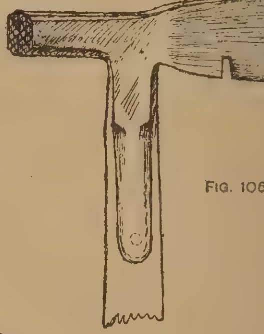


FIG. 106

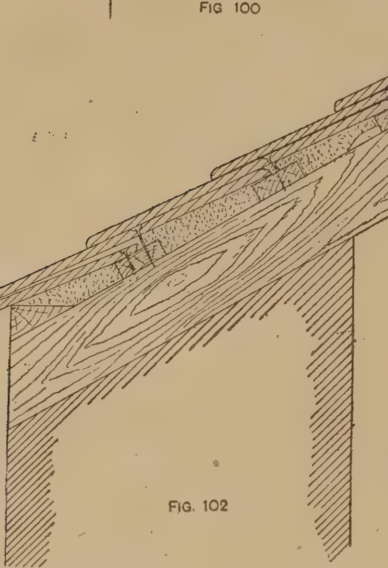


FIG. 102

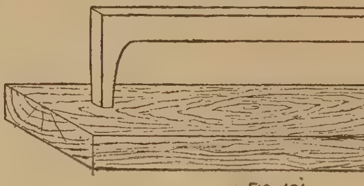


FIG. 101

to be that most convenient to meet the various conditions of manufacture and handling; the sizes of slates are necessarily various, just as stones quarried from natural bedding and jointing are various in size. In this country in the building trade slates of different sizes are given special names which are not of much assistance. Examinees are sometimes asked the sizes of "Ladies," "Countesses," "Duchesses,"&c. In some quarries twenty-six different sizes are supplied; it appears to be an unreasonable burdening of the memory to remember the names for all these sizes. The smaller sizes are sold by the M, which, so far as we are concerned just now, means 1,200 (dealers get an allowance from quarry owners for breakage, over 1,200), and the large sizes—"Imperials," 30in. long, "Rags," 36in. long, and "Queens," 36in. long—are sold by weight, by the ton. The slater goes over the slates as supplied; he tries them with his square across the tail (the dressed end which will be the bottom end), he tries them for size, and he dresses them to square and to size if they require it. When the slate is dressed it is gauged for the nail holes; the position of the holes is marked with the pick of the zax and the holes are made, and the prepared slate is set up in front of others in a similar condition. The slates are also examined for flaws, and unsound slates are set aside—if there are an unreasonable number they should be returned to the dealer; a few may come in for fraction slates at gables or barges, or at chimneys and skylights.

Slates are dressed by means of a tool called a *zax*; it is a blunt knife, with a spike, which stands up from the back about the middle of the length. The slate to be dressed rests on an iron straight-edge at the line to which it is to be dressed. A slater will sometimes use for the edge a heavy slate set on end. The bed of the slate is held uppermost in dressing, with the result that the edge next the bed is sharp, the other edge being roughly bevelled from the flaking of the slate; the holes are also driven from this side, and there is produced a rough countersinking on the other side.

Tilting fillet (Fig. 102).—It will be seen on examining a section of slating that there are three thicknesses of slates over any batten, but there are only two thicknesses at the face of the wall at the eave. If a common batten is nailed along the rafters, a slate resting upon it and upon the next batten would be parallel to the rafters, but the slates are not parallel to the rafters; it is, therefore, necessary to have something higher than a batten—this is called a tilting fillet. This tilting fillet is usually made more than the thickness of a slate higher than a batten, to give the slating what is called a "bell cast" at the eave. This makes the slates near the eave bear close at the tails, and it has some value in giving extra security here, giving better catch for the rendering inside and closing tighter against the wind outside. When it is necessary to cut a slate, the slater makes a line of holes with the spike of his zax, and along this line the slate easily divides.

A row of "half" slates 11½in. is put on, having the proper projection for the eave, say 3in. These "half" slates have their *beds* upwards; and each has a pair of holes in the head (driven opposite to the usual way). They rest on the tilting fillet and on the first batten, to which they are nailed; they are bedded on the "beam filling" in a full bed of mortar. The slates are holed so that the first row of slates—to show—are nailed near their middles to the first batten, their tails lying flush with the tails of the half slates and thus forming the slate eave. Care must be taken to break joint with the half slates. The portion of a slate which shows on the roof is called the "margin." If the battens are properly spaced to the gauge of the margin, with ordinary attention in nailing the tails of the slates will be in a straight line (battens should be the distance of the gauge *less the breadth* of a batten apart) and the margins will be all alike (with uniform-sized slates). In nailing slates near the middle great care must be taken (especially where the slate does not lie solid) not to drive the nail too far so as to put a strain on the slate (there is no danger of this kind where slates are nailed by the heads). The lap of a slate is the distance of the tail from the holes in the slate next beneath it. The slater should measure his rafter carefully to see whether he will, with the given lap, have any waste at the ridge, and he should increase the lap so as to have as little waste at the ridge as possible. The nails for this job will be 2½in. iron nails, warmed to thoroughly dry them, and dipped in boiled oil. The battens extend to within an inch of the faces of the gables. In slating up the barges a mould A (Fig. 100) is set up on iron hooks B, the slates are bedded in cement-mortar, which is allowed to take the shape of the mould and made to enclose the edges of the slates. When the slating is carried up to the ridge this barge will be completed in smooth-surfaced concrete as shown. This makes a secure and watertight finish to the barges. Just as the carpenter and slater meet on the question of nailing battens on the rafters, so the duties of the slater and plumber overlap in the question of flashings and valleys; and in finishing the barges, rendering and setting the ridges, he does work that might be claimed for the plasterer and mason. The general dressing of the slates is done on the ground, but there may be minor work for valleys, chimneys, &c., that is best done on the roof; for this purpose he will require a small "hard" or straight edge set on a small wood block (Fig. 101), and a light handy zax. Many slaters use a plasterer's lathing hammer (Fig. 106) for nailing battens and slates; the regular slater's hammer will be found more useful for repairs; slates may be holed by it, and any small dressing may be done with the trowel.

The sheeting for the valleys should be done by the carpenter. Lead should not be anywhere fastened with nails. If the sheeting is nailed to the rafters, as in Fig. 105, and the curbs A B nailed so as to make the distance A B wider at the top than at the bottom, the lead will not slip downwards. The lead should be cut, dressed and put in position by a plumber; the plumber should also cut the soakers, aprons and covers for flashings. Fig. 103 shows a cross-section of the ridge showing a roll-ridging. A very common error in some localities is to finish ridging with a pointing of cement drawn against the edge of the ridge-tile (Fig. 104). This is a vicious practice: the pieces of pointing soon break off and rattle down to valleys and into eaves-gutters. The ridge-tiles should be set on a bed of cement-mortar. The joints should be wide enough to allow this mortar to reach the surface, where it is cut off flush and smooth; a light bedding is sufficient along the edges, where the surplus should be cut off clean and flush. The slater having placed the soakers, the plumber will fit the covers in the raglets, and fix them with a few lead plugs; the slater will fill up the raglets to the lead with cement-mortar, and finish the joint smooth. In working with cement-mortar for these purposes, the slater must be very careful not to stain and smear the slates. Such work must be done in weather when there is no danger of rain coming before the cement is set to wash it over the slating. The slating is now to be rendered inside with good well-haired plasterer's coarse stuff. The stuff for this purpose will be improved by the addition of a proportion of Portland cement; it should be wel pressed into the spaces between the rafters and the slates and between the battens and the slates. The proper rendering of slates is of great importance; it properly beds and supports them and it prevents them rattling with the wind (it may be observed that the holes in old loose slates, iron-nailed, have become large enough to let the heads of the nails pass through, occasioned by this rattling). Zinc and copper-slating nails are cut by slates which move with the wind. Galvanised iron nails are probably best for slating.

(*To be continued.*)

BABYLON.

THE GERMAN EXPLORATIONS.

THE work of exploring the vast tumuli of "great Babylon," says a writer in the "Daily News," has at last been undertaken by an expedition organized by the German Oriental Society, under the direction of the able architect, Dr. Rober Koldowey, and a staff of Assyriologists. The work was commenced upon the great mound known as the "Kasr," or "palace," a tradition which the researches have confirmed, for here has been found the great royal residence of Nebuchadnezzar the Great (B.C. (604–561) and his successors. The most important discovery made as yet is that of the royal banqueting hall, or throne-room, a vast chamber 120ft. long and 60ft. broad, and which had once been richly-decorated with painted stucco, as described by the prophet Ezekiel.

There is every just reason to suppose that it was in this chamber the fatal last banquet of Belshazzar was held, when the corridors leading to it echoed to the tread of the advancing soldiers of Gobyras, the general of Cyrus, and on that night (Tammuz 16th, B.C. 538) the first of empires fell.

Leaving this chamber and passing without the palace ruins, still more interesting discoveries await us. On the east side of the palace were found the remains of a stone-paved broadway. This terrace was about 80ft. wide, and has been excavated for a distance of about 420ft., and the direction being ascertained, the termination was found near the south-east corner of the mound, making a total length of about 1,400ft., or over a quarter of a mile. It may well be compared with our Parliament Street, for at one end was the royal palace, like that of Westminster, and the sides were flanked by royal residences, temples and Government buildings. Below, on the west, were the royal grounds, and beyond those the "great river Euphrates." The whole length was paved with blocks of breccia of a reddish colour, no doubt originally laid in some design, but now displaced. The limestone blocks are the largest, being about 1yd. square and 1ft. thick. These massive blocks were laid on a brick foundation and fixed with bitumen. But they are no silent stones, for their surface tells an ancient story, for each is inscribed, the larger with the words: "I am Nebuchadnezzar, the King of Babylon, son of Nabupalassar, King of Babylon. The highway of Babylon for the Procession of the great Lord Merodach, with blocks of stone, the product of the mountains (limestone), I paved the street. May the Lord Merodach with everlasting life endow me." Built probably about the middle of the great king's reign—say about B.C. 580—few streets have been associated with so many epoch-making events as this Babylonian sacred way. Being the main way of access to the palace it would be the thoroughfare along which all the great pageants and royal entries passed. Some of these were epoch-making in their importance.

"The Famous Houses of Bath and District."—Messrs. Meehan announce the publication of this book by Mr. J. F. Meehan, with an introduction by the Marquis of Dufferin and Ava. It will be full of literary and other recollections. The illustrated articles on the mansions in the district include Longleat, Badminton, Dyrham, Fonthill Abbey, Ashton Court, Shockerwick, Bathford House, Kingston House (Bradford-on-Avon), Queen Charlton, Glastonbury Abbey, Montacute House, Clevedon Court, South Wraxall, Draycott and others. The edition will be strictly limited to 500 copies, and the price to subscribers will be 10s. 6d.

Keystones.

A Statue to Renan is to be erected in Tréguir, his native town.

A Bust of Falguière, the sculptor, is to be executed to the order of the French State by M. Marqueste, the Academician. The bust will be placed in the museum of Versailles.

At the Agricultural College, Cleobury Mortimer, Salop, extensive additions are being erected by Mr. H. Dorse, contractor, of Cradley Heath, Staffs.

Messrs. Gordon & Gunton are the architects whose designs have been adopted for the erection of office buildings and coal stores at the Hackney Electricity Works.

New Cottage Homes at Evesham have been built by the guardians at a cost of £1,650. Mr. H. S. Harvey was the architect, and Mr. William White, of Hampton, the builder.

The will and two codicils of the late James Brooks, F.R.I.B.A., have been proved by his son, Mr. B. C. G. Brooks, and Mr. E. F. Cross (of Sidcup), the executors. The value of the estate was £5,771 7s. gross and £3,939 16s. 11d. nett.

Truro Cathedral.—The cracked bases of the nave pillars in the new part of Truro Cathedral have been inspected on behalf of the committee by Sir Thomas Drew. When he has worked out his calculations he will prepare a report, which will be made public by the committee.

Charles Boulle was one of the great French cabinet-makers of the eighteenth century, and his fellow-craftsmen of the Faubourg Saint-Antoine, who strive to carry on the traditions of the older masters, are about to organise a movement for the erection of a statue to the famous *ébéniste.*

The London Drawing and Tracing Office Calendar for 1902 is embellished with a coloured representation of a nymph who is evidently of an architectural or engineering turn of mind, for she holds a pencil in one hand and a compass in the other. Readers should send for one of these calendars to 98, Gray's Inn Road, W.C.

A Stained-Glass Window in Memory of Queen Victoria has been placed in St. Mary's Church, Kettering. The window consists of seven lights. The central three are The Crucifixion, St. Mary, St. John; and the four outside lights: St. Peter, St. Andrew, St. Philip, St. Paul, the patron saints of four Kettering parishes. In the tracery at the top is the figure of St. George. The whole was designed and executed by Messrs. Percy Bacon & Brothers, of 11, Newman Street, London, W.

The Ancient and Extensive Kitchens of Holyrood Palace, in which nothing has been cooked since the days when Prince Charles Edward held his brief Court in Edinburgh during the "Forty-five," are now in the hands of workmen, and, together with the rest of the palace, are undergoing complete restoration. Up to the present the cooking for the High Commissioner's entertainments at the time of the General Assembly has been done at one of the large hotels.

Mr. David Law, the eminent etcher and water-colourist, died recently at Worthing. At an early age he was apprenticed to a landscape engraver, but finding landscape engraving losing popular favour, Mr. Law, in 1851, accepted an appointment in the Ordnance Survey Office at Southampton as a map engraver. After years of patient labour in this field the artistic instinct reasserted itself with irresistible force, and he left the public service to follow the career in which he gained such distinction.

A New Reredos at St. Endellion Church has been erected at the east end in place of the sombre and time-worn hangings behind the altar. The new oak reredos is a memorial of the late Queen Victoria. Gothic in style, it consists of a large centre niche, plainly backed, with a niche on each side filled with panels or squares, carved with delicate Gothic tracery. Dividing the niches are bold columns, patterned with spirals of acanthus, and bearing caps with shield reliefs. Each niche has a canopy. Panelling with a light open-leaf cresting, covers the chancel wall to the right and left of the reredos and up to its full height. The sanctuary has been further improved by having a substantial raised oak floor.

A New Technical Institute at Belfast is to be erected at a cost of about £100,000 by the Corporation of Belfast.

Mr. William Jacques is the architect for the erection of two blocks of buildings in Carter Road, Plaistow, for the West Ham School Board.

Wolverley Grammar Schools, near Kidderminster, are undergoing alterations from plans by Messrs. Meredith & Pritchard, architects, of Kidderminster. Mr. H. Dorse, of Cradley Heath, Staffs, is the contractor.

Americans and the Ecole des Beaux-Arts.—A group of American architects, grateful for the benefits derived from their study at the Paris School of the Beaux-Arts, founded a series of prizes to be awarded to students in the architectural section of the school. MM. Nicod, Danis and Hubaine are the successful competitors this year.

A New Hotel at Doncaster is to be built at the corner of Bridge Terrace and Hexthorpe Road, Doncaster, for Messrs. Hewitt Brothers, Ltd., brewers, Grimsby. The contract for its erection and for pulling down the property at present on the site, a portion of which is required for street improvement, has been secured at about £2,000 by Messrs. Mullins & Richardson, builders and contractors. The architect is Mr. Athron, of Market Place, Doncaster.

A Statue of the Great Sculptor Carpeaux is to be erected in his natal town of Valenciennes. M. Félix Desruelles has been chosen to execute the work. The idea is to represent the figure in working smock standing on a scaffold surrounded by a "vision" of the "Danse" and the "Cinq parties du Monde." The sculptural effect will be somewhat reminiscent of the famous atelier de Carpeaux by Maignan in the Luxemburg Museum.

Subsidences in the City.—Some anxiety is being manifested by owners and occupiers of properties in Finsbury Pavement in consequence of the cracks which have appeared not only in upper floors but in basements. In several cases the movement has assumed serious proportions, and the inference is that the settlements are due to railway works beneath the thoroughfare. Surveyors acting on behalf of property owners and the railway companies are drawing up reports on what has taken place. One of the buildings that has suffered extensively is the Moorgate Street Station of the City and South London Railway.

A New Fire-Station is being erected for the Fire Brigade Committee of the London County Council in Euston Road. The land has cost £7,700, and the contract for building amounts to £14,377. The builders are Messrs. Simpson & Co., and the supervising architect is Mr. W. E. Riley. The new station is to be an imposing building in Portland stone and red bricks. Ample provision will be made for the third officer's quarters, and quarters for the station officer, seven married men, coachman, and single men; and there is to be a large recreation-room. Stabling will be constructed for six horses, and the engine-room will be 39ft. by 33ft., with space for a horsed escape, steam-engine, and hose cart.

A New Training School for Seamen.—The Admiralty and the Home Office having condemned the industrial training ship "Formidable," stationed at Portishead, the managers of that institution are now contemplating the erection of a shore school at an estimated cost of £30,000. They have in view an eligible site, and are only awaiting assurances of support from public authorities before proceeding in the matter. The "Formidable" has been stationed at Portishead for thirty-two years, and during that time about 3,300 lads have passed through the school, of whom 2,100 have found their way into the merchant service and the Navy, the remainder going to situations on shore and emigrating. The annual cost of maintenance is about £7,000 or £8,000 and is mainly derivable from grants by the State, school boards and other authorities. It is proposed to build the proposed shore school after the pattern of the naval institutes at Portsmouth and elsewhere, with deck floors, hammocks, &c., and the tender now attached to the "Formidable" will be retained for the training of the boys.

Mr. G. F. Bodley, A.R.A., is the Prime Warden of the Fishmongers' Company.

Mr. David Marshall, a well-known Scottish antiquary, died last week at Kinross.

The New Board Schools at Cradley being erected in Colley Lane by Mr. H. Dorse, contractor, of Cradley Heath, Staffs, are nearly completed. They are now entirely roofed, and most of the glass has been put in.

In reference to the New Workhouse Infirmary, Sunderland, described on p. 326 of our issue for December 25th, we may mention that Messrs. E. H. Shorland & Brother's central patent Manchester stoves with descending smoke-flues are in use in all the various infirmary wards.

A Monument to M. Armand Rousseau, formerly Governor-General of Indo-China, is about to be erected at Brest. The work will be executed by the sculptor Denys Puech in collaboration with the architect Vandremer. The statue is in bronze, mounted on a quadrangular pedestal of granite.

The Victoria College at Alexandria, the building of which by a firm of English contractors has just been completed, has cost £3,000. It covers an area of 600 sq. metres, and has a frontage of 30 metres, with six large windows of Gothic design. The foundation stone of the building was laid in May last by Lord Cromer.

The Roman Catholic Cathedral, it is authoritatively stated, will not be opened in the present year. Although the building seems to the outside spectator to be approaching completion, it is far from finished, and the work in the interior is so extensive that the time for its completion is as yet merely a matter for conjecture. It is probable that before the building is completed and formally opened services will be conducted in one portion of it. Even this, however, will not take place by the time of the Coronation.

The King's Sanatorium.—Three premiums of £500, £200 and £100 respectively are offered for the best essays and plans of the sanatorium for tuberculosis to be erected in England with the £200,000 placed at the King's disposal by Sir E. Cassel. These essays and plans may be by a medical man alone, or in collaboration with an architect. They are to be sent in by April 15th to the Advisory Committee, addressed to Dr. P. Horton-Smith, 15, Upper Brook Street, W. Further particulars are given in the current issue of the "British Medical Journal."

Dr. Baurath von Schich, the well-known Palestine explorer and one of the best authorities on the topography of ancient Jerusalem, died in that city recently at the age of eighty years. Dr. Schich was one of the first Europeans who came to settle in Jerusalem, where he lived nearly fifty-five years, having left Wurtemberg, his native country, in 1846. First working as an architect and afterwards occupying himself in study and researches, he became thoroughly acquainted with the history of the country, especially with "Underground" Jerusalem. The deceased was a regular contributor to the quarterly statement of the Palestine Exploration Fund, and has made a unique and beautiful model of the Great Temple of Solomon during different periods—a model which is familiar to most of the tourists who have visited the Holy City during the last fifteen years.

Builders' Notes.

Alderman John Worrall, builder, of Congleton, died recently.

Mr. Thomas Turner, builder, of St. Margaret's, Norwich, died recently in his seventy-first year.

Mr. John Ham, builder, of Plymouth, died recently at the age of seventy-one years.

British Institute of Certified Carpenters.—The report of the session ending December last states that the membership has increased, fifteen having been added last year, bringing the total now upon the books to 135, not including hon. members. After several exhaustive meetings, the rules have been revised—by which associate members are admitted to the Council. An entrance fee has been adopted, together with increased subscription for the associate members.

Change of Address. — Messrs. Kirkpatrick Brothers have removed to the Manchester Granite Works, Trafford Park, Manchester, where they have secured two acres of ground immediately adjoining the ship canal. Their new works contain a full complement of the most modern machinery, all driven by electricity, for sawing, turning and polishing granite or other stone, including pneumatic tools for ornamental scroll and carved work. A large stock of British and foreign granites of every variety is held, and orders for any description of work will be executed with the utmost despatch. The position of the new works enables granite to be imported at a minimum of cost. Messrs. Kirkpatrick Brothers have been appointed sole agents for the Closeburn red freestone which has been largely used for important buildings in the North, and they hold a large stock of the stone. The depôt of the Bath Stone Firms, Ltd., also, is on their ground. Bath and Portland stones may always be obtained from stock.

Trade and Craft.

Door and Window Fasteners.

To adapt an old saying, one might observe that "of the making of window-fasteners there is no end"; which goes to prove that the old-fashioned article does not thoroughly satisfy requirements. "Podmore's Storm Fastener" (manufactured by Messrs. Colledge & Bridgen, of Wolverhampton) consists of a strong square bolt fixed to a base plate on the back sash and having at its opposite end a thumb-screw which passes into a countersunk hole in the base plate on the front sash. One turn of the screw fastens the bolt securely, lifts up the back sash, and draws the windows tightly together, so preventing draughts or rattling. The fasteners are supplied in black iron (with brass screw) at 10s. per dozen, or in brass at 14s. 6d. per dozen.

Anaglypta.

The Anaglypta Co. of Darwen have issued a new catalogue of their productions, which now, by the way, include the Salamander fireproof decorations. In addition to designs, actual specimens of material are bound up in the volume, thus enhancing its value as a book of reference. The designs are printed from photographs in a manner that does credit to the printers. A number of useful hints are given with regard to fixing, painted walls, damp walls, &c., and the application of the material to door-panel decoration. We have also received a separate book containing *inter alia* a representation of the beautiful peacock frieze and filling by Mr. G. C. Haité, with other designs by the same artist, and by others; and if any decorator desires to use the best material, and use it to the best advantage, he cannot do better than obtain these catalogues of the Anaglypta Co.

Sanitary Goods.

Considering how cast-iron sanitary pipes and fittings are being so increasingly employed, architects and builders should consult the new catalogue issued by Mr. John Jones, of Carlyle Works, Chelsea, S.W. The improved intercepting chamber illustrated therein is covered at the ground-level by a patent ventilating cover and frame which allow condensed moisture and any liquid that may percolate through the vent-holes to be carried away by a draining pipe and discharged into dry rubbish. The cover of the inspection chamber is so constructed that any packing that may be used cannot become rotted and so allow foul gases to escape: a wrought-iron brindle and heavy gun-metal screw afford a secure and strong fastening. The inspection-eye cover is double-sealed, and the clearing arm to the sewer is provided with a patent lever stopper which can be readily opened. Joints would be made with metallic lead, and there would thus be no risk of leakage. The castings have a specially-smooth inside surface, and are glass enamelled or coated with Dr. Angus Smith's solution. The special features of the improved cast-iron gulley shown in the catalogue are that the outlet at the bottom can be arranged to suit the exact fall of the drain, and that the middle and top pieces are made in various lengths for forming the connection between the trap and the ground-level; moreover, the middle pieces have one, two or three inlet sockets, and, being circular, can be turned round without disturbing the trap. Of the various kinds of manhole covers made by Mr. Jones are some with the tops recessed to receive tiles, mosaic, wood blocks or any other flooring to harmonize with the surroundings—a most happy provision. Several varieties of stable gulleys are shown in the catalogue; the "Drayton" retains sufficient water to ensure proper trapping and cleansing, but avoids a large body of stagnant water; while a particularly neat gulley-grating is illustrated on p. 34, being circular (either arched or flat) and fitting in a square frame. Mr. Jones is, in addition, a manufacturer of baths, lavatories, urinals, sinks, water-closets and other sanitary fittings; and he is also the patentee of the "Unfreezable" cistern overflow valve and of several drain-testing appliances.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CHERRYHINTON (near CAMBRIDGE).—For sewerage works for the Chesterton Rural District Council. Messrs. Waters & Worrall, engineers, 2 Sidney Street, Cambridge. Messrs. Beesley, Son, & Nichols, consulting engineers, Westminster, S.W.:—

Swann Bros., Cambridge	£16,311 0 8
Binn Bros., Croydon	13,467 3 7
Banyard, Cambridge	12,900 0 0
Cooke & Co., Westminster	12,183 0 0
Jackson, Essex	11,962 12 0
Underwood Bros., Dukinfield	11,897 0 0
Bell, Tottenham	11,198 0 0
Manders, Essex	11,087 0 0
Johnson Bros., Hereford	10,700 0 0
Burgoyne & Sons, Ipswich	10,622 17 0
Cutler, Hayward & Co., Lowestoft	10,290 0 0
Rayner, West Croydon	10,215 0 0
Bloomfield, South Tottenham	10,125 0 0
Wilkinson, Finsbury Park	10,055 0 0
Bentham & Co., Streatham Hill	9,937 0 0
Lock & Andrews, Nottingham	9,615 4 6
Johnson & Langley, Leicester	9,527 0 0
Jones & Sons,* Poole	9,233 7 5

* Accepted.

CROYDON.—For the erection of three shops and dwelling-houses in Mitcham Road, Croydon, under the supervision of Mr. Arthur L. Dartnell, architect and surveyor, 73 North End, Croydon:—

Smith & Son	£1,950	F. Sedgwick	£1,189
Simmonds & Co.	1,550	Ludlow & Martin	1,156
E. Goulder	1,385	W. Roberts	1,075

LONDON.—For the erection of a new theatre, St. Martin's Lane, Charing Cross, W.C. Mr. W. G. R. Sprague, architect, Fitzalan House, Arundel Street, Strand, W.C. Quantities by Mr. A. R. Henderson, surveyor, 47 Pall Mall, London, S.W.:—

Henry Lovatt	£27,950	Harris & Wardrop	£26,550
C. F. Kearley	27,600	C. Gray Hill	26,500
Patman & Fotheringham	27,593	Wilkinson Bros.	26,450
F. & H. F. Higgs	26,880	Kirk & Randall*	15,814
Geo. Longden & Sons	26,700	Walter Wallis	25,295

* Accepted.

LONDON.—For alterations at "The Earl of Warwick," public house, Stoke Newington, N. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E.C.:—

C. Dearing & Son	£976	Green & Smith	£820
S. Goodall & Son	883	Sheffield Bros.*	760
C. Chapman & Co.	863		

* Accepted.

LONDON.—For repairs to shop premises, Finsbury Pavement, London, E.C. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E.C.:—

J. W. Cooke & Co.	£275 12
A. Major	205 0
J. Jefford	194 0
T. Osborn & Sons*	180 0

* Accepted.

TEIGNMOUTH.—For erection of St. Michael's parish room:—

R. Truman	£1,648 10 7
G. Lee	1,300 0 0
P. C. Francis	1,280 0 0
G. Hayman	1,240 0 0
J. J. Hayman	1,225 0 0
E. Andrews*	1,196 4 5

* Accepted.

WESTCLIFF.—For the erection of a pair of houses, Westcliff-on-Sea, Essex. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E.C. Quantities supplied:—

Courtney & Fairbairn	£2,325 0
Baker & Wiseman	2,155 0
H. Dupont & Co.	2,085 0
A. Ducat*	1,898 10

* Accepted.

WOKING (SURREY).—For formation and sewering of Ashwood Road and remainder of Heathfield Road, Heathside Park Estate, Woking, Surrey, for the Suburban Building Land Company, Ltd. Messrs. Pooley & Follett, surveyors, 21 John Street, Adelphi, W.C.:—

New roads.

T. Adams, Wood Green, N.	£1,656 0 0
W. Langridge, Croydon	1,511 17 1
Chafen & Newman, Deptford, S.E.	1,442 7 10
H. Bentham & Co., Streatham Hill	1,413 0 9
G. A. Franks, Guildford	1,395 0 0
Drowley & Co., Woking	1,376 0 0
S. Kavanagh, Surbiton Hill	1,306 8 3

Sewers.

T. Adams	380 0 0
W. Langridge	359 12 9
Chafen & Newman	338 8 2
G. A. Franks	338 0 0
Drowley & Co.	336 0 0
S. Kavanagh	308 4 0
H. Bentham & Co.	281 0 0

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Jan. 9	London, N.W.—Making Baths Watertight	Hampstead Borough Council	O. E. Winter, Borough Engineer, Town Hall, Hampstead.
„ 9	Merthyr Tydfil—Two Cottage Homes	Board of Guardians	T. Roderick, Architect, Aberdare.
„ 9	Cardiff—Car Depôt	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
„ 9	Carleton, near Skipton—Methodist Chapel and School	——	J. Hartley, Architect, Skipton.
„ 11	Henley-on-Thames—Hospital Block	"Smith" Hospital Joint Committee	A. R. Lloyds, Clerk, Post Office Buildings, Henley-on-Thames.
„ 11	Longbenton, near Newcastle-on-Tyne—Alterations, &c.	School Board	Oliver, Leeson & Wood, Bank Chambers, Moseley Street, Newcastle.
„ 11	Edenderry, Ireland—Labourers' Cottages	No. 3 District Council	Mr. Waters, Civil Engineer, Edenderry.
„ 11	Kilkeeran—Wall	Edenderry No. 3 District Council	J. H. F. Bor, Clerk, Edenderry.
„ 13	Guildford—Corn Exchange	Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford.
„ 13	Pentre, Glamorgan—School Departments	Ystradyfodwg School Board	J. Rees, Architect, Hillside Cottage, Pentre.
„ 13	Birkenhead—Extension of Central Electric Lighting Generating Station.	Corporation	Brownridge, Borough Engineer, Town Hall, Birkenhead.
„ 13	Cwmcelyn, near Blaina, Mon.—Infants' School (200 Children).	Aberystruth School Board	R. L. Roberts, Architect, Abercarn.
„ 13	Killough, Ireland—Relaying Wood Floors	Governors of Charles Shields's Institution	G. M. Swail, Superintendent, Killough.
„ 13	Dover—Pulling-down and Rebuilding Inn	T. Phillips & Co.	A. H. Steele, 1 Effingham Lawn, Folkestone Road, Dover.
„ 13	Grimsby—Store	A. & R. Osborne	E. E. Bentley, 1 Pelham Chambers, Old Market Place, Grimsby.
„ 14	Derby—Steam-Roller Sheds, &c.	Plant and Stores Committee	J. Ward, Borough Surveyor, Babington Lane, Derby.
„ 14	Ardee, Ireland—Labourer's Cottage	No. 2 Rural District Council	L. Turley, 17 Laurence Street, Drogheda.
„ 14	Neyland—Repairs, &c., to Hall	Independent Order of Oddfellows	T. W. Evans, Front Street, Neyland.
„ 14	Woodhouse, near Sheffield—Police Station	West Riding County Council	J. V. Edwards, County Surveyor, Wakeland.
„ 14	Bury, Lancs—Retorts, Firebricks, &c.	Gas Committee	H. Simmonds, Engineer, Gas Works, Elton, Bury.
„ 14	Rotherham—Pulling-down and Rebuilding Inn	R. J. Bentley's Trustees	G. A. Wilson, Architect, Hartshead Chambers, Sheffield.
„ 15	Dunfermline—Carnegie Baths and Gymnasium	——	H. J. Blanc, 25 Rutland Square, Edinburgh.
„ 15	Brentwood, Essex—Relaying Floor of Schools	Hackney Union Guardians	W. A. Finch, 76 Finsbury Pavement, E.C.
„ 15	Plymouth—Enlargement of Head Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
„ 15	Alltwen, Wales—School	Cilybebill School Board	W. W. Williams, 63 Wind Street, Swansea.
„ 15	Farnham, Surrey—Underpinning Wrkhse. Ward Walls	Union Guardians	Friend & Lloyd, Architects, Aldershot.
„ 16	Barnstaple—Electricity Buildings	Town Council	A. Thorne, Borough Surveyor, Barnstaple.
„ 16	Sidcup—Administrative Block of Children's Houses	Greenwich Union Guardians	T. Dinwiddy, 12 Crooms Hill, Greenwich, S.E.
„ 18	Macclesfield—Extension, &c., of Bakehouse at Asylum	Committee of Visitors	H. Beswick, County Architect, Newgate Street, Chester.
„ 20	Bury—Central Tramway Depôt	Tramways Committee	A. W. Bradley, Borough Engineer, Bury.
„ 20	Brewood, Staffs—Reseating Church Nave	——	A. Weall, 84 Darlington Street, Wolverhampton.
„ 20	London, S.E.—Three Underground Conveniences	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa Road, S.E.
„ 20	Nelson, Lancs—Fireclay Goods	Gas Committee	A. J. Hope, Engineer, Gasworks, Nelson.
„ 21	Llangollen—Villa Residence	——	Mr. Denny, Architects, Llangollen.
„ 22	Luxulyan, Cornwall—Restoration of Church	Vicar and Churchwardens	Vicar, Luxulyan.
„ 22	Canterbury—Sanitary Conveniences	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, Canterbury.
„ 24	Norwich—Enlargement of Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, Westminster.
„ 25	Hartlepool—Electric Generating Station	Corporation	C. Robson, Borough Accountant, Town Hall, Hartlepool.
„ 25	Athenry, co. Galway—Five Houses	——	J. G. Skipton, Architect, Northgate Street, Athlone.
„ 27	Liverpool—Public Baths	Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool.
„ 30	Styal, Cheshire—Cottage Homes	Chorlton Union Guardians	J. B. Broadbent, 15 Cooper Street, Manchester.
„ 31	Penygraig, Wales—School	Ystradfellte School Board	T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.
No date.	Southwold—Cottage Hospital	——	E. N. Cubitt, Architect, Brentwood, Essex.
„	Hull—Schools	——	Broderick, Lowther & Walker, 77 Lowgate, Hull.
„	Hull—Alterations and Additions to Boys' Home	——	Broderick, Lowther & Walker, 77 Lowgate, Hull.
„	Tulse Hill—Two Houses	——	Mr. Sadgrove, 22 Surrey Street, Strand, W.C.
„	Kendal—Dwelling-House	E. Hetherington	J. Hutton, Architect, Kendal.
	ENGINEERING:		
Jan. 9	London, E.—Electric Wiring	Stepney Electrical Committee	Chairman, 27 Osborn Street, E.C.
„ 9	Ipswich—Heating	Union Guardians	A. F. Vullianny, 19 Tower Street, Ipswich.
„ 10	Barrow-in-Furness—Wiring Town Hall	Corporation	C. F. Preston, Town Clerk, Barrow-in-Furness.
„ 10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	G. H. Hill & Sons, 3 Victoria Street, Westminster.
„ 10	Winchburgh, Scotland—Waterworks	Linlithgow District Committee	W. A. Tait, 72A George Street, Edinburgh.
„ 11	Glasgow—Tramways	Corporation	J. Young, 88, Renfield Street, Glasgow.
„ 13	Paisley—Electric Tramway Plant	Corporation	C. F. Parkinson, Borough Elec. Engnr. Works, Blackhall, Paisley.
„ 13	Bilston, Staffs—Steel Roof Principals, &c.	British Electric Traction Co. Ltd.	Secretary, Donington House, Norfolk Street, Strand, W.C.
„ 14	Horley, Surrey—Electric Wiring and Fittings	London County Council	Chief Engineer, County Hall, Spring Gardens, S.W.
„ 14	West Ham—Condensing Plant and Crane	Town Council	Borough Electrical Engineer, Abbey Mills, West Ham, E.
„ 14	London, E.C.—Railway Rolling Stock, Bridgework, &c.	South Indian Railway Co., Ltd.	Sir George B. Bruce, 3 Victoria Street, Westminster.
„ 14	Armagh, Ireland—Wells	Rural District Council	W. Calvert, Clerk, Workhouse, Armagh.
„ 15	London, N.—Electrical Plant	Hornsey Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 16	Barnstaple—Electrical Plant	Town Council	W. H. Trentham, 39, Victoria Street, Westminster, S.W.
„ 16	Leeds—Condensing Plant	Lighting Committee	H. Dickinson, 1 Whitehall Road, Leeds.
„ 16	Congleton—Septic Tank and Filter Bed, &c.	Union Guardians	C. R. Hall, Engineer, Congleton.
„ 16	London, N.E.—Boiling Coppers, at Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„ 17	Chelmsford—Borehole Pump	Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
„ 17	London, N.W.—Electrical Plant	St. Pancras Borough Council	Electricity Department Offices, 57 Pratt Street, N.W.
„ 17	West Bromwich—Electric Tramways	Town Council	A. D. Greatorex, Borough Engineer, Town Hall, West Bromwich.
„ 18	Annalong, co. Down—Improving Harbour	County Council	County Surveyor, Courthouse, Downpatrick, co. Down.
„ 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
„ 18	Newcastle-on-Tyne—Four Hopper Barges	Tyne Improvement Commissioners	R. Unwin, Secretary, Berwick Street, Newcastle-on-Tyne.
„ 20	Grimsby—Electrical Plant	Corporation	W. A. Vignoles, Borough Electrical Engineer, Grimsby.
„ 21	Manchester—Electric Switchboards	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
„ 21	Middlesbrough—Electric Lighting Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 22	Leytonstone—Electrical Plant	West Ham Union Guardians	F. E. Hilleary, Clerk, Workhouse, Leytonstone, N.E.
„ 24	Clonmel, Ireland—Drainage Works, Water and Fire Mains, &c.	Workhouse Guardians	T. Beary, Clerk, Boardroom, Clonmel Union.
„ 24	Barking, Essex—Electrical Generating Plant	Urban District Council	Engineer, Electricity Works, East Street, Barking.
„ 25	Hartlepool—Electrical Plant, &c.	Corporation	C. Robson, Borough Accountant, Town Hall, Hartlepool.
„ 27	Madrid—Electric Tramway Concession	Spanish Ministry of Public Works	Commercial Department, Foreign Office, S.W.
„ 31	Johannesburg—Carburetted Water and Gas Plant	——	Crown Agents for the Colonies, Downing Street, London.
„ 31	Paignton—Waterworks	Urban District Council	F. W. Vanistone, Engineer, Palace Chambers, Paignton.
Feb. 5	Calcutta—Waste-water Meters	Corporation	F. Gainsford, Secretary to Corporation, Calcutta.
	FURNITURE:		
Jan. 31	Withington, Lancs—Filments and Furniture at Sanatorium.	Urban District Council	J. B. Broadbent, 15 Cooper Street, Manchester.
	IRON AND STEEL:		
Jan. 9	Nottingham—Lamps, Lamp Columns, &c.	Lighting Committee	Mr. Rhodes, Lighting Inspector, St. John's Street, Nottingham.
„ 10	Huddersfield—Copper Bonds, Tramway Rails, &c.	Corporation	Borough Engineer, 1 Peel Street, Huddersfield.
„ 13	Bilston—Structural Ironwork, Roof Principals, &c.	British Electric Traction Co., Ltd.	Secretary, Donington House, Norfolk Street, Strand, W.C.
„ 13	Burnham, Somerset—Iron and Steel Substructures	Urban District Council	W. J. Press, Council's Surveyor, Burnham.
„ 13	Camberwell—Iron Fencing, Gates, &c.	London County Council	Parks Department, 11 Regent Street, S.W.
„ 14	London, E.C.—Bridge Works, Railway Stores, &c.	South Indian Railway Co., Ltd.	Sir George B. Bruce, 3 Victoria Street, Westminster.
„ 15	London, E.C.—Tools and Stores	Bombay, Baroda & Central India Rly. Co.	T. W. Wood, Secretary, Gloucester House, Bishopsgate Street Without, E.C.
„ 28	London, S.W.—Tramway Rails	London County Council	Clerk, County Hall, Spring Gardens, S.W.
„ 30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.
	PAINTING AND PLUMBING:		
Jan. 9	Castleford—Painting Market Hall	Urban District Council	W. Green, Surveyor, Castleford.
„ 10	Halifax—Painting, Colouring, &c., at Town Hall	Finance Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
„ 10	Hamilton, Scotland—Painting at Offices	District Committee	A. Cullen, Architect, Brandon Chambers, Hamilton.
„ 11	Hull—Cleansing, Painting, &c., at Pumping Station	Water and Gas Committee	F. J. Bancroft, Water Engineer, Gelder Street, Hull.
„ 13	Scarborough—Plumber and Glazier work	Town Council	H. W. Smith, Borough Engineer, Town Hall, Castle Rd., Scarborough.
„ 24	Clonmel, Ireland—Plumbing Work at Workhouse	Guardians	T. Beary, Clerk, Boardroom, Clonmel Union.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ROADS AND CARTAGE:		
Jan. 9	Cardiff—Street Works	Corporation	W. Harpur, Borough Engineer, Cardiff.
„ 9	Castleford, Yorks—Improvement Works	Urban District Council	W. Green, Surveyor, Castleford, Yorks.
„ 11	London, S.W.—Vans, Street-Sweeping Machines, &c.	Westminster City Council	J. W. Bradley, City Engineer, Town Hall, Westminster.
„ 11	Little Ealing, W.—Tar-Paving, Gravelling, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„ 11	Leigh, Lancs—Granite Setts	Corporation	T. Hunter, Borough Engineer, Bank Chambers, Leigh.
„ 11	Runcorn—Street Works	Rural District Council	R. Garnett, 45 Sankey Street, Warrington.
„ 13	London, N.W.—Street Works	Hendon Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
„ 13	Bournemouth—Tip-Carts, Water Vans, &c.	Town Council	F. W. Lacey, Borough Engineer, Bournemouth.
„ 13	London, E.—Materials	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
„ 14	London, N.—Street Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
„ 15	Lancaster—Materials	Corporation	Borough Surveyor, Lancaster.
„ 15	Croydon—Making-up Streets	Rural District Council	R. M. Chart, Surveyor, Town Hall, Croydon.
„ 15	Lancaster—Setts for Tramways	—	Borough Surveyor, Town Hall, Lancaster.
„ 16	London, S.E.—Kerbing, &c.	Borough Council	Surveyor, Town Hall, Catford.
„ 16	London, S.E.—Dust Carts, &c.	Borough Council	Surveyor, Town Hall, Catford.
	SANITARY;		
Jan. 9	London, N.W.—Main Drain to Baths	Hampstead Borough Council	O. E. Winter, Borough Engineer, Town Hall, Hampstead.
„ 10	Upholland, Lancs—Pipe Sewer	Urban District Council	C. E. Senior, Clerk, Council Offices, Upholland.
„ 11	Swinton, Manchester—Sewer	Urban District Council	Surveyor, Council Offices, Swinton.
„ 13	Maidstone—Disinfectants	Urban District Council	Sanitary Inspector, Maidstone.
„ 13	Alnwick—Cleaning-out Tanks	Rural District Council	H. W. Walton, Clerk, Alnwick.
„ 13	Bingley, Yorks—Pipe Sewer	Urban District Council	B. Bottomley, Surveyor, Town Hall, Bingley.
„ 13	Hambledon, Guildford—Scavenging	Rural District Council	F. Smallpiece, 138 High Street, Guildford.
„ 13	Heavitree, Devon—Sewer	Urban District Council	F. E. Simpson, Surveyor, Church Street, Heavitree.
„ 15	Lancaster—Pipes	Corporation	Borough Surveyor, Town Hall, Lancaster
„ 16	Buckhurst Hill, Essex—Bacteria Beds, Filters, &c.	Urban District Council	H. Tooley, Architect, Buckhurst Hill.
„ 16	Congleton—Septic Tank, Filter Bed and Main Drain	Union Guardians	C. R. Hall, Engineer, Congleton.
„ 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
	TIMBER:		
Jan. 14	Swanley, Kent—Park Pale and Other Fencing	Metropolitan Asylums Board	Newman & Newman, 31 Tooley Street, S.E.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 11	Lowestoft—Yacht Club House (to cost £4,200)	£25, £20, £15.	H. T. Clarkson, Secretary, Royal Norfolk and Suffolk Yacht Club, Lowestoft.
„ 13	Ennis—Architect to be appointed for Additions to Lunatic Asylum.	—	J. Enright, Clerk of the Asylum, Ennis.
„ 15	Kirkcaldy—Technical and Science and Art School (400 to 500 pupils).	—	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 15	Kirkcaldy—Elementary School (400 pupils)	—	A. Beveridge, Clerk to Burgh School Board, Kirkcaldy.
„ 20	Dublin—Water Supply and Drainage Scheme	£50.	J. O'Neill, Clerk to North Dublin R.D.C., Boardroom, North Brunswick Street, Dublin.
„ 31	Bangor—Infants' School [Local Architects Only]	—	A. C. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
„ 31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
„ 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
„ 31	Newport, Isle of Wight—Queen Victoria Memorial	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
„ 31	Liverpool—Rebuilding Children's Infirmary [Six Architects to be Selected].	£50 each.	Colonel C. F. Bell, 17 Fenwick Street, Liverpool.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
„ 4	Mountain Ash, Wales—Municipal Offices	£75.	J. Williams, Surveyor to U.D.C., Town Hall, Mountain Ash.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

Masters and Men.

The Coventry Building Trade.—Notices in the Coventry building trade for any variation in the scale of pay have to be served by the end of any year. In 1900 the masters' notices for reduction, &c., went in too late, as the Board of Trade arbitrator ruled. The employers have again given notice of reductions of ¾d. per hour in skilled workmen's wages and ½d. on unskilled labour; the men have replied with a demand for an increase of wages.

The Bristol Building Trade.—The Bristol Master-Builders' Association have given six months' notice to reduce the wages of all employees by 1d. per hour. Slackness of trade and the overflow of the labour market are assigned as the reasons, there being more men out of work than for several years past. The war has seriously affected trade, and the enhanced cost of labour and material has checked building enterprise. At present skilled workmen are receiving 9d. per hour, averaging £2 per week, and the proposed reduction represents 4s. weekly. The builders' labourers, earning about 27s., will suffer the most seriously by the threatened reduction, which is viewed with dismay.

Bradford Building Trade Dispute.—Negotiations between the representatives of the labourers employed in the Bradford building trade and the Bradford and District Master Builders' Association have resulted in the settlement, so far as the labourers are concerned, of the dispute which has been in progress since the 1st of May. The cause of the dispute was the refusal of the masters to grant an advance of 1d. per hour in the wages paid, and the men left work at the same time as the masons and joiners, who were and are still resisting a reduction of ½d. per hour and certain alterations in the rules regulating employment. Recently the secretary of the Labourers' Union wrote to the Master-Builders' Association stating that the men desired to withdraw their demand for an increase of wages, and asking that they might be reinstated as early as possible, without prejudice or malice. A conference followed, at which the men expressed their willingness to come to terms on the basis of the arrangement which prevailed in 1894. This offer was accepted, and the masters decided to circularise the federated employers, stating that "although they feel that it will be difficult to find employment for all the men at once, it is hoped they will replace the men as early as ever possible without prejudice." The terms of settlement provide that the wages shall be 6d. per hour. During the course of the dispute the men have been in receipt of 10s. a week as strike pay, but the funds are now nearly exhausted. The number of men ready to start work again is about 120. As regards the masons and joiners the settlement of the dispute seems as far off as ever. In both cases the men are receiving an out-of-work allowance of £1 per week; and as they have wealthy unions behind them, it would seem that they will be able, unless the improbable contingency of a general strike should arise, to continue the struggle indefinitely.

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COMING EVENTS.

Wednesday, January 8.

Society of Arts.—Sir Henry Trueman Wood on "Photography and its Applications"—II., 5 p.m.

Geological Society of London.—Meeting at 8 p.m.

Northern Architectural Association.—Students' Evening.

Society of Biblical Archæology.—Annual Meeting at 8 p.m.

Thursday, January 9.

Manchester Society of Architects.—Spécial General Meeting to elect a Fellow and an Associate. Mr. J. D. Crace on "Relation of Colour to Architecture," 6.45 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m. Ballot for Election of Fellows.

Institution of Electrical Engineers.—Discussion of the Technical Reports of the Institution Visit to Germany, 1901, by the Committees on Traction, Light and Power, Manufacturing, and Telegraphs and Telephones, 8 p.m.

Sheffield Society of Architects and Surveyors.—Mr. W. Watts, F.G.S., on "Concrete and its Use."

Royal Institution.—Prof. J. A. Fleming on "Waves and Ripples in Water, Air and Æther"—VI., 3 p.m.

Friday, January 10.

Architectural Association (Discussion Section).—Mr. P. W. Mulready on "The Work and Influence of Augustus Welby Pugin," 7.30 p.m

Glasgow Technical College Architectural Craftsmen's Society.—Mr. A. B. M'Donald, M.I.C.E., on the 'Highlands of Central Europe," 8 p.m.

Birmingham Architectural Association.—Mr. John Ward on "Pictures from Penzance and the Land's End."

Monday, January 13.

Surveyors' Institution.—Mr. John H. Hanson, F.S.I., on "Rivers' Pollution : Purification of Trade Waters from a Mill Occupier's Point of View," 8 p.m.

Society of Arts (Cantor Lecture)—Mr. Samuel Rideal, D.Sc., F.I.C., on "The Sterilization of Water"—I., 8 p.m.

Royal Geographical Society.—Dr. Logan Jack on "A Journey from Shanghai to Bhamo," 8.30 p.m.

Royal Academy.—Prof. V. C. Prinsep, R.A., on Painting"—I., 4 p.m.

Bristol Society of Architects.—Mr. F. Bligh Bond, F.R.I.B.A., on "Rood Screens, English and Continental," 8 p.m.

Tuesday, January 14.

Royal Institution.—Dr. Allan Macfadyen on "The Cell: Its Means of Offence and Defence. Immunity"—I , 3 p.m.

Institution of Civil Engineers.—Mr. Henry Bridges Molesworth, M.I.C.E., on "American Workshop Methods in Steel Construction," 8 p.m.

Wednesday, January 15.

Surveyors' Institution.—Students' Preliminary Examination (First Day).

Northern Architectural Association.—Mr. James Bruce on "Recent Data concerning Concrete Beams and Concrete Floors," 7.30 p.m.

Society of Arts.—Mr. Frank J. Gray on "Elliptographs," 8 p m.

Chemical Society.—Meeting at 5.30 p.m.

British Archæological Association.—Meeting at 8 p.m.

Institute of Sanitary Engineers.—Presidential Address by Dr. J. C. Thresh, M.D., D.Sc., 7 p.m.

Thursday, January 16.

Surveyors' Institution.—Students' Preliminary Examination (Second Day).

Leeds and Yorkshire Architectural Society.—Dr. N. Bodington on "Schliemann's Troy," 6.30 p.m.

Royal Academy.—Prof. V. C. Prinsep, R.A., on Painting"—II., 4 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Royal Institution.—Dr. A. S. Murray on "Recent Excavations at Delphi and in the Greek Islands"—I., 3 p.m.

Society of Arts.—Mr. Francis Henry Skrine on "Bengal: The Land and its People," 4.30 p.m.

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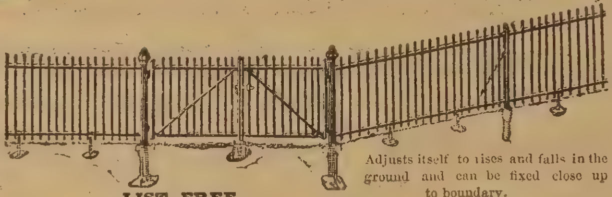

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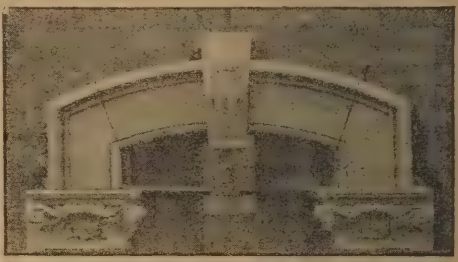

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JAN. 15, 1902.
No. 362.

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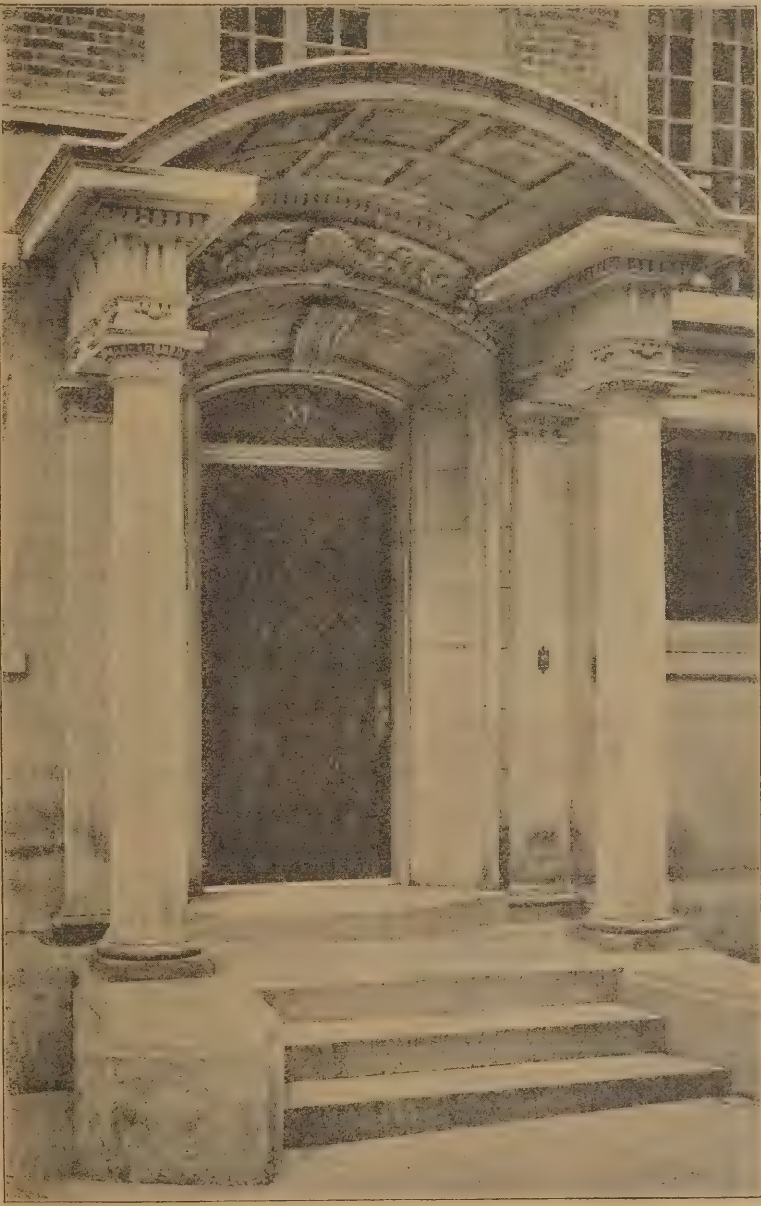
An Architectural Causerie.

Another Case of Overloading. REFERENCE has already been made in these columns to the dangerous practice of piling goods on floors and landings which were never intended to sustain such weights, and we specially mentioned printing houses, where the heavy "formes" are packed together in hundreds without any thought of the strength of the supports. Last week a case of overloading resulted in two workmen being severely injured in London. It appears that a house at the corner of Bridewell Place and Tudor Street was being pulled down, and that owing to the heap of bricks placed on the first floor after the demolition of the upper portion of the house, an iron girder on this floor broke and a collapse occurred; a foreman and a labourer being buried in the debris. This shows how necessary it is to observe the fact that floors are only intended to support certain weights.

"Hearts of Oak" Competition. IT is worthy of note that in the "conditions" issued to competitors for the Hearts of Oak Benefit Society's new head-offices to be erected in Euston Road, London, the suggestion was made to avoid "fussy" detail as far as possible and also to avoid unnecessary finishing of the drawings; "so long as the design is as clear and as simple as possible, this is all the assessor wishes." Mr. Sidney R. J. Smith, F.R.I.B.A., was the assessor, and he is to be congratulated on the manner in which he has carried out his duties. The twenty-two sets of designs submitted are exhibited at the Society's present head-offices at 17, Charlotte Street, Fitzroy Square, W., and on the whole they are of very fair merit. Undoubtedly the best plan is that which has been awarded the first premium of £100 (it is numbered 17, but the authors' names are not yet made public). This plan is particularly straightforward, and the various offices are arranged in a manner which affords convenience to the working staff and to the depositors who attend in such numbers. The general office (78ft. by 38ft.) is placed at the rear of the site (which is next westwards to the Women's Hospital), the object being to get light from three sides. The building is set back from the old line, and the central entrance in Euston Road leads to a vestibule having an enquiry office at one side and a physician's room at the other. Beyond is the main entrance hall with doors opening into the general office, around which the various rooms for the staff are arranged, while a postal room is provided at the back end. On the first floor is the delegates' hall (to seat 310), extending up two floors, and covered by a domed roof. The rest of the first floor, and the second and third floors, are occupied by numerous rooms for the staff, and living quarters. In the basement are a letter-room 38ft. by 35ft., several strong-rooms, typewriters' room (58ft. by 14ft.), an order-room (43ft. and 14ft.) and other accommodation. The public space in the general office is lighted by a domed skylight in the internal open area from the first floor upwards, which also lights the staircase, halls and corridors. The secretarial department is mostly on the mezzanine floor over the entrance. The architects' estimate (893,479 cub. ft. at 11d., and additions) amounts to £48,601, which is in excess of the sum stated in the conditions (£45,000), but the cost would be £3,331 less if the buildings were kept to the present line and not taken back further, though this would mean a loss of light. Heating is by low-pressure hot water; ventilation mostly on the "Natural" system; the external elevations to Euston Road and Grafton Place to be in grey Aberdeen granite to the basement floors and Portland or Derbyshire gritstone for the rest of the building. The design which has been awarded the second premium of £75 is numbered 3. Its plan (which shows the general office with a circular counter) is nothing like so good as the other, and the elevation to Euston Road, "Italian Renaissance classically treated," is most distressing. The architects' estimate is £46,048. The design numbered 22, which is awarded the third premium of £50, is better. The authors think it would be found impossible to adequately light the general office from the sides only, so they have provided a large lantern over the centre, supplemented by windows at the sides. The estimate is put at £44,966. Of the remaining nineteen sets of designs, those numbered 5, 20, 2 and 12 deserve special mention: they all exhibit a careful simple treatment; but the rest do not call for any remarks. In all cases the competitors' observations are hung with their designs, a most desirable, though often neglected, requisition.



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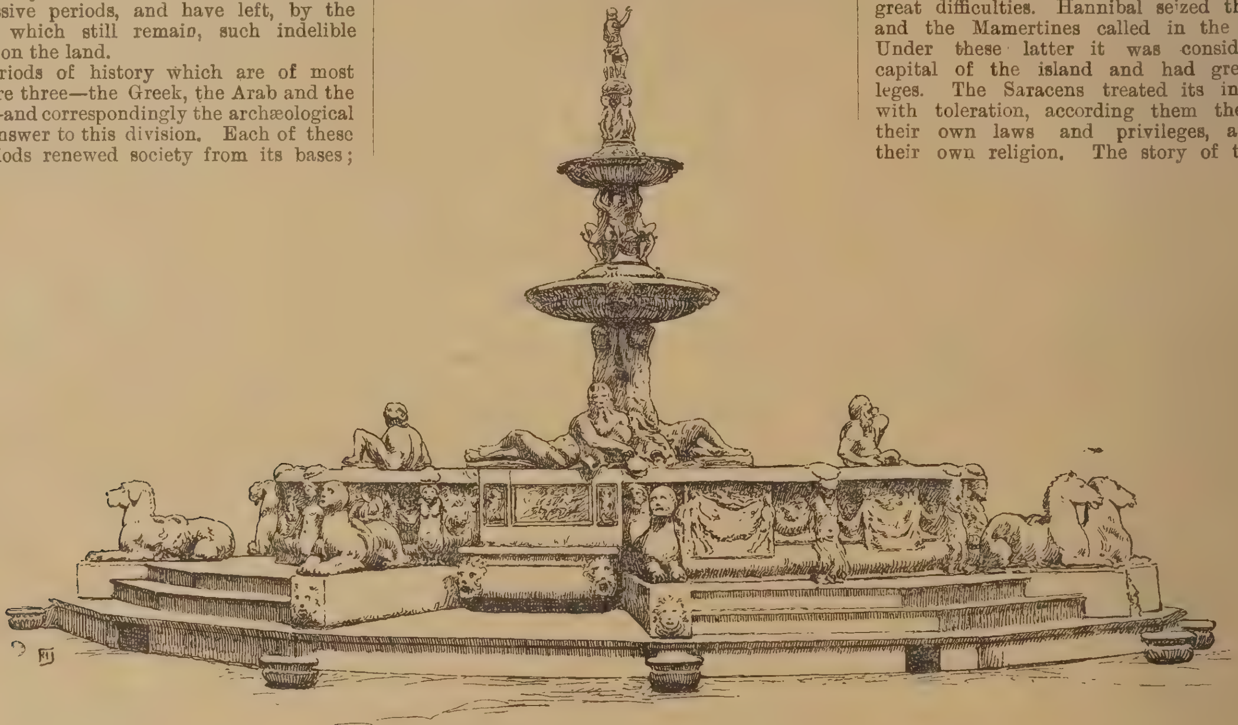
Piccadilly Widening. THE widening of Piccadilly is proceeding, and a strip will be taken off the Green Park varying from 11ft. to 35ft. in width. The average addition to the width of the road will be about 18ft. The alterations will cost £13,000, and will take between two and three months to complete. A concrete foundation for the iron railings is to be laid first, and then the outer path, which is to be of York paving, will be proceeded with. The present alterations constitute about one-third of the original scheme of widening, but whether they will prove of any material benefit remains to be seen. It is in the portion of Piccadilly from the Circus to St. James's Street that the congestion is so inconvenient; yet nothing is attempted to improve matters here.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—I.

By F. HAMILTON JACKSON, R.B.A.

THE island of Sicily, by virtue of its position between Europe and Africa, has been liable to many vicissitudes, and has suffered many things at the hands of different masters who have left marks of their presence both upon the land itself and upon the people who inhabit it. Greek, Roman, Arab, Norman, Spaniard and Frenchman have all ruled there at one time or another; but the primitive stock, the Siculan, has modified and absorbed the various elements in the majority of cases, and the Sicilian character is still not very different from what it was many centuries ago. The island is triangular, one side facing the Ionian sea, one facing Africa, and one looking across the Tyrrhenian sea towards Italy, and these directions indicate the various influences which so profoundly modified the conditions of life at successive periods, and have left, by the buildings which still remain, such indelible marks upon the land.

The periods of history which are of most interest are three—the Greek, the Arab and the Norman—and correspondingly the archæological remains answer to this division. Each of these three periods renewed society from its bases; new laws were introduced, new customs, new religions and tongues with the admixture of fresh blood; in each such a change was made as if the past had never existed. The first was the Greco-Siculan, in which the island appeared as a Greek nation with Syracuse as head and representative, though the various communities, which were continually warring with each other, were some of them Greek colonies, some Greco-Siculan, and some Siculan entirely or with admixture of other peoples. This period made the island known to the world, and has left behind it considerable remains, many of which were a good deal altered in Roman times. Next came the Arab period, when the Byzantine rule had become weak and ancient civilization decadent. The new dominator brought his own laws and religion, the acceptance of which at least saved the Sicilians from the corrupt and thievish government of Constantinople. Palermo now became the capital of the island, which was divided into three great compartments called "Valli"; and by its beautiful buildings, by its immense population interested in science, literature, arts and industry, equalled the former reputation of Syracuse. The remains of their productions are few, but it was from their civilization that the Normans reaped such advantage and developed the magnificence which was so striking to their contemporaries, the remains of which are so admirable and the goal of so many pilgrimages. Under their rule the fusion of the various elements, Latins and Greeks, the barbarian tribes which had become Italianized on the peninsula, Lombards and Normans, Byzantines and Arabs, prepared the way for the Italianizing of the island. The French domination was but short and left scarcely a trace, but the Aragonese and Castilian rule introduced a Spanish influence which is very perceptible in the buildings of the later Gothic and earlier Renaissance periods—after which there is little or nothing worthy of note in Sicilian art.



FOUNTAIN OF ORIONE, MESSINA, BY MONTORSOLI. DRAWN BY F. HAMILTON JACKSON, R.B.A.

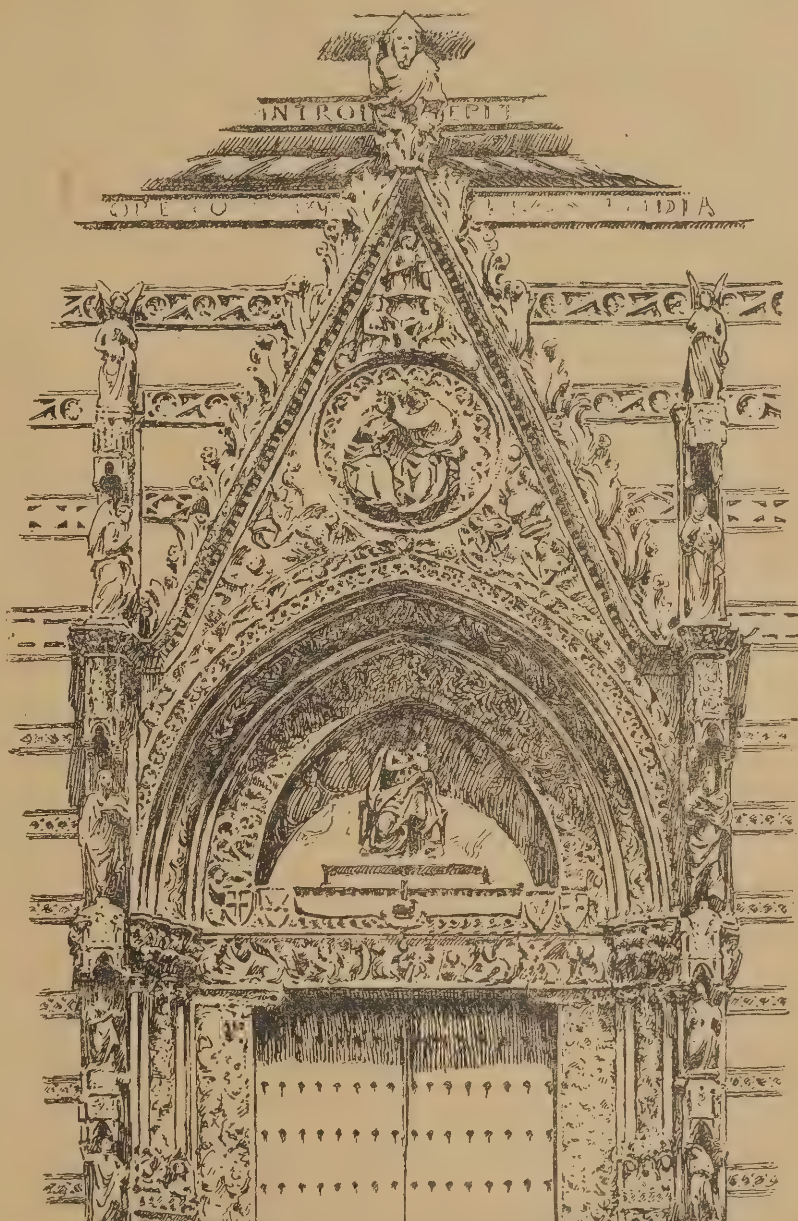
The two principal ways of reaching Sicily are by boat to Palermo from Naples, and by train to Reggio, from which a steam ferryboat crosses to Messina, conveying the mail van and trucks as well as passengers. A convenient plan to adopt in visiting the interesting places in the island is—starting from Messina, to proceed thence to Taormina, and, passing round the back of Etna, to visit the picturesque old town of Randazzo, a type of the inland mediæval towns; then continuing through Catania to Syracuse, and returning on one's steps as far as Bicocca, going through the centre of the island to Girgenti. Thence across to Palermo is not a very long journey, and several excursions may be made from that place; while Cefalù may be visited on the return journey to Messina. In this manner most of the celebrated antiquities, both Greek and Roman, may be seen, as well as those of the Norman Saracenic period, and at Cefalù may also be seen what is said to be the only piece of prehistoric architecture in the island, most probably erected by the Siculi. It is for its antiquities that Sicily is visited, though the scenery is also very fine; for the later Renaissance work has all the vices of the baroque, while the modern buildings are most of them very inferior; though at Palmero an enormous theatre has been erected which quite dwarfs the cathedral and the royal palace in a distant view of the town, being far the most conspicuous object on the skyline.

The harbour of Messina stretches around a curve the chord of which is about 3 kilometres, the more distant towers of the town rising above an almost continuous line of similar buildings which surround the port in what some consider a magnificent and others a rather dull fashion. The town is built on the sides and at the foot of a natural amphitheatre of hills, in a situation which is really fine, and should have excited the imagination of the builders or architects to accomplish, or at least attempt, greater things. It is from this curve, completed by the mole which terminates the port, that its ancient name of "Zancle," the sickle, was taken. This harbour is one of the best in the world, and is the busiest in Italy for steamboat traffic. The citadel, a work of the seventeenth century, from which the bombardment of 1848 took place (which gained for Ferdinand II., King of Naples, the epithet of King Bomba), lies across the harbour from the town, near the pier railway station. There are no remains of the antique period, although the city is of very ancient date, having been founded in 732 B.C., according to Greek tradition, on the site of a Siculan town. The name "Zancle" is, however believed to be Siculan, so that it is probable that the city was not destroyed, but only conquered, as happened in many other cases. The name of Messina, or Messana, was given it about the beginning of the fifth century B.C. by emigrants from Messina in the Peloponnesus, who came there while Anaxilas of Rhegium controlled the city. It was the cause of the first Punic War through the action of the Mamertines, a mercenary legion of Agathocles, cast out of Syracuse because of their turbulence, who came as friends to Messina, and being received in a friendly way treacherously assailed the citizens and, terrorizing them, gave a new name to the city, that of Mamerte. Their turbulent and aggressive spirit landed them in great difficulties. Hannibal seized the castle, and the Mamertines called in the Romans. Under these latter it was considered the capital of the island and had great privileges. The Saracens treated its inhabitants with toleration, according them the use of their own laws and privileges, and even their own religion. The story of the three Messinese who came to Roger Hauteville (whose first raid took place in 1060) to ask him to undertake the conquest of Sicily and liberate them from the infidel yoke can hardly be true, since their surnames are given, inasmuch as surnames were first used by the Venetians and at a later period than the eleventh century. Richard Cœur de Lion in 1189 wintered here with Philip Augustus, on which occasion there was fighting between the Messenians and Richard's troops, for which King Tancred rewarded Messina by conceding immunities and privileges which made it almost a free city. These were further increased a few years later under Henry the Sixth, who made it his favourite dwelling and base of operations, and it was here that he died in 1197. In the war of the Sicilian Vespers it was besieged for two months by Charles of Anjou, whose fleet was finally defeated by Roger de Lauria, the Spanish admiral, with so much effect that twenty-nine ships were captured and eighty burnt under the eyes of Charles, who "gnawed his fingers with rage" at the sight. In 1678, after internecine feuds and a period of French domination, the Viceroy Francesco Bonavides took away all the privileges of the town, picturesquely driving a plough over the site of the destroyed senatorial palace and sowing it with salt, while he left the doors of the archives of the cathedral open (from which he had removed all the precious documents recording the privileges accorded to Messina from the times of the Eastern Empire, and from Normans, Suabians and Aragonese).

The cathedral was commenced by King Roger on the site of another which had been used as a stable in Saracen times. It was consecrated on October 11th, 1197, and is the largest Arabo-Sicilian building which dates from those times. The nave has twenty-six antique granite columns, which are said to have come from a temple of Neptune near the Faro. The bases are made up with plaster, and the gilded caps are some of them of the antique Ravennese type, and some of the period of the foundation. The proportions are fine; but the later Renaissance work of the period when the dome was added (1682) has spoilt the effect. The pointed arches were then made round, with other alterations. The transepts are 145ft. wide and the nave is 305ft. long; this terminates in a semicircular apse, and the mosaics of the semi-dome date from the fourteenth century. They represent—in the centre Christ, with the Virgin and St. John, and Frederick the Second of Aragon (the donor) with his son Peter and Archbishop Guidotto; to the right St. John the Evangelist with King Lewis and the Duke of Athens; and to the left the Madonna with Queen Eleanor and Queen Elizabeth. They were much damaged by the earthquake of 1896, and it was found that the mastic which held the tesseræ had parted from the vault in many places, necessitating restoration, which is now proceeding. Beneath is the costly and tasteless altar, made up of precious Sicilian marbles. It was made in 1628 and cost 3,825,000 lire (!). Above it is a frame containing the celebrated Madonna della Lettera, a Byzantine painting of the fifth or sixth century (ascribed of course to St. Luke). Behind the altar in a little cupboard is the letter of the Virgin, reconstructed by Constantine Lascaris in the fifteenth century, the *soi-disant* original having been burnt in the conflagration of 1254, during the obsequies of Conrad the Fourth. The roof imitates the ancient roof; along the top is a row of sunk rose panels like those of the Capella Reale, Palermo. It is painted elaborately. The choir seats were carved by Giorgio Veneziano (1540), and are ornamented with panels in intarsia. There are some pretty Renaissance monuments and altars and a good font with marble inlays; the pulpit, by Calamech or Bonanno, is not so successful. In the choir are buried the Emperor Conrad the Fourth, Alphonso the Generous, and Queen Antonia, the widow of Frederick the Third of Aragon; and in the transept several archbishops, the tomb of one—Guidotto de 'Tabiatis, who restored the building after the fire of 1254—having been made by Gregory of Siena. In the south-west corner a piece of the original walling shows—alternate courses of white and black marble. The western façade has three pointed doors: that in the centre is the finest Gothic work in Sicily, as far as its ornamentation goes. The general effect is pinkish-white relieved with red, with a little inlay in bands which are bounded by courses of dark-green marble, panelled sinkings sometimes replacing the inlays. The Renaissance architects played strange tricks with the façade, adding monuments between the doors, huge scrolls rising to a cornice in the upper part and finishing with vases, other scrolls and funny Gothic crockets standing on their tails up the gable. The south aisle was restored in very modern-looking Gothic in 1865, when the towers and a great part of the apse were also reconstructed.

The fountain by Montorsoli in the piazza in front of the cathedral, who designed the side-altars also, represents Orione, the pretended constructor of the city by order of Zancleo, a mythical Siculan king. It was executed in 1547-51, and is upwards of 25ft. in height, a triumph in three storeys, overladen with allegorical figures of the Nile, the Ebro, Tiber and the brook Camara, near Messina. His other fountain on the Marina with a figure of Neptune is poorer in conception and execution, though much lauded. Not far away in the Via Primo Settembre is the narrow façade of the Norman church of La Cattolica. An inscription calls it "the Mother of the Greek Churches." It has pointed arches with zigzag mouldings and carving of a later character on the caps. A little further away in the Piazza dei Catalani is the oldest Norman church in Messina, the Santissima Annunziata dei Catalani. Half of the apse is still visible in the Via Garibaldi—the caps are pleasing, and beneath the arcade are inlays resembling those in the apse of the cathedral of Pisa. It is said that the site was once occupied by a temple of Neptune, and afterwards by a mosque. Antique columns are used in the interior. The effect of the openings in the façade is damaged by a finicking dog-tooth moulding. At the side is a fine doorway with a three-centred arch, now leading to the Albergo del Genio, which looks almost Spanish or Portuguese. Similar doors are not infrequent in the Sicilian towns, and many examples may be seen in Taormina. They date from the fourteenth century. Another Norman church, S. Maria Alemana, is now used as a storehouse. Most of the remaining churches and the palaces are the work of the sixteenth and later centuries, and are not interesting. The church of S. Francesco was an exception, as it dated from 1251, but it was burnt down in 1884. The Rocca Guelfonia at the top of the town is said by local historians to be the ancient acropolis. Here the castle of the Mamertines is thought to have been; but, however that may be, there is no doubt that when Roger of Hauteville became master he strengthened the fortifications then existing and fixed his dwelling-place there when visiting Messina. Frederick the Second had his palace down by the harbour on the site now occupied by the Dogana.

(*To be continued.*)



WEST DOOR OF CATHEDRAL, MESSINA. DRAWN BY F. HAMILTON JACKSON, R.B.A.

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THE GEOMETRIC INTERPRETATION OF PHOTOGRAPHS AS APPLIED TO SURVEYING AND OTHER PURPOSES.*

By J. BRIDGES LEE, M.A.

FOR the purposes of this paper we may define a photograph as a light-printed picture on a plane surface, obtained with the aid of a good modern photographic lens. Any rules and principles applicable for the interpretation of a true photograph will be equally applicable to any accurate process-reproduction of pictures originally obtained by photography. Now the one great generalisation upon which the whole science of metrophotography mainly depends is the truth that all good photographs are mathematically-correct projections. The photographic projection is a true perspective, with the focal distance as distance line.

If the eye of an observer could examine any ordinary plane photograph through a small aperture at exactly the right distance in front of the picture along the correct axis of vision, then all points in the photographic picture would appear to occupy exactly the same relative positions as the corresponding objects would have appeared to occupy if observed by one eye placed at the station-point where the lens was placed when the original picture was taken.

For practical purposes we may consider that rays of light proceeding in perfectly straight lines from the object point have all passed on as straight lines through the station-point until they met the photographically sensitive surface inside the camera.

This is not quite what actually happens, because the apex of the cone of entering rays is rarely or never coincident with the apex of the cone of emergent rays. They are always separated by a greater or less distance along the principal axis of the lens; but if they are very close together (as in fact they generally are with the best modern lenses), and if the objects to be depicted are far away and the angle embraced by the picture of moderate amplitude, the maximum error which may result from treating the apex of the cone of emergent rays as the common station-point for images and also for objects will be infinitesimal.

Again, it is not of course literally true that all rays which reach the picture plane have actually travelled in straight lines from the object points. On the contrary we know that the lens has collected rays over a fairly considerable area, and refracted them, so that only a very small portion of the rays coming from the object points will succeed in travelling in approximately straight lines through the lens to the corresponding image points. But the resultant effect is as though the rays had all travelled in perfectly straight lines through a single point; in other words, the refracted rays are brought to a focus at the same points on the picture plane where the unrefracted rays meet it.

It is quite an easy matter to prove experimentally that a good photograph taken with a good modern lens is a true projection.

In a paper which the present author read before the Camera Club on December 7th, 1899, published in the Journal of the Camera Club for February and March, 1900, this subject was discussed at some length, and a simple experiment described for verifying the general proposition. Perhaps the best of all possible ways to prove that a photograph is a true mathematical projection is to observe that perfectly straight lines will always project on a photographic picture as straight lines or as points, never as curved lines, if the lens is good. It can also be ascertained by measurement that the direction and length of the images will always be exactly what they should be with reference to the direction and length of the object lines, and to the known laws of geometry and perspective.

It is quite necessary to get a clear mental grasp of the broad generalisation that all good photographs, large or small, are true perspectives. It is possible for photographs taken with a good lens to yield wrong impressions; to a casual observer they often do, especially what are called short focus, wide-angle pictures; but the mathematical projection is always right, and the pictures would look right if we could get our eyes to see them from the right points of view and to embrace so large angles.

Now, let us suppose it to be accepted and clearly understood that a photograph is an accurate perspective. It follows of course that all the laws of mathematical perspective apply to the interpretation of photographs.

Suppose, therefore, that we have the necessary data, we should be able to interpret photographic perspectives just as we should well-made perspective drawings. We must of course have the necessary data, and the subject should be suitable in order that the rules of perspective may be applied with advantage for the construction of ground plans and elevations direct from the pictures.

In a general way it may be said that most large human constructions in the shape of buildings, great engineering works, roads, canals, &c., could be fully measured and plotted in plan and elevation from photographic perspectives, as also could the outlines of lakes and bays or other natural level-surfaces.

There can be no doubt, however, that perspective, except as applied to simple geometrical forms and figures, is essentially a difficult subject to study, and a more difficult one to apply to practical use. People get puzzled and confused with a multiplicity of vanishing and measuring points, and construction lines often at very acute or obtuse angles, and excessive care and much time are necessarily required to produce really reliable results, so it may be feared that if we had to depend too largely or entirely upon regular perspective methods, such as are generally employed by architects and others, metrophotography would at best make only slow progress in popular favour. Fortunately we are not driven to depend on the inversion of the ordinary methods of perspective drawings for interpreting photographs. We can generally get along very well with a few simple rules of practice, which are based upon sufficiently simple theory.

Suppose, for example, that we fall back on the conception of a photographic picture as a collection of tiny dots or points, each one of which is on the picture end of a straight line which originally started from a corresponding object point and traversed the station-point on its way to the picture, where it terminated in the dot under consideration. It is then evident that if we can set up the picture again in its proper position with regard to the station, any straight line from the station-point to any point in the picture will be a true direction line from the station to the corresponding object point. It follows that the angle included between direction lines joining the station-point to any two image points appearing on the face of the picture will be the same as the angle between direction lines from the original lens station to corresponding points in the actual objects whose images appear in the picture. Similarly, projections of those rays or direction lines on any horizontal ground plan will correspond exactly with the directions of rays drawn on a plane table, when that most simple and popular instrument for surveying is used.

It is, however, altogether necessary, when working with photographs, to possess certain auxiliary information concerning them. A number of reliable reference data are necessary to be known before it is possible to set up a photograph in correct position for sighting and drawing rays towards it—if we decide to adopt this very simple method for obtaining directions and intersections on a plan—and it is equally necessary that these same data should be given or ascertained whenever we desire to interpret the photograph. For example, it is essential to be certain about (1) the plane of projection. This may be vertical or may be inclined at any angle to the horizon, provided we know the angle, but in a general way it is best to secure that the plane of projection shall be absolutely vertical. In this position of the plane of projection, all vertical lines will appear vertical, and the operation of plotting ground plans and elevations from photographs is most easily performed when the photographs are either truly vertical or truly horizontal projections. To secure a truly vertical position for the plane of projection the camera used needs to be correctly constructed, and must be fitted with accurate levelling arrangements.

Then (2) we must know the traces of the principal vertical and horizontal planes where these planes intersect the picture plane. These traces will need to be recorded either by hand or automatically, as hereafter described, and they must appear on the picture as straight lines intersecting at right angles. The principal vertical plane and principal horizontal plane intersect each other along the principal axis, which meets the picture plane at the point where the vertical and horizontal traces intersect.

That point (3) is the principal point. It is a point common to three co-ordinate planes intersecting at right angles to each other. It is the true geometrical centre of the picture, in the sense that if a circle of any radius be described on the face of the picture with that point as centre, all points in the circumference of any such circle will be at the same angular distance from the principal axis. The principal point is also the nearest point in the picture plane to the station-point, and the length of the straight line joining the principal point to the station-point is the focal length, or distance line.

If we imagine a sphere with the station-point as centre, and focal distance as radius, then the picture plane will be tangential to that sphere at the principal point, and it is evident that angular distances can be measured in any direction along the picture surface from the principal point by aid of a tangent scale to a circle of radius equal to the focal distance. The importance of being able to find the principal point with unerring certainty can scarcely be over-estimated. That point alone is the only true origin of the three co-ordinates, which are necessary for an accurate determination of the three space dimensions, which need to be ascertained if we wish to fix with accuracy the true position in space of any point whose image appears as a projection on the picture plane.

Most commonly the principal point is to be found at or somewhere near the middle of the picture, but it need not necessarily be there, and it may even be far away from the apparent middle region; but wherever the principal point may be it is always the true central point for reference, and the three rectangular co-ordinates already defined, which radiate from it, are the true co-ordinate axes, each one of which is common to two reference planes intersecting at right angles. The photographic picture, which is obtained in the camera, is a projection on a vertical plane from (4) a definite station which as regards the picture is a definite point on the principal axis at a distance from the principal point equal to the focal distance. The principal axis (5), as before explained, is an imaginary straight line coinciding with the intersection of the principal vertical and principal horizontal planes. It is perpendicular to the plane of the picture, and therefore the station, which is a point on this imaginary line, is a point standing out in front of the picture at a distance from the principal point equal to the focal distance. As regards the lens by whose aid the picture was taken, the station corresponds with the second nodal point, or the apex of the cone of emergent rays.

The station as regards the objects photographed was a definite point at the apex of the cone of incoming rays which penetrated the lens. For reasons before explained, this point may be regarded in most cases as coincident with the apex of the cone of rays radiating towards the picture.

Its position ought to be known or ascertained with care and accuracy by any of the ordinary well-known methods for determining the position of a station, and it is well to bestow a lot of careful attention upon the correct fixation of the station-points; but, all other methods apart, it is well to know that the station-points can be determined from photographs in the same way as other points.

To determine the position of a station on a ground plan it is sufficient to be sure of a few direction lines from the station to points whose positions are already known and favourably placed for this method of fixation, or station-points can be fixed by the intersection of rays from photographs taken at other stations.

Then it is evidently necessary to know or to find out by some means the (6) orientation of the view, which can be most conveniently ascertained if we know the orientation of the principal axis, which we already know is perpendicular to the picture plane at the principal point. For the rest it is highly convenient, and for some purposes necessary, to have a scale (7) by which to measure on the picture angles subtended at the station. Lastly, it is convenient to have notes on a picture immediately available for the specific identification of every photograph directly it is taken in hand. Such notes may be made to indicate (*a*) the station number, (*b*) serial number of picture, (*c*) index reference to point bisected by trace of principal vertical plane, (*d*) barometric pressure or altitude of station, (*e*) date, (*f*) hour, (*g*) magnetic variation, and so on.

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* A paper read before the Civil and Mechanical Engineers' Society on December 5th, 1901.

Before proceeding to consider how the photographs may be most easily interpreted with the aid of the reference data, let us turn attention to a specimen photograph, which bears on its face most of the information necessary for its correct interpretation (*see* centre plates).

The picture plane here was truly vertical when the photograph was taken. It can be seen that all the lines which we know to be really vertical in the objects depicted are also vertical in the picture. If the picture plane had been inclined, either backwards or forwards, the lines which are here vertical would have been neither truly vertical nor parallel, but either convergent or divergent, as every experienced photographer will know.

This picture was taken with an instrument similar to one shown by the accompanying illustration.

The verticality of the picture plane is secured by the construction of the instrument, and with the aid of the levelling screws and levels with which the instrument is furnished.

The station-point for this picture, as it now appears on the screen, is inside that lantern lens, and if it were possible to look at this picture with the eye placed where that lens now is, all directions and all dimensions would appear true and natural as though the real things were being looked at from the spot where the lens stood when the picture was taken.

The horizontal line right across the picture marks the trace of the principal horizontal plane, which contains the principal point and the station-point and all other points near or far which are on the same level as the station. Conversely, points which appears either above or below that line cannot be at the same level as the station, but must be higher or lower, as the case may be (when speaking of the same level as this place, account is not taken of the rotundity of the earth).

The vertical line marks the trace of the principal vertical plane. This plane also contains the station and principal point, and every point in that plane has the same azimuth as the principal axis. The intersection of those two planes is the principal axis, and the point where the traces of those planes intersect is the principal point.

The eye, being supposed to be at the station-point, will be looking straight along the principal axis, which, if materialised, would appear to the eye only as a point, and at the same time the two principal planes, horizontal and vertical, will appear edgeways if materialised, so that the two straight lines only will be seen as projections on the picture plane of their own respective planes.

The scale at the top of the picture gives an automatic record of the compass-bearing. The vertical hair serves as index, and it marks on the compass scale the magnetic bearing of the principal axis. The scale which stretches right across the picture is a tangent scale whose primary and chief use is to show horizontal angles at a glance. It serves also for the direct reading of the altitudes of all points in the principal vertical plane, and for reading unreduced angles in any direction from the principal point, the angle shown being the apical angle subtended at the station-point. This tangent scale also affords very ready and certain means for quickly and easily finding the focal distance for any photograph on which it appears, whether the picture be natural size or enlarged or reduced.

The equivalent focal length, or distance line, can be found geometrically by constructing a right-angle triangle, with a measured length of the tangent scale for perpendicular, to face an angle denoted by the measured length.

The base of the triangle will then be the focal distance. Or a measured length on the scale multiplied by the numeral value for the cotangent of the angle corresponding to that length will give the focal distance. The memoranda which are seen on the top corners of the pictures were made on slips of celluloid with ink and inserted in the camera before exposure, so that they and all other records were impressed and developed at the same time exactly as the picture itself.

Here then we have most of the necessary and useful reference data recorded automatically as latent images on the undeveloped plate, so that they spring into evidence at the same time as the picture to which they belong.

Most persons who have worked at the subject of metrophotography during the latter half of the last century have been driven to design special instruments for getting their pictures, because they found the ordinary cameras obtainable from the dealers of little or no practical use for accurate metrophotographic work, and all workers who have designed instruments have realised the necessity for having some definite guides to assist them in finding the principal point and the traces of the principal horizontal and vertical planes; but even the best designed of those instruments had no better arrangements for finding those essentials than by inserting pointers or cutting notches in the margins of the frames against which the photographs were pressed at the time of exposure.

The lines were afterwards ruled by hand between the images of the points or notches, and no other reference memoranda of any kind were impressed upon the picture at the time of exposure. One result has been that the operator has always had to attend to many observations, and to make numerous notes when taking photographs; and the risks of going wrong in various ways then and afterwards in the office were necessarily considerable. It has been the privilege of the author to originate the idea of impressing automatically on the picture at the time of exposure the most important and essential data for interpretation, and to design workable

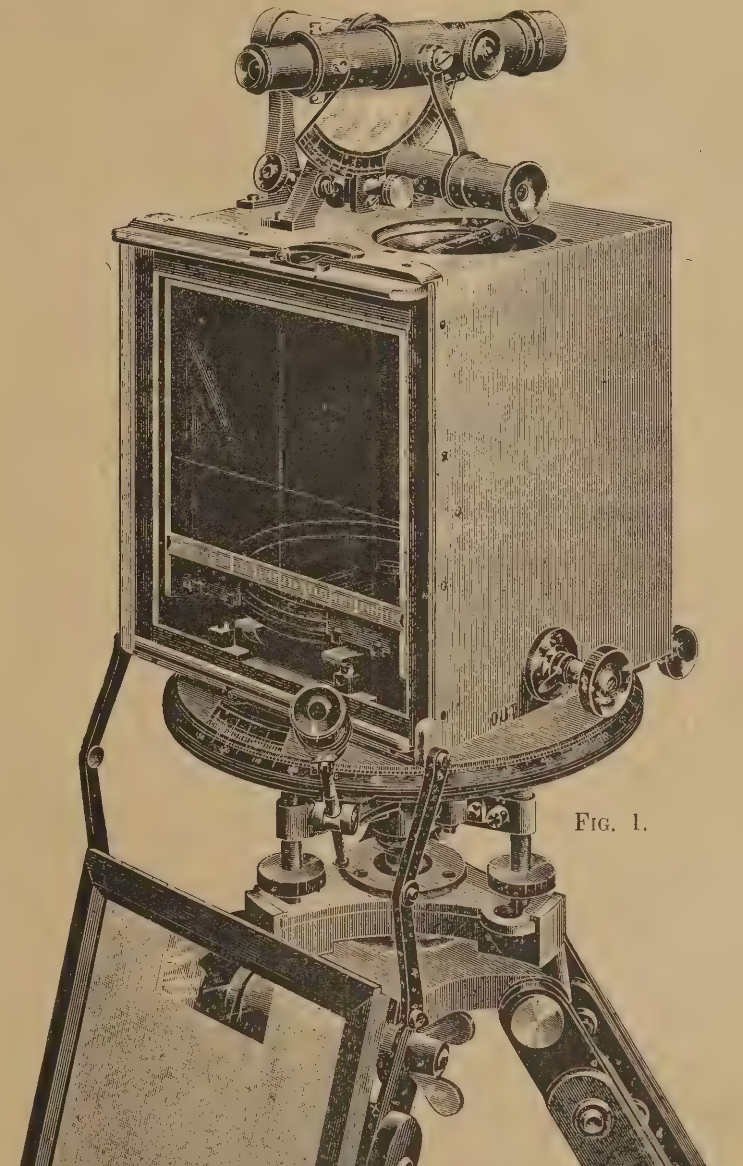


FIG. 1.

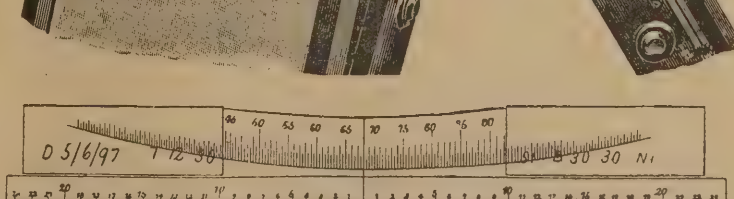
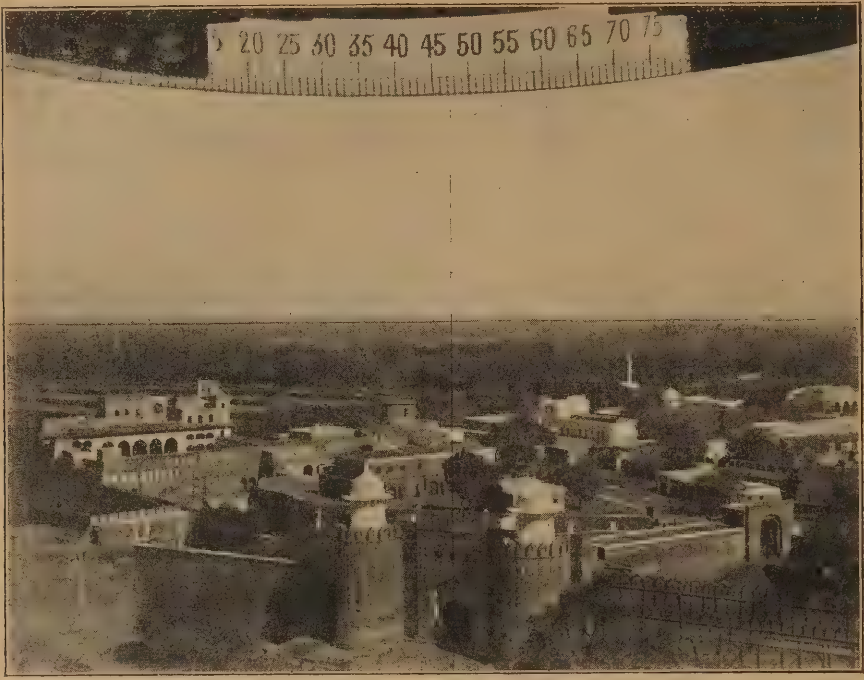


FIG. 2.

THE BRIDGES-LEE PHOTO-THEODOLITE.



PHOTOGRAPH OF FORT LAHORE, INDIA, TAKEN BY BRIDGES-LEE SURVEYING CAMERA.

mechanical means for carrying the general idea into effect in detail.

The earliest apparatus designed by the author for automatically registering the traces of the two principal intersecting planes and the compass bearing was made in 1894, and taken immediately to India. The accompanying photograph was one of many taken with that instrument. It is a view overlooking Fort Lahore. The tangent scale and other improvements have been added since.

One of the most important obstacles in the way of the rapid progress of practical metrophotography has been the great difficulty always experienced of getting efficient working tools.

The theory of metrophotography, which is really the theory of descriptive geometry and perspective applied to light-printed pictures, has been much studied and fairly well understood by experts, but the application of the theory to practical use has been difficult and puzzling, because of the multiplicity and complexity of the matters to be attended to and noted when using this method, and particularly at the time of taking the photograph. One chief aim which the author has had in view has been to simplify procedure both in the field and at home, and to secure additional certainty in results by substituting to a very large extent automatically-working mechanical arrangements for personal observation and record. It is possible to make a machine record data with extreme accuracy, and if the machine is in any respect out of adjustment the error will often be constant and can be detected and compensated, but human errors are more variable and cannot be so easily detected or compensated.

Time will not permit of any detailed discussion of instrumental appliances this evening; but before passing on to a brief review of some of the practical methods of working, it may be well to note that everyone who has devoted any serious attention to this subject has found that the ordinary photographic cameras of commerce are not adapted for accurate metrophotographic work, except under very limited conditions. The photographic camera has been fully developed as a toy by aid of which pictorial impressions are obtained with more or less apparent resemblance to the objects photographed, but for purpose of record a vast majority of the pictures which are taken have very little real value, and they cannot be interpreted for mensuration purposes, not because they are not true projections but because the key for the interpretation of those pictures cannot be found.

On the other hand, giving a suitable surveying camera, there is very little more trouble required to take good pictures which will be absolutely reliable records for all time so long as the pictures or reproductions from them continue to exist, and from which accurate surveys or exact detailed models can at any time be made of everything visible in the photograph.

The picture now on the screen (*see* centre plates S_1, No. 3, P_3) is a survey photograph overlooking Trafalgar Square, which presents a nearly full face view of the National Gallery as seen from a point on the roof of Drummond's Bank. The horizontal line in this, as in all other pictures to be shown, marks the trace of a truly horizontal plane containing the station point.

It is seen that it runs along the top horizontal ledge of the Gallery. The place where it cuts the monument is the same height as the top ledge of the National Gallery. If the view of the National Gallery were a perfectly full face one, then all horizontal lines on the full front view would be truly horizontal in the picture, and all vertical lines in this, as in the other pictures to be shown, are vertical, because the picture plane is always vertical. It follows, therefore, that all linear dimensions in a frontal view are exactly proportional to the linear dimensions of the object. The scale will vary with the distance of the object or with the focal length of the lens used, but all linear measurements will always be exactly proportional on object and image, and the ratio will be $\frac{d}{D}$, where d = focal distance and D = length of perpendicular from station-point to object plane.

The areas will, of course, be proportionate to d^2 and D^2. If we have a simple front view to deal with in any case all dimensions in the view can be easily read by aid of a pair of compasses and a scale, or by other elementary means.

A full front view of a plane surface is the very simplest possible kind of view to deal with. If the front view includes parallel surfaces at different depths or distances from the station, then, of course, the value of D varies, and the scales for different frontal planes will vary in inverse proportion to the value of D. In practice a very simple way to secure a good frontal view of a building is to set up the camera opposite the building, level it carefully, and then revolve the camera on its vertical axis until all horizontal lines in the building appear as truly horizontal lines on the ground-glass back; slight movements in rotation will cause perceptible changes in the directions of the images of the horizontal lines if those lines are near the top or bottom of the picture, and far away from the principal horizon line, which is the only line to remain always truly horizontal, whatever may be the azimuth of the principal axis.

It may be noted also that the area of the image is always largest with a frontal view. When dealing with buildings for measuring purposes it is best to use frontal views only as far as possible. It is not absolutely necessary that the lens should face the middle or any particular part of the building, but the plate should be parallel to the face of the building.

Next in point of simplicity to the image of a frontal plane surface is the image of a horizontal plane surface overlooked by the camera station: a lake, for example, or level ground like the interior of Trafalgar Square. The ground plan of a level area can often be plotted from a single photograph by ruling the requisite lines to divide up the area to be plotted into a number of horizontal squares in perspective, and then noting the particular squares in which particular points are to be found and placing them in their appropriate regular squares in a plan drawn on section paper. For this method of plotting it is necessary to know the principal point with exactitude, and also the two co-ordinate axes in the picture plane; and the station should be at sufficient angular elevation above the area to be dealt with, otherwise the perspective squares cannot be rightly placed or distinctly identified, and the plotting by this method will then become inaccurate. A much more general method of procedure is to plot ground plans by the method of intersections, and then to ascertain attitudes by observing the angular elevation as seen from the station point.

For plotting by intersection, views from two or more stations are necessary. It will be seen that this method is really a kind of plane tabling, and there is no reason why actual plane tabling should not be performed on magic-lantern projections in a room just as the same operations would ordinarily be performed on natural objects *in situ*.

There are, besides, very many instrumental and simple geometrical devices which may be used with advantage to assist in the correct interpretation and measurement of photographs; and in time, as the science and art of metrophotography continue to make progress in popular favour, other improvements also will no doubt be brought to light. But this is certain: that whatever future developments may bring forth, it will always be necessary to depend on exact knowledge of the position of the principal point and of the three principal co-ordinate axes. Orientation will always be important, and it will always be necessary to have indubitably accurate information from which the exact position of the station-point can be readily determined. Further, it will always be advantageous to have ready means immediately available for the measurement of angular distances from the principal point and azimuths and altitudes. All this information is invariably to be found on any photograph taken with any modern surveying camera, fitted as the camera has been fitted with which most of these pictures have been taken and which have been shown here to-night.

In conclusion it may be observed that good survey pictures are very accurate detailed records of measurable facts, such as no mere verbal descriptions can rival. A library of good survey pictures would occupy an excessively small space by comparison with ordinary books, and yield much more exact detailed information than any descriptions and drawings.

The operation of taking good survey photographs of large, and especially inaccessible, objects is incomparably the quickest and most economical way to gather full data for the mensuration of these objects.

Survey photographs can be obtained by any moderately skilled photographer, provided he is equipped with automatically-registering cameras, so that the master-minds of superintending architects, surveyors, engineers, and others, can work effectively in the office on materials collected from many places which they may not have been able personally to visit.

For municipal, antiquarian, architectural and land surveying records survey photographs will in time be regarded as indispensable.

The Kensington Memorial to Queen Victoria is to take the form of a clock-tower, to be placed in the centre of Kensington High Street, opposite St. Mary Abbott's Church.

Correspondence.

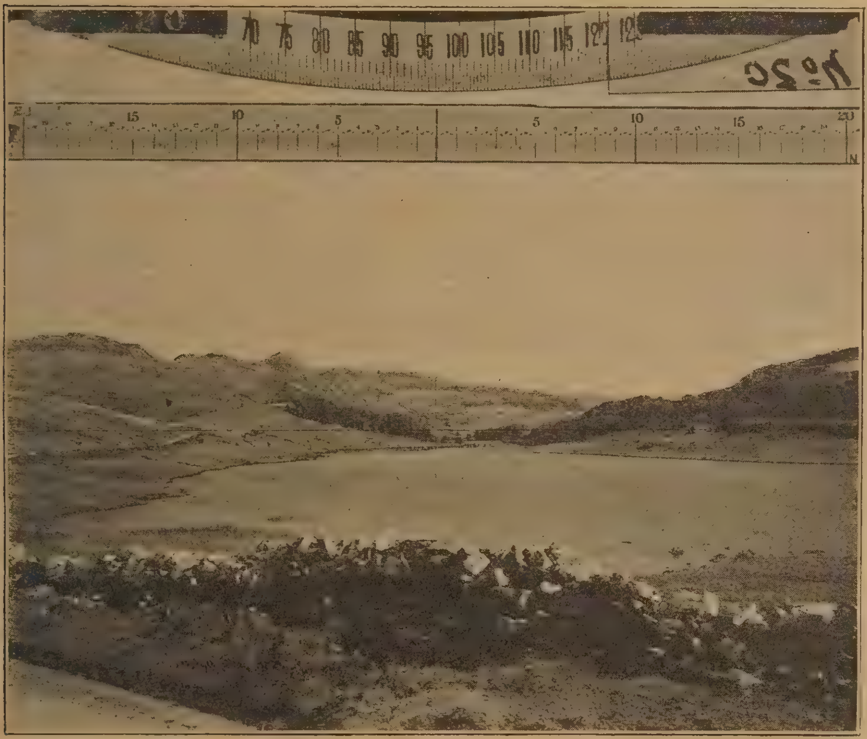
Army Works Reform.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In view of previous letters, the following hitherto unrecorded official matter will enable your readers to view the matter dispassionately. The sanitary condition of barracks impressed Mr. Campbell-Bannerman, when Secretary of State for War, with the necessity of appointing a specialist to counteract the ignorance of Royal Engineers in such matters. The Treasury, in reply to a letter requesting authority, said :—

Treasury Chambers,
Sir, 4th March, 1895.

In reply to Mr. De la Bère's letter of the 20th ultimo, I am directed by the Lord Commissioners of H.M. Treasury to acquaint you, for the information of Mr. Secretary Campbell-Bannerman, if it is the case that there is not a single Royal Engineer officer who thoroughly understands modern sanitary drainage, it appears to my Lords that they have no alternative but to sanction the continuance of Mr. Tyndale's services as sanitary engineer for a further period of five years, and they agree to his salary being raised from £400 to £500 per annum.



PHOTOGRAPH OF LAKE BALA, TAKEN BY THE BRIDGES-LEE PHOTO-THEODOLITE.

They suggest, however, it should be made a condition of the increase that Mr. Tyndale should instruct in sanitary science one or more young Engineer officers who might be attached to him as assistants, and learn his methods of dealing with large and difficult cases by personal observation.

I am, Sir,
Your obedient Servant,
(Signed) FRANCIS MOWATT,
The Financial Secretary, Secretary.
War Office.

A few months subsequent to this Lord Wolseley, commanding the Forces in Ireland, had occasion to report on the Royal Barracks, Dublin, scandal. He added the following post script dated June 5th, 1895 :—

This is, according to my views, a fair average specimen of the R.E. system of administration. I have long thought, of all parts of our system of military administration during peace that connected with the building and repair of barracks under the R.E. as designers and men of business most demands the attention of the military reformer . . . . I hope, however, it will be clearly understood that I am not finding fault with the officers employed, or those who directed their employment. My attack is not on them, but upon the system they do their best to administer. (Signed) WOLSELEY.

The belief that he is the man-of-all-work is instilled into the sapper's mind from youth upwards, until he believes in it as a species of false religion. It amounts to a description of fanaticism, *la folie des grandeurs*, which provides the corps with an exceptional proportion of eccentrics. These devotees are now impressing their reality on Lord Esher's Committee in shoals, but it is to be hoped that a clear-headed reformer like Mr. Brodrick will not rest satisfied with a report which will leave matters *in statu quo ante*, or, what amounts to the same, foisting military officers, at present incompetent, as permanent architects on the Barrack Department.

A similar Committee sat in 1862, which enquired into matters more minutely than the present one. It recommended that officers of Royal Engineers should seriously act as architects, and not rely on other officials whose duties should be distinct. They were given another chance, which has only resulted in a series of scandals, culminating in the present enquiry.

Before coming to a decision in the matter and evolving a new Works system, founded on the advice of Royal Engineers, Mr. Brodrick would do well to enquire into the very perfect one which exists in the German army, where the Barrack Department is civil and recruited from civil architects who have passed necessary Government examinations.—Yours truly,

ARCANA.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I am glad my former letter has called forth such excellent epistles as those of "Balbus" and "Thorough." Permit me to now add the following :—

Belfast.—New barracks have been erected at Holywood, about three miles from the city. They were only completed about a couple of years ago, yet in defiance of modern sanitation the sewage from them was openly discharged on to the foreshore of Belfast Lough without any attempt at purification. At low water this foreshore stretches for nearly half a mile, and the stench from the sewage in hot weather is described as intolerable. This affects not only the health of the troops quartered just opposite this outlet, but also that of the inhabitants of the town of Holywood itself, as well as the users of the rifle-range between a portion of the barracks and the shore.

Chatham.—Upwards of 300 men were housed in 1899 in the underground rooms of the Brompton Barracks, Chatham, which were ill-lit, ill-ventilated, and like cellars. This was a disgraceful state of things after the enormous votes of money for barrack-building during recent years.

Cyprus.—The housing of the troops in this island is lamentable. The offices, married-quarters and barrack-rooms are rough wooden huts, which are neither waterproof nor windproof, and present a disreputable appearance. The condition of the buildings is the more remarkable inasmuch as the native troops are lodged in comfortable stone buildings. A good deal of money has been spent in the last few years for engineer services at Cyprus, but the Royal Engineers were only represented at the station by a military foreman of works, who has been there about ten years and did just as he pleased.

Dover.—A short time ago some of the barracks were burnt down, owing to the proximity of the end of a purlin to a chimney flue—a piece of bad construction which every architect specifies against. When the town fire-brigade arrived it was found that the barrack hydrants would not fit the couplings of the town hose. One would have thought that even a Royal Engineer would have considered this. As far back as 1860 a civil architect, named Salvin, was employed by the War Office to design some barracks at Dover to harmonise with the adjacent ancient buildings ; he also carefully prepared a specification : yet when the documents were put into the hands of the Royal Engineers for execution they made the usual hash of the job, and the walls were so damp that the rooms were uninhabitable. It was found out afterwards that the amateur military architects did not understand the construction of rubble walls.

Dublin.—Everybody knows how £100,000 were absolutely squandered on the Royal Barracks, Dublin, between 1891 and 1893. The reconstruction of these buildings was undertaken because of the defective planning and bad drainage, for there were 127 cases of enteric fever in the Royal Barracks from January, 1879, to August, 1889. The Richmond Barracks were almost as notorious; and in the report made by Mr. Rogers Field, M.I.C.E., in 1889 he stated that forty-five cases of enteric had occurred between June, 1883, and June, 1889. The foundations of the buildings were found to be shallow and ragged, and there was no damp-proof course. The stone was so inferior that it crumbled away, and portions of the buildings had to be rebuilt. The subsoil water was not taken away, and among many sanitary defects two urinals were directly connected with the water main.—The reconstruction of the Portobello Barracks was to have cost £80,000, but this has been greatly exceeded. It was here that the Royal Engineers were responsible for bedding bricks in red lead—a novel way, certainly !—At the Marlborough Barracks our military friends were warned that English bricks would not stand the Irish climate, yet they insisted upon Essex bricks being used. They were dearer than the bricks made in Ireland, and there was the cost of carriage in addition. The Essex bricks did *not* withstand the Irish climate, and soon began to decay. In a short time these buildings will have to be reconstructed or patched up, although only erected about ten years ago.—The usual tinkering is going on at the old-fashioned Island Bridge Barracks, which it would be cheaper to sweep away altogether and replace by modern buildings. The engineer officer in charge of this work is seldom at the office, and the assistant surveyor really works the division. In building the new mess-room Mansfield stone was specified instead of a cheaper and equally good Irish stone.

London.—The barracks in London bristle with examples of incompetence ; and the unsatisfactory drainage of the Wellington Barracks, Knightsbridge Barracks, &c., is well known. "Nothing is sacred to a sapper," not even the historic Tower, where a hideous brick barrack was put up in close proximity to and within the walls of our ancient fortress. Surely some architectural style might have been used under such circumstances.

Salisbury.—About 600 iron huts have recently been erected on Salisbury Plain, yet the roof-ventilators let in snow and rain. To rectify this will cost £20 per hut, or £120,000 altogether. A contract has now been entered into with a Wolverhampton firm of builders to provide barracks for eight battalions of infantry, and the contract amounts to a million!

Sheerness.—Garrison Point Fort at Sheerness was set out in a wrong manner. The Royal Engineer officer who laid it out, instead of setting out the magnetic deviation to the proper side, doubled the error and set it out the wrong side of north. One gun is useless. Another new fort at Barton's Point has position-finding towers on either side which can be seen miles out to sea, so that the enemy has only got to shoot between these towers to hit the fort.

Singapore.—A general muddle was made of the barracks put up about five years ago, and the same system is going on. The colony paid for the buildings which were erected for the native or local troops, but the designs and superintendence were carried out by the War Department. There were actually separate contracts for the brickwork and part of the timberwork, another for the doors and frames, another for ironwork, &c. The result was appalling, as the brickwork had to stand still till the frames arrived, the ironwork to wait on the stonework, frames were made by mistake too large for the intended openings, and on one block a climax was reached by letting out a part of the flooring and joists to one contractor and the remainder to the building contractor. Bolts were put on the outside of latrine doors, scaffold poles from the lower floors were allowed to run through the concrete of the upper floors, &c., &c.

Southsea.—The Cambridge Barracks were sited so as to face inwards towards the barrack square, instead of outwards to the road as shown on the drawings.

The foregoing instances and those given previously by your other correspondents are sufficient to show any person that the department needs completely reforming. In 1883 returns called for by General Sir Andrew Clarke, R.E., Inspector-General of Fortifications, demonstrated that the cost of designing and superintending the erection of barracks amounted from 12 to 25 per cent. of the cost of the works executed. By a letter dated March 7th, 1899, the War Office announced that Sir John Taylor, Chief Surveyor of H.M. Office of Works, had been asked to inspect barracks and advise upon their construction. He only inspected a few, and his report was not published. In any case, he could only see the outside of things, and would know nothing about administration or staff or scandals, on which he was *not* asked to report. Of course his perambulation was a farce and a mere blind, so that the Royal Engineers could hoodwink outsiders with his congratulatory missive. Royal Engineer officers generally lie low and say nothing, but sometimes one is found to be candid enough to give his private opinion. For example, Colonel B———, Commanding Engineer at Portsmouth, when he came on the works, said: "Oh, I suppose it's all right. I know nothing of buildings." A Division officer once stated: "There are lots of regimental officers who are better military engineers than we are. Here I am pitchforked into a department of which I know nothing after years of military life."

Many of your readers would like to know the names of the civil architects who really design our barracks and for whose work the Royal Engineers get the credit. Here are a few:—The late Mr. J. Mecheleu Rogers, A.R.I.B.A., who designed the whole of the new Clarence Barracks and Cambridge Barracks at Portsmouth; Norwich Regimental Depot; Grangegorman Barracks, Dublin; and barracks at Aldershot, Colchester, Dover, &c. Mr. Walter Tregellas, Mr. H. O. Cresswell, Mr. Meunie, Mr. G. Rayner, Mr. G. Simmons, Mr. Ingress Bell, F.R.I.B.A., &c., formerly employed at the War Office. Among those now employed may be mentioned Mr. T. Rogers Kitsell, A.R.I.B.A., architect of the new barracks on Plymouth Citadel; Mr. Thomas Davison, A.R.I.B.A., architect of the Aldershot Hospital; Mr. T.C. Yates, A.R.I.B.A., architect of the Curragh Water Tower; Mr. W. Blount and Mr. Mally, designers of the Holywood Barracks, Belfast; Mr. J. C. Dewhurst, A.R.I.B.A., Mr. R. Temple, Mr. H. Roper, Mr. J. Walsh, Mr. J. Mitchell, Mr. J. S. Rogers, Mr. H. Hughes, and scores of others stationed all over the country at various military places. All these professional men are merely called "draughtsmen," and are barely mentioned in the Regulations for Engineer Services lest somebody might be too inquisitive. Their pay is very poor and varies from 6s. to 12s. (in a few cases 15s.) per day. If the Royal Engineer Department does not need reform I do not know which branch of the Public Service that does.—Yours truly,

REFORMER.

Horace Walpole's Villa at Strawberry Hill.

To the Editor of THE BUILDERS' JOURNAL.

TWICKENHAM.

SIR,—Allow me to correct the reply given by "G. A. T. M." to the enquiry on this matter in your last issue. Pope's Villa and Walpole's Villa are two separate houses, not one place as stated by "G. A. T. M." Pope's Villa (the residence of Mr. H. Labouchere) is on the road—Cross Deep—which extends from Twickenham Town Hall to St. Alban's Church, Teddington. Walpole's Villa is on a turning out of this road in the direction of Strawberry Hill Station. About five minutes' walk separates the two places.—Yours truly,

ALFRED BURGESS.

Designs for Proposed Houses.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, N.W.

SIR,—I was much struck with the designs for houses at Pinner and Ealing published in your last issue, as they so well represent the present idea of rural domestic buildings. My principal, however, is an old stager who is always talking about the work of the great men of the past and the desirability of aiming at noble and monumental architecture even in its simplest form—a cottage. But when I begin to practise on my own account I want to make money by following the vogue ("craze" he calls it); and when I ventured to ask what he thought of these designs he laughed, and said: "Bless me, boy, can you not see they are very clever caricatures published as warnings what to avoid if you would help to raise architecture out of its present deplorable condition!" And then he went on: "You must remember some former caricatures in the BUILDERS' JOURNAL where there were clouds formed of ink lines $\frac{1}{16}$in. thick, supported on the chimney-pots and the funny trees—clouds such as you saw in some of the recent R.I.B.A. competition exhibits. It is all done to show you what to avoid, and you should be grateful to the modern draughtsman for the lesson." Sir, I don't know what to think of it, or of him. Is he "kidding" me, if you will pardon the colloquialism? How am I to know when a "goak" is intended?—Yours truly,

A PUZZLED TYRO.

To the Editor of THE BUILDERS' JOURNAL.

EDINBURGH.

SIR,—I am greatly concerned about the design for "The White House, Ealing," published in your last issue—more especially about the elevation (whether back or front, one is left to imagine!). Is this meant for students to study? Is the future to see all rules of proportion and ideas of symmetry discarded, and what might at least have been inoffensive reared up into an unshapely-looking mass—as, say, this elevation? What shall we say of lopsided gables; windows of all shapes and sizes, if possible at different levels—half-a-dozen at least in a row and the remainder of the wall a dead mass of red, white or perhaps blue plaster-work; chimney heads like primitive factory stalks, surmounted with cans taller than the length of the windows; roofs designed principally to supply the cats of the district with a rendezvous? As to the draughtsmanship—should we (students) cultivate a taste for this style, and then endeavour to acquire it? Is high-class printing the most difficult to read? When preparing drawings of this type, are the shrubs and tubs, &c. (not to mention woods and thickets) supposed to be included in the estimated cost?—Yours truly,

ONE OF THE YOUNG MEN.

Bricks and Mortar.

APHORISM FOR THE WEEK.

The simplest and least-embellished edifice, if it have the merit of just proportion, will produce a satisfactory impression; whereas the most decorated buildings, if devoid of proportion, can never be beautiful.—MILIZIA.

Some Old Tapestries. AT the Victoria and Albert Museum, South Kensington, one of the best of the tapestries from Hardwick Hall is being exhibited for a short time (by permission of the Duke of Devonshire) in the Tapestry Court now that the necessary repairs and restoration to its original form have been completed. This tapestry is probably one of the most magnificent of its kind in existence. Its actual origin is unknown. This portion of the Hardwick tapestry has a romantic history. Bess of Hardwick finished the Long Gallery—the longest room in England—in something like haste, and covered the bare piers and deep embrasures of the windows with hangings made by cutting up into strips the tapestry from old Hardwick Hall. The Duke of Devonshire has had these strips taken down, cleaned and reconstructed; when it has been found that they make up into four complete pictures, forming a consecutive series of "verdures," or scenes of hunting and sport of every kind. The piece now exhibited is about 15ft. in height by 35ft. in width. The colours are wonderfully well preserved. The labour of restoration—or, more correctly, remaking, for nothing new has been introduced into the design—has been excellently carried out by members of the Decorative Needlework Society, 17, Sloane Street, under the direction of Miss E. Gemmell. There are about forty threads of warp to the inch, and the ends of each of these had to be drawn out along the sides of each cut, matched together, spliced and then replaced.

The late Mr. F. W. Hornblower. THE death took place on December 31st, at his residence, 58, Park Road, South Liverpool, of Mr. Frederic W. Hornblower, architect, after a long illness. Deceased was the eldest surviving son of the late Mr. Lewis Hornblower, with whom he was associated in practice for many years in Liverpool, and who died in 1879. He was articled to his father in 1864. Mr. Hornblower ceased to take an active part in his profession about two years ago in consequence of continued ill-health. The deceased, who was a native of Birkenhead, had achieved considerable distinction as an architect. He was associated with his father in the laying-out of Sefton Park, Liverpool, 375 acres in extent—the most extensive park since Hyde Park; and their joint plans were awarded the second premium for designs for similar work at Roundhay Park, Leeds, over 400 acres in extent. The deceased was also successful in taking the second place with the plans which he submitted in conjunction with Mr. Francis Usher Holmes for the Government Museum of Natural History, National Library, and School of Art Buildings at Dublin in 1885, the first place being taken by an Irish architect. He gained with his father the first premium in the competition for the enlargement of Liverpool Corn Exchange Buildings, and also the second premium in the competition for rebuilding the Liverpool Stock Exchange. In 1886 he was awarded the first place for municipal abattoirs at Birkenhead, and the second premium for laying-out the Kidston Hill Estate, Cheshire, for Mr. Vyner (over 300 acres). He carried out with his father a very extensive "model" village on fireproof principles at Millom, Cumberland, for the Hodbarrow Mining Company, and laid out with him a building estate some hundreds of acres in extent near Preston. The late Mr. Hornblower was also entrusted with the execution of a large amount of private work, among others by the members of the Laird family, Lord Brassey, Sir Thomas Brocklebank, Sir F. G. Hesketh, Bart., &c. He also took a prominent part some years ago in the reconstruction of the Liverpool Architectural Society, of which he was for eight years hon. secretary and subsequently a vice-president.

THE USES OF MORTAR AND CONCRETE.*

BY WILLIAM WATTS, M. INST.M.E., F.G.S.

LIME is the oxide of a metal known as calcium, and in combination with carbonic acid gas exists in great abundance in the earth as chalk and limestone, known to chemists as carbonate of lime. Before it can be made into quicklime, however, it must be burned in a kiln and forced to part with its carbonic acid and water. It is then said to be anhydrous, that is, waterless. Before mortar can be made of burnt lime the lime must be slaked by restoring to it the water which was roasted out of it in the kiln, and must afterwards be mixed with sand, and further allowed to absorb carbonic acid from the air. During this chemical combination it becomes harder by forming silicate of lime, and serves to bind together masses of masonry and brickwork in that mysterious manner known to us all. It requires longer to harden or "set" in thick than in thin walls, but is all the better for setting slowly if good material be used.

Lime was unknown to the ancients, and was used but sparingly in buildings erected three hundred years ago in England. The earlier Greek, Egyptian and Roman buildings were constructed without it; probably the discovery had not then been made, and history is silent as to the period when mortar was first used in building. It was first employed in the East and gradually found its way westwards as civilization advanced. The use of mortar did not introduce a better class of masonry, of which we have evidence in the cyclopean structures of the Greeks and the older aqueducts of the Romans. It would be introduced slowly, and long years would elapse before it came into general use owing to the difficulty of procuring its constituents, as is evidenced in the early history of the art of modern building.

The use of mortar enables rubble or undressed stone to be more generally employed and the middle of walls better filled. It saves labour by enabling masonry not squared true on the bed to be set level; and it protects the arrises of the lower courses of a building from being broken, as the weight of the superstructure is more slowly applied. It requires very great care to dress ashlar true on the bed to take even bearing and to be made weatherproof unless the walls are made very massive, as was the custom in former times.

Hydraulic Lime Mortar.

Eighty years before the birth of Christ, Vitruvius is said to have used mortar for setting under water, but we have no evidence to show how far it was successful as a hydraulic lime, nor have we any authentic evidence that he understood the chemistry of lime. The properties of lime for setting under water remained unknown until the middle of the eighteenth century, when Smeaton first gave an impetus to its use. He saw more clearly than any other engineer before his time what was required; and as his works remain lasting monuments of his skill, he is, I think, justly entitled to be called "the father of civil engineering." The manufacture of cement, however, is not thoroughly understood even to-day. From time to time we read in our official journals of improvements being introduced in compounding and calcining, and in the selection of more suitable machinery for grinding, in order to produce a cement which will strengthen with age. In the use of cement opinions vary, and the old battles of theory versus practice are still being fought as fiercely as ever by engineers and architects, not only in the professional but in the daily papers. We are greatly indebted to the late Dr. Dalton for his researches and consequent improvement of our scientific knowledge of the art of making lime.

Mixing, and the Use of Mortars.

My remarks on mortar refer to slaked lime reduced to a paste and made ready for mixing with sand. The practice of mixing mortar varies considerably, but engineers who have studied the action of hydrates know that rich limes require to be exposed to the air before being used, to enable them to take up the carbonic-acid gas present in the air and water, and in order that they may get rid of the unslaked particles and gain strength. When thoroughly cooled, both lime and cement lose the power to swell and lift masonry; but the exposure may be too long, in which case it weakens the material. Cements "blow" in consequence of too much silica being mixed with the alumina to form the compound; the blame then rests with the burner, and not with the engineer or architect responsible for the works. I have known brickwork set in cement swell in a wall three weeks after setting, even after the cement had cooled in the shed for six weeks. This is an exceptional case, however; but experience is based on rare occurrences, and the retentive mind will profit by them. As a rule, the lifting acts slowly and to a less extent when the cement is mixed with sand. There are no tests for limes and cements by which the quality may at once be ascertained, and engineers in charge of public works have to fall back upon their experience, a faculty sometimes wanting in the younger members of the profession.

There are several testing machines in the market for ascertaining the tensile and compressive strains of cement, but they do not tell all that is required to be known, and, like some wordy specifications and tabulated figures one sometimes sees, are of little practical value. The composition of cement varies considerably in spite of all the care exercised by the manufacturer in producing it. It is affected by age and percentage of residue, and weighs less in proportion to the degree of fineness after sieving. The addition of sand weakens cement-mortar. Fine sand of equal value and quality is better than coarse sand, and shows higher tensile and compressive strains. The following table, copied from Trautwine, shows the extent to which sand weakens cement :—

Sand -	0	½	1	1½	2	3	4	5	6	7	8
Strength	1	2/3	½	·40	1/3	·30	½	1/5	1/6	1/7	1/8

Both cement and lime mortar made in the proportion of 2 to 1 may be relied upon when proper care is observed in the mixing. An inferior quality should not be used in exposed situations. Cement-mortar is rarely used in buildings of a temporary character, but permanent work of any kind is worth doing well. In setting ashlar and bricks the beds should be made clean and moist before bedding them, in order to induce proper adhesion of the mortar particles; the surfaces are none the worse for being left rough so long as they are dressed true. Common mortar should never be used in damp situations, as it absorbs moisture freely, and does not harden, but remains rotten, and in course of time drops from the walls. The practice of pointing with inferior material is a mean way of finishing work, and should not be encouraged. It is much better to use good mortar set flush to the front and then pressed firmly in the beds with a suitable "jointer." Mortar is much impaired by frost, and should not be used when "Boreas" blows keen over the land. Neat cement is less affected, but even this is more or less disintegrated if employed in exposed situations. Cements and lime should not be mixed together for outside pointing; they make a good paste for handling with the trowel, but the rate at which the two ingredients set is not equal in point of time: the molecules of the stronger pull the weaker ones asunder, and both are affected, to their disadvantage. Roman cement makes a better paste for pipe-jointing than Portland, not because it sets harder, but because it is more adhesive, and therefore less is wasted in the work. Referring to hydraulic mortars in general, no more should be mixed than is required for immediate use. Its primary strength cannot be recovered on mixing a second time. It will harden, however; but it is "short," and disintegrates sooner than when manipulated once only. Brick-setters prefer mortar worked up a second time when using wet bricks; but after the crystallising forces are once brought into play, they lose their mysterious power if checked in their silent building up, and do not regain their normal strength.

Mortar is weakened if too much water be used in mixing it, but account must be taken of the season of the year and the quality of the sand, lime or cement used, all of which concern the handling of the mixture. It is difficult to prepare a mortar to suit every class of work and weather; and while rules may be laid down as a guide in preparing the mixture, its setting properties must be judged by use on the works. Good mixing is important, and the selection of clean sand and water should be insisted upon; mine-dust and well-ground cinder ashes are good for masonry and brickwork generally, but they are not recommended for use below ground. The rich or "fat" lime is often spoiled in slaking for the want of sufficient room and water and energetic stirring. Buxton lime swells to about three times its original bulk in the process of hydrating, and unless the slaking pit be made large enough, dry lumps remain in the paste and cause a waste of material. One rarely sees the walls of a newly-plastered house without lime blotches in them. These are the pieces of unslacked lime asserting expansive power in the opportunity now afforded them of taking up additional moisture. Properly-slaked lime will keep for centuries and improve with age, especially if kept covered with water; builders generally very much neglect slaking and making the best use of lime. Labourers of the lowest intelligence are frequently employed to mix and proportion the sand and lime without proper gauge-boxes being provided. In my opinion the municipal authorities of every town should provide and maintain public lime-slaking works, where good lime properly seasoned could be obtained by local builders, and the use of no other material should be sanctioned unless it were proved to be of standard quality. This suggestion may be objected to, but surely it is the duty of everyone building homes for the people to erect them substantially and make them worth looking at and fit for occupation. The Romans had a good municipal rule bearing upon this subject. They made it compulsory on every builder that no lime should be used in any building unless it had been slaked at least three years. No wonder they had such good walls, fit to receive and retain any colour of paint placed upon them. There are particles in all limes which require longer time to slake than others, and unless the whole be thoroughly hydrated it swells, as previously pointed out, and defaces the work. Whether it is better to use steamed or slaked lime must be left to the judgment of the architect; but no lime should be used in a heated condition either in the foundation or the elevation of a building. Good material and work can never be put in the wrong place, seen or unseen, and this idea cannot be too strongly impressed upon the minds of all builders.

In masonry walls grout cannot be too freely used for binding together the "filling in" of the middle; the fillings, however, should not be put in dry, but each stone should be carefully bedded in mortar before the grout is poured on. The grout should be made of the mortar of which the wall is built, and of a consistency which will enable it to flow freely and fill the interstices that may have been missed by the trowel. The liquid should be poured out of a circular spout and carefully stirred while flowing (this mode of delivery steadies the flow, confines it, and assists in regulating the quantity required). Where great density is necessary, iron borings may be added with advantage, not mixed in the fluid, but hand-sieved upon it as it leaves the spout. These instructions may seem unnecessary to some persons, but careful observations and deductions have shown me the wisdom of paying close attention to small details. Every useful piece of work intelligently designed and conscientiously executed is a monument of a lasting character for which our descendants will give thanks. My experience, which is now a long one, has been confined to the construction of important waterworks; and architects engaged in making small towns great ones may look upon some of my suggestions as difficult to carry out in their profession. In the main my work has been in the ground and in building to resist the static pressure of water; your work is, for the most part, built above the surface, exposed to atmospheric agencies and the gaze of man—indeed, for his dwelling-place and social intercourse.

Concrete.

During the last twenty years some of the advantages of a freer and more extensive use of concrete have become patent to the profession. In my opinion, however, its adaptability for various classes of work entitles it to much more extensive employment. I do not advise its use in elevation above the ground, but freely in works below, where the matrix seems to find its natural place. For foundations in damp situations concrete has no equal, but it looks cold and uninteresting in elevation, even in promenade sea-walls. I would use it freely in cellar foundations, for floor and side walls, and I would also employ it freely for arch-sheeting, not in preference to ashlar quoins but in preference to bricks. It lends itself to this class of work admirably, and is much cheaper when suitable concrete-stone is at hand for making it. Three of the arches on the Langsett tram-line are turned with it, also the intermediate arches at Mortimer Road resting on steel girders; and although a 30-ton locomotive has daily passed over this 30ft. span bridge for nearly four years not a hitch has appeared, although critics anticipated a failure. There is probably no structural bond so good as well-set brickwork, and no mass so solid and impervious as concrete. It is extensively used for large engine-beds, and is replacing ashlar masonry for this class of work; it is less dense, however, but this may be an advantage, as the continued vibration may find a more easy cushion on which to react and thus prolong the lives of prime movers. I know no better material for light-arching and footbridges, and it has advantages for collieries; if made from hard shale and cinder ashes, it is most suitable and economical for use in the construction of temporary erections.

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* A paper read before the Sheffield Society of Architects and Surveyors on January 9th, 1902.

Cement will bind and amalgamate with all kinds of durable materials, regardless of colour or shape, if they be broken small enough and provided with sufficient fine admixture to form a gelatinous mass. Burnt-shale concrete is an excellent ingredient for many kinds of work which architects and engineers are called upon to execute. It only requires bringing to the front and giving a fair trial to commend itself to the profession generally. I do not, however, recommend it for work having to resist great compressive strains, but in breast or burr walls, for backing, and similar less important jobs where the facing is of stone or bricks. Backing of this kind is infinitely better than coarse rubble or damaged bricks carelessly built regardless of bond or bed. Some of the walls built in front and at the back of gentlemen's residences, supporting as they do in many cases garden plots and lawns, are out of plumb-and-line for the want of better backing, and because they have been thrown together rather than built. Nothing looks more distressing than well-dressed wall stones shabbily built and oversetting or bulging out, as the case may be, simply for the want of a little more care in building and in the selection of the material for both sides of the wall.

Burnt-shale made into concrete as suggested should provide a good foundation for street-paving. There is an abundance of it available where collieries exist, and if given a fair trial I am sure it would prove satisfactory. The refuse from a town destructor should also make excellent concrete, especially if a little clean sand or gravel be added to consolidate the mixture. It is wasteful to tip broken bricks, stone scapplings, pots, glass bottles and garth iron down the spoil tips of any large town. If collected, this waste product, when cleaned and broken sufficiently small, could be used as concrete for the foundations of many buildings, and would form a more solid bed than the dry rubble and rubbishy bricks one sometimes sees used for this purpose. I have often thought that the waste slag from ironworks could be utilized for the foundation of roads, with a thin layer of fine concrete placed upon it to form a level bed, or even fine broken stone where the traffic is slight and cost a primary consideration. I have noticed that the president of your Society has used iron slag in paving a river-bed at Stocksbridge, which seems to answer admirably, and I am not sure whether he has not also used it for backing in a breast wall. This class of waste material is like a wayside flower—too common to be noticed, gathered and made use of. "If the stars were seen once in a thousand years how men would believe and adore, but every night come out those envoys of beauty, and light the universe with their admonishing smile."

I come now to consider the more important use of concrete in large engineering undertakings, and mainly in concrete trenches and embankments for reservoirs. English hydraulic engineers have been slow in adopting concrete as a foundation material for deep trenches. Why this is so I do not know; either extreme caution has been the motive, or want of experience in its use. In every new departure from old and tried customs cautious men proceed slowly. Caution is a virtue if not carried too far, when it becomes weakness. Men of genius try new methods, and deserve our thanks and sympathy even if they fail. Concrete trenches for reservoir embankments are better and much cheaper than puddle trenches. (The lecturer here referred to a diagram showing three typical trenches adopted by present-day engineers. One was the old type of puddle trench, without any protecting cradle of concrete; another, the form of trench adopted in the Little Don Valley works; and the third, a modified form of the other two, in which the puddle is sandwiched into the concrete at the bottom, and concrete walls are carried sufficiently high on each side to protect the clayey matrix from the action of springs which exist under considerable static pressure in nearly all trenches. The concrete trench being the cheapest, the lecturer compared the cost of the other two with it, and found that a trench similar to the first costs 34 per cent. more per lineal yard, and one similar to the third 46 per cent. more; in which comparisons a length of 200yds. was estimated, including the cost of timber, cement, stone and labour of every kind pertaining to the work. The trench was 60ft. deep in each case. The first cost £159 per lineal yard, the second £119, and the third £174. These details were given by the lecturer more particularly because it is generally understood that concrete is more costly than puddle, which is not a fact when the circumstances of the work and situation are taken into account.)

Concrete below the surface of the ground has many advantages over its clay rival, especially in bad ground where springs exist and have to be driven back into the solid measures on either side. A concrete trench is opened out sooner than a clay trench twice or three times the width, and the refilling may commence at any part where the substrata are bad or a large influx of water exists. The concrete matrix, when properly treated, becomes as solid as masonry and as impervious as clay. At whatever angle rock may dip on either side of a trench it cannot force its way through concrete, as it has been known to do in trenches of clay, which have had to be taken out again and a fresh start made with the work. These are a few of the advantages of the use of concrete over clay puddle in the trench of a reservoir embankment; and others could be cited. I recommend great caution in arriving at a decision as to the respective merits of a concrete dam across a valley in lieu of an earthen embankment. It is easier to make and contains fewer details, and though it occupies longer time in building than an earthenware embankment it is not any more enduring. The geological features of all valleys are not favourable for concrete dams being erected in them. Depth is always an element of danger in the storage of large volumes of water, and an engineer is not justified in incurring risk for the sake of novelty, however tempting the site may appear. Ideas and desires in these matters should be subservient to experience in every detail. A good reservoir, whether constructed of earthwork or concrete, is worth more than all the jewels a city contains, and the choice of site and material to be used require serious thought and consideration; their selection should not be entrusted to inexperienced hands. I am not sure that the Pennine buttresses in the deeper valleys above the saturated level are at rest for all time, at least on the dip side. I have observed that slow movements have occasionally taken place in masonry of the best possible character built on rock foundations. Cracks have appeared in an irregular manner for which a slipping and not a subsiding movement only can account. Architects know very well that any subsidence in a foundation is more intensified and apparent in good work than in bad; and this has suggested the idea of keeping the top of the concrete in the trenches in the Little Don Valley well below the line of thrust of lateral movement, and also below the thrust of the made part of the embankmen This is not the time or place to enlarge up this very interesting geological phenomenon. daresay some of the Sheffield architects w have noticed that buildings on one side of valley are more liable to give way or crack th on the opposite side. This observation is wor making for the value of the information it fu nishes in the selection of sites for buildin especially lofty ones.

Concrete and masonry barriers represent t latest fashion of reservoir-making in Englan and the gloss of novelty still remains. Th were practically unknown half a century ago, sa to a few hydraulic engineers, but are veneral structures in the East. Where rock dominat especially the older deposits; clay and earthwo are scarce; drainage areas large; and where is found necessary to make the whole leng of the dam into a waste weir; such sites a favourable for the use of concrete structur In very dry climates earthwork embankme built on a large scale are a source of dang owing to the evaporating power of the hot s and dry winds causing deep cracks to form in t outer slopes, which get filled with rain when comes and induce slips. In humid climat like our own there is no danger of this kin heavy dews forming on the grassy slopes prote them, and in the driest months of the m droughty year we have some rain. Earth embankments are more ancient than concre ones, and those built by the ancient Egyptia still endure.

Wise engineering consists in utilizing t available material found in the district in whi the proposed work is to be erected, wheth that material be solid rock or earthwork. earthen dam is cheaper than one made of co crete. It is sooner brought into use; and, as t president of the Institution of Civil Enginee said in his inaugural address last Novembe comparing the numbers of the two forms of da in use, fewer failures have taken place in t former than in the latter type of embankme Before an embankment of any kind can made much detailed work has to be done, a it is the attention paid to details that mak every work a success, more particularly, believe, in waterworks. You may have go designs and employ the best material, but carelessly put together the genius of the man diverted and good material shamefully waste So far my remarks have mainly referred the use of concrete; the remainder of paper I propose to devote to the details preparing concrete.

Stone-Breaking.

Stone broken by machinery is much bett than hand-broken stone, and costs considerab less. It is more uniform in size; and when t breaker is carefully attended to, it provides t necessary amount of sand requisite to form t concrete matrix. The best stone for hydraul concrete is the millstone grit, or rock of similar texture—the coarser the grit the bette but it should be free from dirt. If claye matter adheres to the stone it should be scrape off, and if necessary the beds should be washe Old fence walls and rejected bricks make goo concrete. It is not necessary to provide ver hard material to secure impervious concrete in reservoir trench; but the hardest stone shoul be provided for sewers, tunnels and sea-wal where there is surface friction to be resiste The hardest class of stone should also be used i arching, forming footpaths, barn, shippon an stable floors. Flint gravel makes the hardes and perhaps the most durable concrete, but it i expensive and difficult to obtain in the north England. Some engineers screen the stone a it falls from the breaker and wash the san before using it, but this seems costly an unnecessary when the rock in bulk can b obtained clean. The dust produced in breakin forms a very small percentage of the matrix, an in my opinion improves it when required fo impervious work. The finer interspaces ge filled, and in this respect the dust seems to ac beneficially.

For water-tight concrete the stone should b broken in cubes no larger than will pass throug a 2in. ring, and should contain plenty of sand For foundations in which the impervious character of the matrix is no object, larger stones may be used, but it is a question whether the

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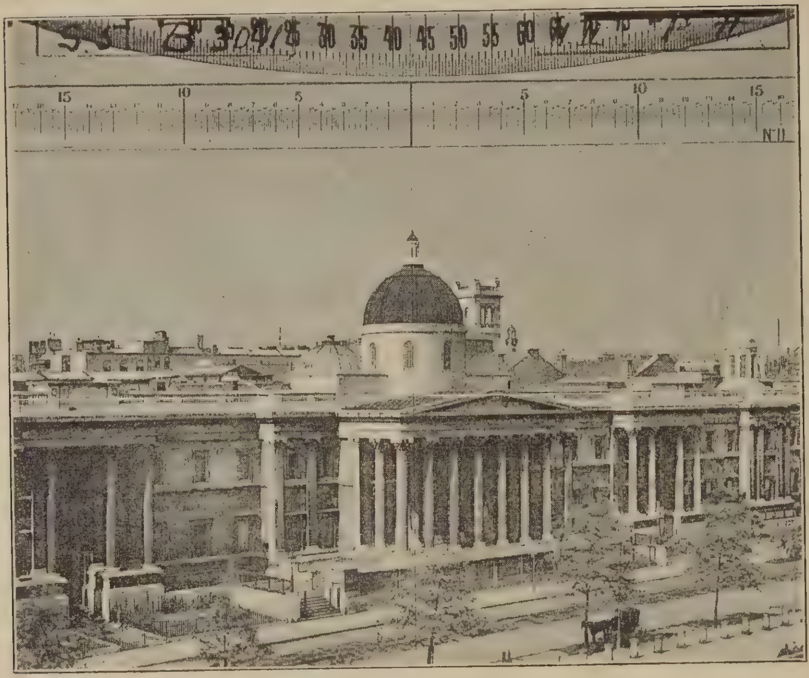
Wednesday, January 15th, 1902



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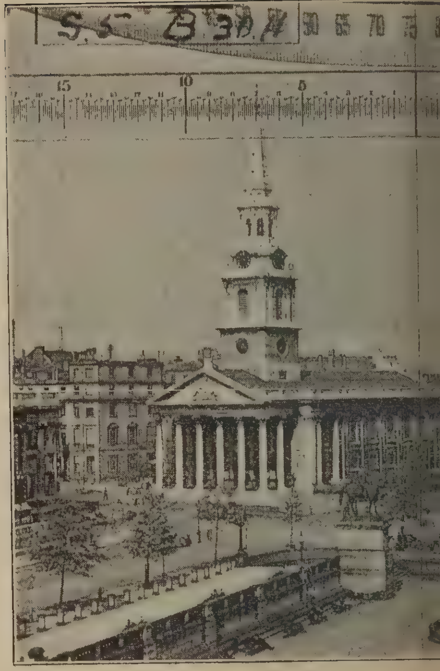

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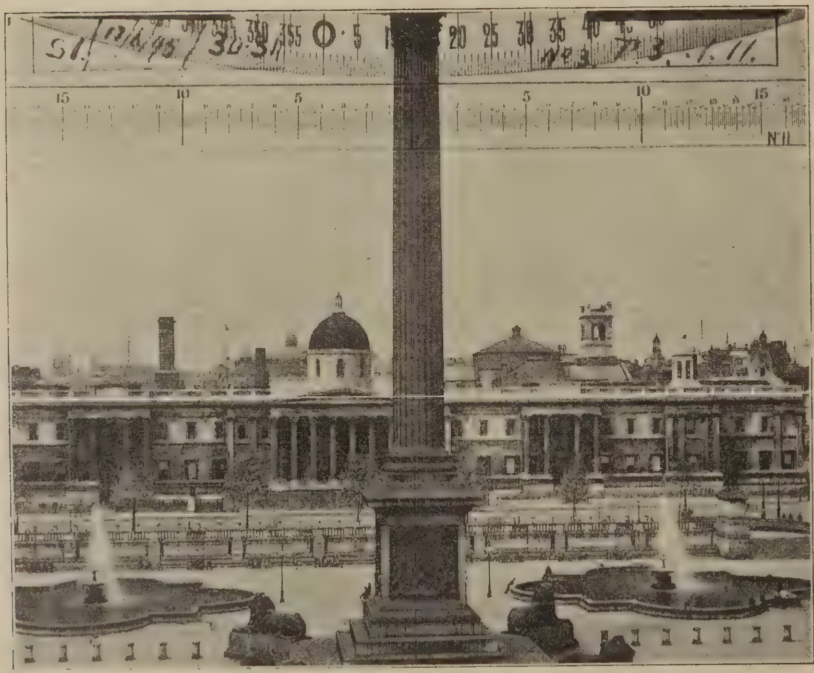

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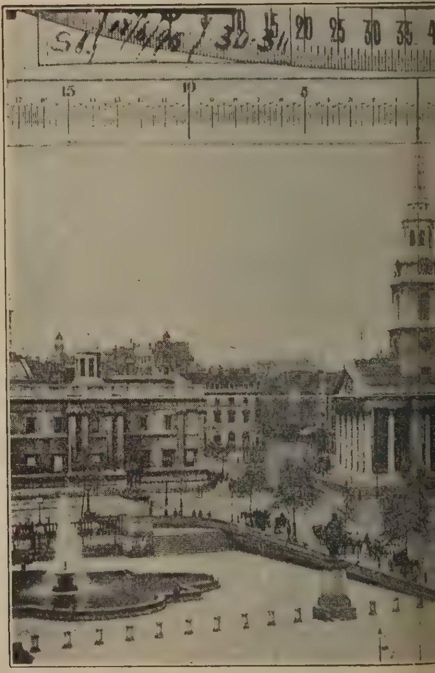
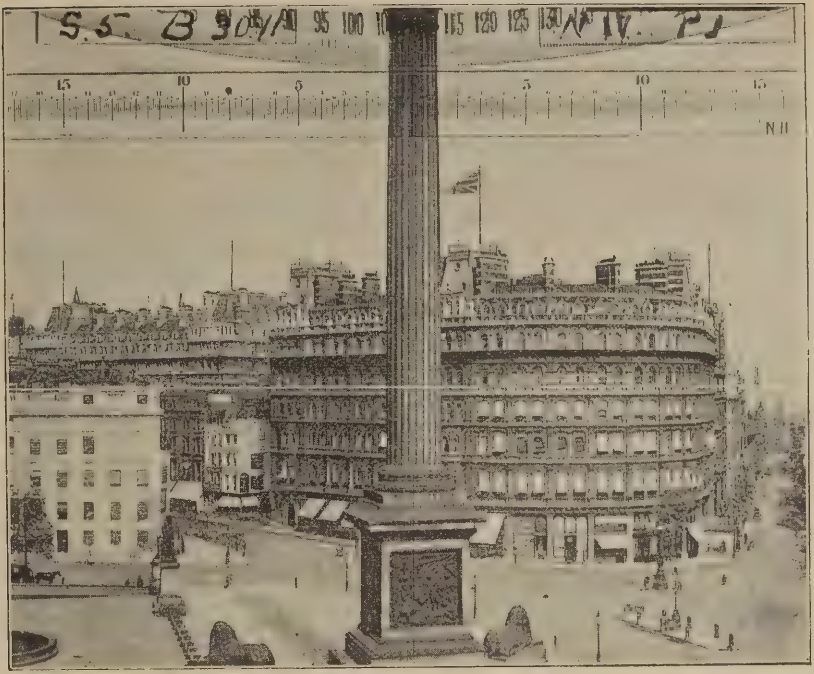


N. 2

SURVEY OF TRAFALGAR SQUARE, LONDON, MADE

The Upper Row of Views taken from a point on the top of the Union Club.

From this Series of Views it is possible to construct a Map of the greater part of Trafalgar Square which



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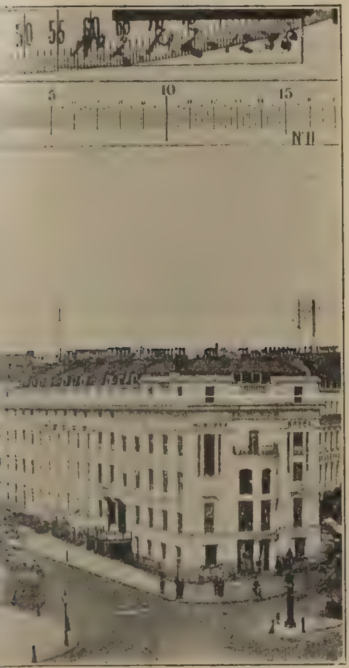

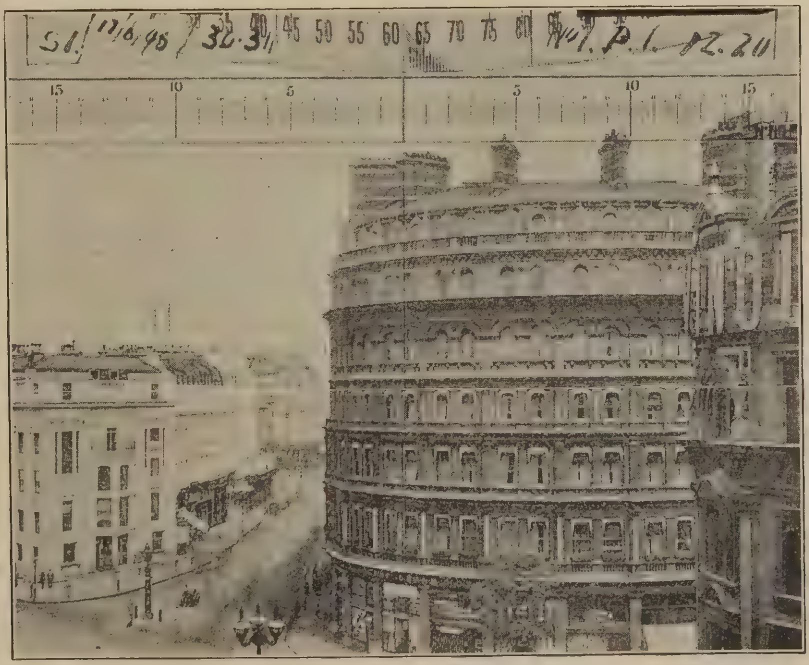

N. 1.

ITH THE BRIDGES-LEE PHOTO-THEODOLITE.

ower Row of Views taken from a point on the top of Drummond's Bank.

be found to correspond almost exactly at all points with the published Map of the Ordnance Survey.

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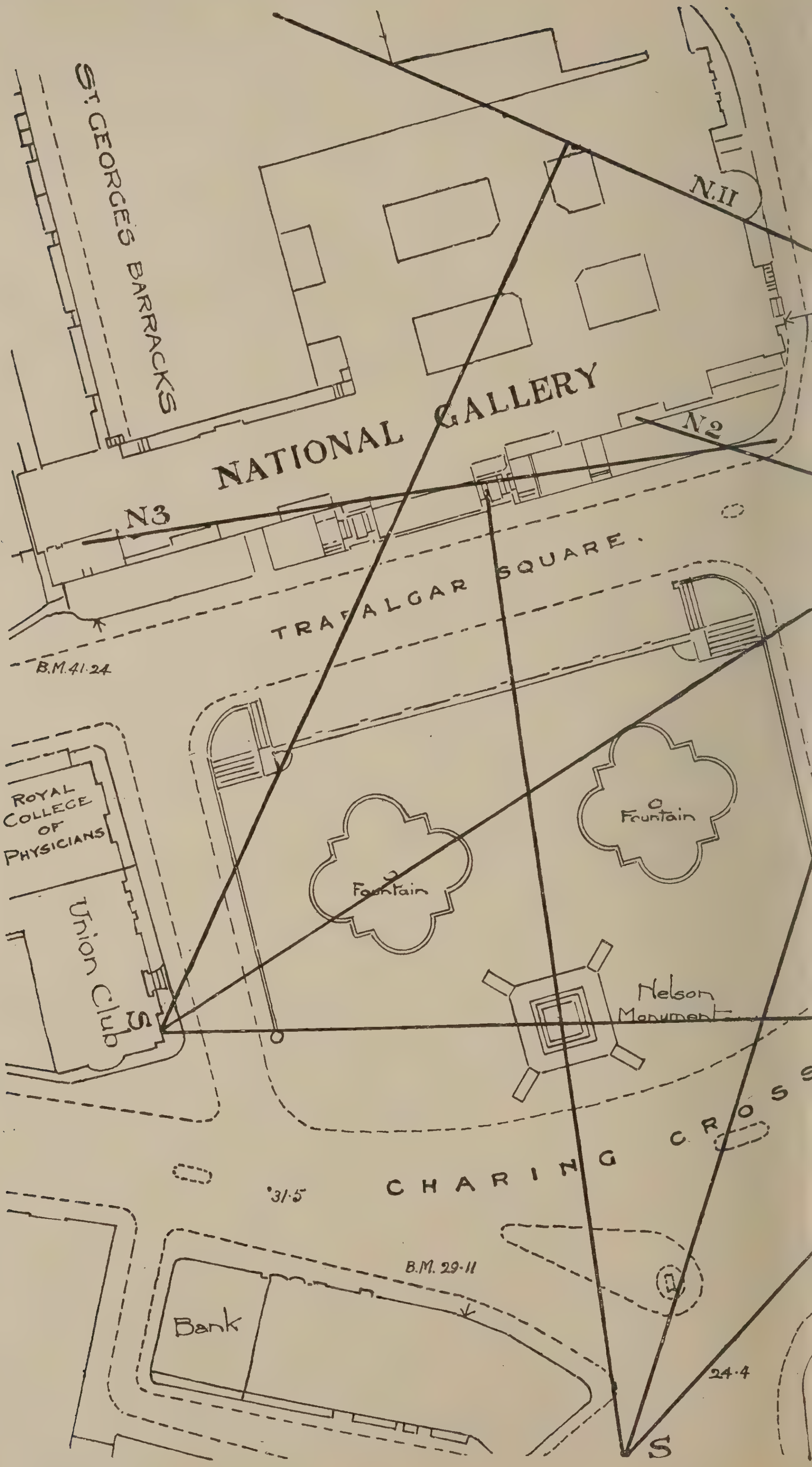
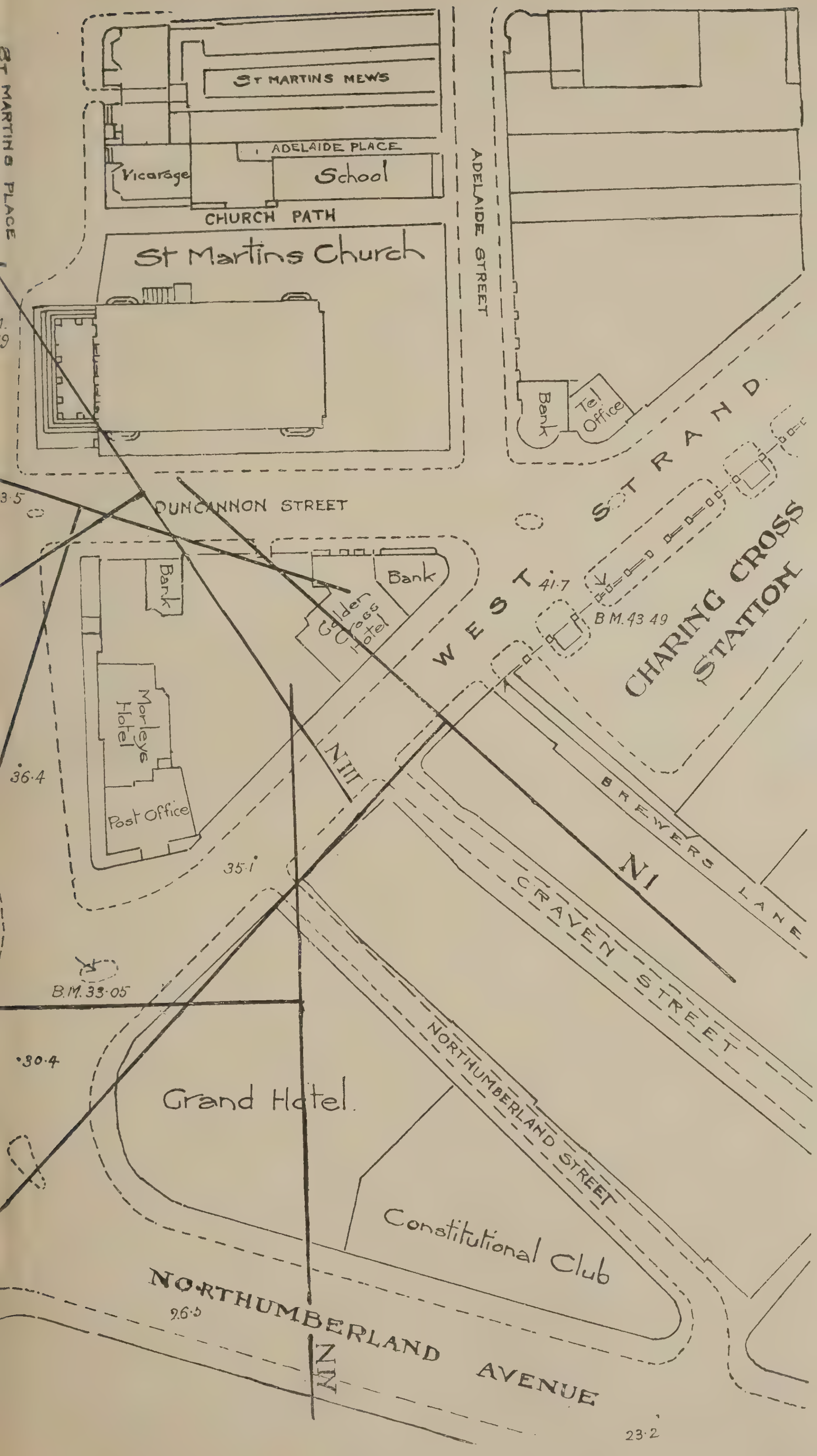


PLAN OF TRAFALGAR SQUARE, LONDON, SHOWING STATION-PO



TS OF VIEWS TAKEN BY THE BRIDGES-LEE PHOTO-THEODOLITE.

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smaller are not better, and it is wiser to err on the safe side. Where compressive strains only are to be encountered, clean dry stone may be employed in 3in. layers, pounded and grouted with a cement liquid. For bridge-pits, lofty chimneys and buildings better foundations cannot be formed. It must be understood, however, that I am speaking of foundations below the ground, where compressive strains only are brought into play. Where large masses of concrete are required, blocks of stone called "plums" are frequently embedded in it to reduce the cost.; these "plums" should be well cleaned and laid the best bed down in the matrix whilst it is in a soft state, and care should be taken that they are placed well apart so as to ensure that the soft material covers and overlaps them. "Plums" increase the density and stiffen the mass, and there is no objection to their use when the work is properly done. When the stone is broken by a stone-breaker it should fall into a waggon or skip and be taken to the mixing stage and manipulated at once.

The mixture then has its proper quantity of sand, which cannot be secured when run to spoil and subsequently refilled, owing to the stone separating from the sand, which is unavoidable in a large heap. In executing work of any kind the fewer and simpler the operations the better; thus labour also is saved, an important consideration in large public works.

Concrete Mixing.

It is necessary that all concrete should be carefully and properly mixed. Next to the use of good material, this is most important. The mixture should be thin, placed in position in this state, and never disturbed afterwards. Setting begins at once, and the crystallizing forces want free play, which they cannot have if the work be disturbed by men passing over it. The broken stone and cement should be measured in [illegible] provided for the purpose, and as much clean water used as the matrix requires to form the proper consistency—more rather than less. The mixings should not be too large: 20 cub. ft. of stone and sand and 4 cub. ft. of cement form a good mixing sufficiently large for a gang of six men to prepare and place in position before setting begins. The slow-setting cement gives more time and insures a better conglomerate, especially if the mixing stage be some distance from the place where the matrix is required. In watering the mixture a jet or rose should be used, as it moistens the material more evenly than when water is poured on it from a bucket. During the last turning the mixture is much improved by kneading with a light pick or shovel, the object being to thoroughly amalgamate the whole. The most trustworthy men should be employed for this class of work; they soon get accustomed to it and learn from experience to use their reasoning powers as well as their hands, and if properly paid they may generally be depended upon to do their duty. For more than twenty years I have been in the habit of letting the mixing of concrete to specially-selected gangs of men, and have never had cause to regret. The men also seem to prefer taking the work in this way. Inspectors are usually employed on large works to see that directions are carefully followed; but as a rule a good English navvy will be loyal to employers who are worth serving.

Concrete should always be mixed on stages provided for the purpose, which should be kept clean and well supplied with water. In levelling, the layers should not be too deep, and if the work has been at a standstill for a few days the surface of the old layer should be chipped rough, swept clean, and grouted before work is resumed. When the chipping is properly done the junction of the old and new layers cannot be detected after the whole has had time to set. In trench work vertical faces may be left for convenience, and when the junctions are carefully made they do not show and are perfectly water-tight. Concrete should not be tipped from the stage into the foundation, but placed in position as a homogeneous mass, whether required for foundations only or as a water-tight core. In deep trenches it is usually dropped down a wooden shoot, about 12in. square, to a platform, and afterwards shovelled into position. This is a very convenient way of letting it down, and the mixing is improved by the fall. The shoots, however, require frequent attention, or they get choked up by the fine material adhering to the sides, but this may be prevented by pouring a little water down after each delivery. In mixing, the material is reduced in bulk about 12 per cent., and this factor requires deducting in estimating the finished work. It is generally believed that Portland-cement concrete is far superior to hydraulic-lime concrete. For water-tight trenches I am bound to say that lime-concrete gives as good results, if properly manipulated, at about one-half the cost, and is easier to mix. Where, however, the matrix is placed in immediate contact with water in motion, or is required to resist compressive strain immediately, cement-concrete is superior; but in the course of a few months there is very little difference in the strength of the two mixtures. 4 to 1 lime-concrete gives as good results as 5 to 1 Portland-cement concrete for structures above ground, and it has also the advantage of being slower setting. I am aware this opinion is not generally held by the profession; but I am stating the results of many years' experience in the use of the two materials.

Let us see how these two concretes compare as regards costs.

Cement at 42s. per ton and 85lbs. per cub. ft. works out as follows:—

$$\frac{85 \times 42 \times 27}{2240} = 43\text{s. per cub. yd.}$$

Hydraulic lime at 21s. per ton and 63lbs. per cub. ft. gives the following result:—

$$\frac{63 \times 21 \times 27}{2240} = 16\text{s. per cub. yd.}$$

Cement-concrete at 5 to 1 requires 5 4 cub. ft. of cement per cub. yd. of matrix. Lias-lime concrete at 4 to 1 requires 6·75 cub. ft. of lime per cub. yd. of matrix. In round numbers, cement costs 1s. 7½d. per cub. ft. and lias lime 7d. There are 26·07 cub. ft. of cement and 35·00 cub. ft. of lime in a ton. A cub. ft. of Langsett grit rock weighs 154·5lbs. and has a specific gravity of 2·48. Concrete made from this rock weighs 138·30lbs. per cub. ft., and possesses a specific gravity of 2·22. Lias-lime concrete at 4 to 1 is certainly more fat than cement-concrete at 5 to 1. It contains 1·35 cub. ft. more cementitious material per cub. yd. to fill the interstices of the stone and sand, which is a decided advantage in its favour, although it is much longer in setting. In dry weather jelly-concrete requires 34 galls. of water per cub. yd. of concrete.

Builders' Notes.

The York Master-Builders' and Contractors' Association held its annual meeting last week. Councillor Mansfield and Mr. C. Prudames were re-elected president and vice-president respectively.

Mr. Stephen England, builder and contractor, of St. Annes, died recently in his sixty-eighth year. His firm executed much important work in the district. He was the first chairman of the St. Annes branch of the Master-Builders' Federation.

"Lockwood's Builder's and Contractor's Price Book."—The edition for 1902 of this valuable work has just been published. All the popular features are retained, and the prices have been revised and brought up to date. Its value as a reference book we have referred to before, and we need give no further commendation. It is published by Messrs. Crosby Lockwood & Son at 7, Stationers' Hall Court, Ludgate Hill, E.C., price 4s.

Messrs. G. B. Kent & Sons, Ltd., of 75, Farringdon Road, E.C., have issued their catalogue for 1902. The prices quoted are slightly easier than in 1900 and 1901. It is interesting to note that on January 1st, Mr. Sacheverell, who entered the service of the firm seventy-four years ago, called to wish the directors "A Happy New Year" on the commencement of the 125th year of the firm's existence. He was accompanied by Mr. Benwell, late foreman of painting-brush makers, who came to work for Kent's in 1846, and is now retired on a pension; so that the combined years of service of the two old employees amounted to 130 years, which must be a record hard to beat.

Engineering Notes.

Mr. James Ponsford, M.I.C.E., died at Cairo on January 2nd. He had been engaged for many years in leading positions, as an engineer, upon the construction and working of railways in European and Asiatic Turkey.

American Competition Beaten.—When the Central London Railway was constructed, all the rolling stock, rails, lifts—in fact, nearly all the engineering plant—was imported from America; and when the Company decided on some additional lifts they asked tenders not only from America, but also from some British firms, and it is quite refreshing to note that the British firm in this instance has been successful. Messrs. R. Waygood & Co., Ltd., of Falmouth Road, London, S.E., have been entrusted with this contract, being able to comply with the special requirements of the railway company. We also note with satisfaction that the lifts for the City and South London and the Great Northern and City Railways have been secured by a British firm in face of keen American competition.

South-West India Dock Improvements.—To meet the demand for more accommodation for large vessels in the Port of London, which is daily becoming more urgent, the directors of the London and India Docks Co. have for the last two years been carrying out extensive alterations and new works at the river entrance to the South-West India Dock. These works have just been completed, and the temporary dams are being removed, so that vessels 450ft. long and of a carrying capacity of 6,000 tons will be able to enter the dock by the new lock. This dock is, with the exception of Tilbury, the deepest in London, having a depth of 29ft. With its basin it has an area of 32 acres, and the quay walls are of sufficient length to accommodate twelve ships 450ft. long, in addition to a few shorter vessels. But as the old entrance lock was only 300ft. long, with a depth of 27ft. on the sill in the centre, reduced to 24ft. at the sides of the invert, it was decided to increase the length to 480ft. and lower the sill and invert to 29ft., and also to construct under the lock a sewer for the London County Council for the drainage of the Isle of Dogs, to replace an old sewer in the bed of the river in a somewhat dangerous position across the entrances to several docks. To exclude the water from the site of the works the contractors placed a timber caisson across the lock at the river end and drove a semicircular dam in the basin. This dam had a length of 360ft, and was formed of a single row of double timber piles 45ft. to 50ft. long by 26in. thick, driven 15ft. into the bottom of the basin, and supported at the top by a timber rib 16ft. wide, to preserve a true circular curve to the dam. The bottom of the basin, being composed of very fine silt and running sand, gave a great deal of trouble, and serious delay occurred in consequence of the water blowing up under the piles until the contractors weighted the bottom with a bank of sand in bags 15ft. high and tipped a bank of clay on the water side, after which the dam was perfectly watertight and stood very well. The extra pair of gates required for the extension were obtained from another part of the dock where they were no longer required. As the mud in these docks causes great inconvenience in working the gates, iron pipes connected with the sluice culverts have been imbedded in the concrete of the new gate platform, so that the act of lowering the water in the lock draws away the mud from the roller paths. The sluices are in duplicate, one set worked by hydraulic power, the other by hand in case of a breakdown. The sewer, which is 500ft. long, is carried under the lock by two cast-iron culverts, each 4ft. 6in. in diameter, bedded in concrete. These culverts enter penstock chambers 50ft. deep, built in brickwork through the centre of each quay wall, and can be closed by hydraulic sluices. The approach sewers on either side from the public road are 4ft. 9in. in diameter, and built of brickwork in tunnels which were driven through the sand. The cost of the works, including the sewer, has been about £52,000.

Messrs. Cobbetts, timber merchants, of 62–70, Virginia Road, Bethnal Green, E., have just issued their price-list for 1902.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Registering Houses.

LONDON, N.W.—D. B. writes: "Is there any advantage in having a leasehold house registered?"

There is no advantage whatever.

G. A. T. M.

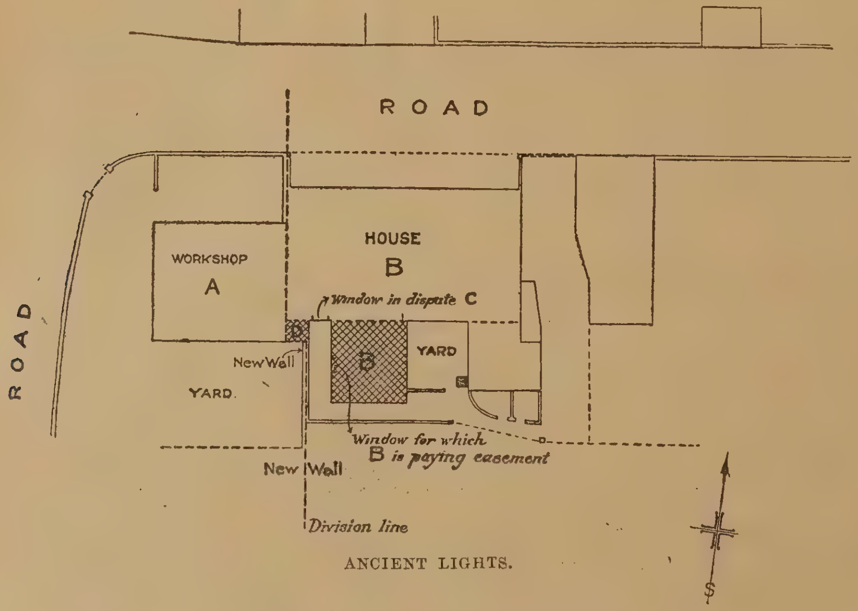
Whitening Rough-Cast.

TWICKENHAM.—BROWN MADDER writes: "Referring to my enquiry on p. 350 of your issue for January 1st, I fear from the nature of the reply to which you refer me you do not quite understand my difficulty. The rough-cast I have to treat exists and is at present a brown colour. This I wish to alter to white, and I propose doing so by giving the work two coats of lime-white. What can I mix with this to prevent the rain washing the white off?"

Lime-white is probably the best material you could use. To fix it, mix some alum with it.

Ancient Lights.

HARROGATE.—W. J. E. B. writes: "A is the owner of property to the west of the dotted line shown on the accompanying sketch, and B is the owner to the east. A proposes to erect a wall along the boundary of the two properties, the height of which will be above the window C in B's living-room. This light has been in existence for more than twenty years. About ten years ago B erected an off-shoot (cross-hatched on plan) and also a water tank over the existing scullery, marked D. They are both 6ft. higher than the top of the window C, and greatly intercept the light to it. B is enjoying light in the off-shoot by agreement with A. Can B legally prevent A erecting the wall on the ground that it interferes with his ancient light C?"



ANCIENT LIGHTS.

As frequently happens with queries of this nature, it is impossible to give an absolutely definite answer. At the same time, B evidently thought little of the value of his window at C when he erected the water tank and the off-shoot ten years ago, so that if he were to object to A building the contemplated wall now he would obtain but slight compensation, if any, as in comparison it would obstruct the light to a very small extent indeed. In all probability, if he were to test the case he would fail, under these circumstances, to obtain even an injunction against A. G. A. T. M.

Fonthill Abbey.

SOUTHPORT.—F. H. C. writes; "What is the present condition of Fonthill Abbey? Does any considerable portion of the house still remain, and is it possible to get to see it?"

Fonthill Abbey, a Renaissance building, has been very much overrated. Emerson considered it so bad that he adduced it as an instance of "the proneness of the English character to freaks." The Abbey consisted of a main block, the lower portion heavily rusticated, with an Ionic portico surmounted by a pediment, with armorial bearings in its tympanum, and of two wings of larger size, which caused the building to assume a crescent shape on plan. These wings have since been pulled down. An old archway ornamented on both sides with grotesques, a relic of one of the earlier abbeys on this site, stands at the entrance to the grounds. G. A. T. M.

Curing Smoky Grate.

WISBECH.—PUZZLED writes: "I am at a loss to discover the cause of the smoking of a 'Marlborough' grate (with adjustable canopy and Teale back) which has recently been fixed in a house. A common 9ft. iron tallboy has been fixed on the head for experiment, but with no good result. Why does the grate now smoke, whereas it used not to do so?"

Your chimney, it is evident, has not sufficient draught for a "Marlborough" grate, which utilizes so much heat that very little is available to heat the air in the chimney, as is necessary to get a good draught. The simplest remedy is to put in a quicker combustion grate, or you might try one of the many chimney cowls on the market to increase the draught.

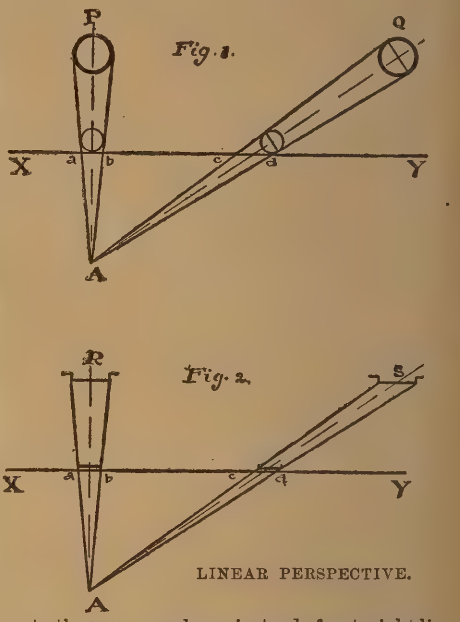
Cracks in Cemented Lake Bottom

LONDON, E.C.—NON-PLUSSED writes: "A lake is concreted with the best cement, and material of every description most carefully manipulated, and of an average thickness of not less than 6in., on solid ground. Notwithstanding this, though holding water perfectly during the spring, summer and early autumn, yet in October or during any great drop in temperature cracks open through which the water percolates and sinks away. It seems pretty evident that this is caused by contraction not only of the concrete but of the earth as it cools. For this a remedy is much desired—some substance that can be forced into the cracks when open, that will expand or contract according to the variations of temperature, so as to prevent the very troublesome leak."

We know of no substance that you can use that will expand with cold. We advise you to cut the concrete away along the lines of cracks to about 6in. on each side, and put down a layer of asphalt 1in. thick below the level of the concrete, leaving a ridge about 2in. wide along the centre, jutting up a little above the level of the top of the concrete. Then continue the cement up to the ridge, which will allow sufficient play for expansion and contraction. You will doubtless find some points of interest to you in the two articles in this issue on "Service Reservoirs" and "The Uses of Mortar and Concrete" respectively.

Linear Perspective.

HERSHAM.—R. R. writes: "Will Mr. Middleton please say why the far column Q (Fig. 8) in his book on linear perspective is not projected on to the X Y as a column instead of a straight line c d; and also if Fig. 1, columns, and Fig. 2, pilasters, are or are not correctly projected?"



LINEAR PERSPECTIVE.

Querist's Fig. 1 is practically the same as Fig. 8 in the book referred to, and his first query is therefore to be answered by pointing out that the spaces between the extreme rays from the columns to the eye at A are intercepted at the X Y by the portions of the X Y lettered *a b* and *c d* respectively. Both diagrams are correct, and it will be noticed that *c d* increases in the case of columns and diminishes in the case of pilasters, as they are further from the eye, columns being thus incorrectly rendered in parallel perspective.

G. A. T. M.

Damp Walls.

MANCHESTER.—F. B. B. writes: "Two houses in different parts of the north-west of England have sides exposed to the full force of the prevailing (south-west) wind and rain, which cause damp to get through the walls. One house is of brick and has at some time been coated with coal-tar or similar material, but this has partly worn off and is now useless. The other house is built of a gritstone, evidently porous. What would be the cheapest way to remedy the defect?"

The cheapest method is undoubtedly to renew the tarring, which would be more effective if a considerable quantity of pitch or bitumen were added and the mixture applied hot. But this, of course, requires constant renewal, and in the long run it would be more satisfactory and cheaper to use vertical slating or tiling.

Earth-Closets for Country House.

HOVE.—R. R. writes: "Please name a good work on algebra of use to an architect's assistant. What I want is a brief, compact and sensible exposition of the science, with answers especially adapted for building purposes. Also, please give plan, section, details and explanation of what you consider to be the best privy for a country house where there is no water service."

There is no book on algebra as applied to building. If you are familiar with the science as you should be, you will find no difficulty in applying the rules. With regard to your second question, an earth-closet should be used, and if you obtain catalogues from Messrs. Moule's Patent Earth-Closet Co., 5A, Garrick Street, Covent Garden, W.C.; Morrell's Sanitary Co., of Manchester; or Mr. W. F. Parker, of Oxford; you will find all necessary particulars. A privy is insanitary, and we therefore prefer not to give a design. See the article on "The Sanitation of a Country House," which appeared in our issue for November 20th last.

SERVICE RESERVOIRS.*

THEIR DESIGN, CONSTRUCTION AND COST.

BY WILLIAM INGHAM, A.M.I.C.E., M.I.M.E.,
WATER ENGINEER, TORQUAY.

FOR some years past I have been collecting material for a paper on this subject, and have now no hesitation in laying before the Association the conclusions I have arrived at.

In connection with any waterworks scheme, one of the first things which has to be considered is the position, size and materials to be used in the construction of the service reservoir. That a service reservoir is a necessity in most waterworks schemes will, I think, be agreed to by all, so that it behoves the engineer to select a site that will, if possible, give the necessary altitude, a good foundation, and the required area of ground.

The Chief Points

to be considered in connection with the design of service reservoirs are: (1) The greatest daily variation in the supply; (2) the length of time necessary to repair any defect either in the trunk main, pumping engine, or other machinery between the storage reservoir or well and the service reservoir; (3) the maximum requirements in case of fire, or of the bursting of water-pipes (as in 1895) due to frost; and (4) utilising the reservoir to equalise the variation due to intermittent pumping.

The variation in the daily consumption is by no means the same in different towns, or even in different districts of the same town.

Where there is only a single main from the storage to the service reservoir, the latter should be large enough to supply the district for three or four days—if in duplicate, from one to two days' supply will be found sufficient; but the capacity of the reservoir must depend somewhat on the length and accessibility of the main. If the distance from the storage to the service reservoir be short, it may be more economical to lay a second main rather than to build a larger service reservoir.

For pumping schemes where the machinery is duplicated, a two days' supply is generally sufficient. If the supply is delivered to the town direct from the trunk mains, a larger pipe will be required, as it will have to discharge at a rate sufficient to meet the greatest demand, but with a service reservoir this will be avoided. If the district supplied is very hilly, it can be worked in zones by separate reservoirs, the sites being fixed to give a head of not less than 60ft. or more than about 150ft. above the pavement level.

If the reservoir only supplies water to property around the hill upon which it is built, the pressure can be reduced by a reducing valve; but where the pipes run across a valley to supply property on another hill, it is not advisable to lower the pressure. The depth of service reservoirs is generally between 9ft. and 18ft, the most economical depth, considering all things, probably being within the limits of 12ft. and 14ft. Low walls are much cheaper per ft. in height than high ones, and this should be carefully considered when designing a reservoir.

For covered reservoirs the economical depth to be excavated under the original surface of the ground may be taken at from 50 to 60 per cent., and for open ones at from about 45 to 50 per cent. of the height of the wall. If the soil can be excavated by machinery, it will pay to do it if the quantity exceeds 30,000 cub. yds.; the cost then being from 9d. to 1s. per yd. The filling behind the walls should be of selected earth, brought up in 9in. layers, slightly watered, and well rammed. The embankment should be consolidated in the same way, and finished with a slope of from 2 to 1 to 3 to 1, according to the character of the material, but should in no case exceed its natural slope. Embankments settle about 1in. per ft. of depth, and enough soil should be left on the ground to bring them up to their full height after settlement. On completion, the embankment should be turfed or sown with grass seeds, but on no account should trees be planted immediately behind or near the reservoir walls.

The inlet pipe may be below, but is better above, the water-level in the reservoir. The outlet supply pipe can be controlled by a valve, either within the reservoir or behind the walls. The best practice is to place the valves in a well behind the walls, so that they can be examined and repaired without interfering with the supply. All pipes under water should have flanges cast on them to prevent creeping, and be laid in fine concrete and grout. The weakest place in a reservoir is, as a rule, along the line of outlet pipes, and unless they are carefully laid in cement grout leakage will occur.

Under certain conditions, the inlet or delivery main to and the supply pipes from the reservoir may be connected with a by-pass outside the reservoir, so that when the reservoir is being repaired or cleaned out the supply to the district can be maintained. This, however, is not advisable where the pressure in the delivery mains is high, as the fittings in most towns might be unable to stand it. On the other hand, any excessive pressure could be lowered to meet the exigencies of each individual case by means of a reducing valve. Otherwise, a dwarf wall could be built in the reservoir, separating it into two compartments having an outlet pipe from each, so that either compartment could be cleaned out without varying the pressure on the fittings to any great extent.

Before designing the reservoir, it is absolutely necessary that the engineer should make himself acquainted with the class of material he is going to build upon by making trial pits; for unless this is done failure may occur on the one hand, or, on the other hand, a costly reservoir may be constructed where a much cheaper form would be quite as efficient.

The materials chiefly used in constructing service reservoirs are concrete, brick, puddle, asphalt and bituminous sheeting. Asphalt, as a waterproof material, in the form of mortar and concrete, was used about 4,000 years ago at Babylon and Nineveh; while at Memphis, in Egypt, it was also used for keeping basements dry. Sometimes the above materials are used in conjunction with one another, but I consider that puddle is used in many cases when there is absolutely no necessity for it. For instance, to place 2ft. of puddle behind a reservoir wall with a mean thickness of 4ft., and to then make the floor with concrete 15in. thick without puddle, is bad engineering, especially where the land is subject to settlement. Where, as in some of the Colonies, it is practically impossible to obtain good workmanship, one can understand puddle being used; but to use it in any and every place is an exhibition of bad designing. Of late years concrete has been largely used for waterworks purposes, and, if properly made, it is a very desirable material. The thickness required in a reservoir floor will, to some extent, depend upon the depth of water, the geological nature of the ground, and the class of concrete used. A rough-and-ready rule for a fairly good floor of concrete alone is to make the thickness of concrete equal to one-twelfth of the depth of water, with a minimum thickness of 6in., the concrete being 6 to 1 and rendered with cement and sand in equal parts. This thickness can be reduced if either asphalt, puddle or bitumen sheeting is used in conjunction with the concrete, as shown in the examples A, B, C, D, E, F (Fig. 1).

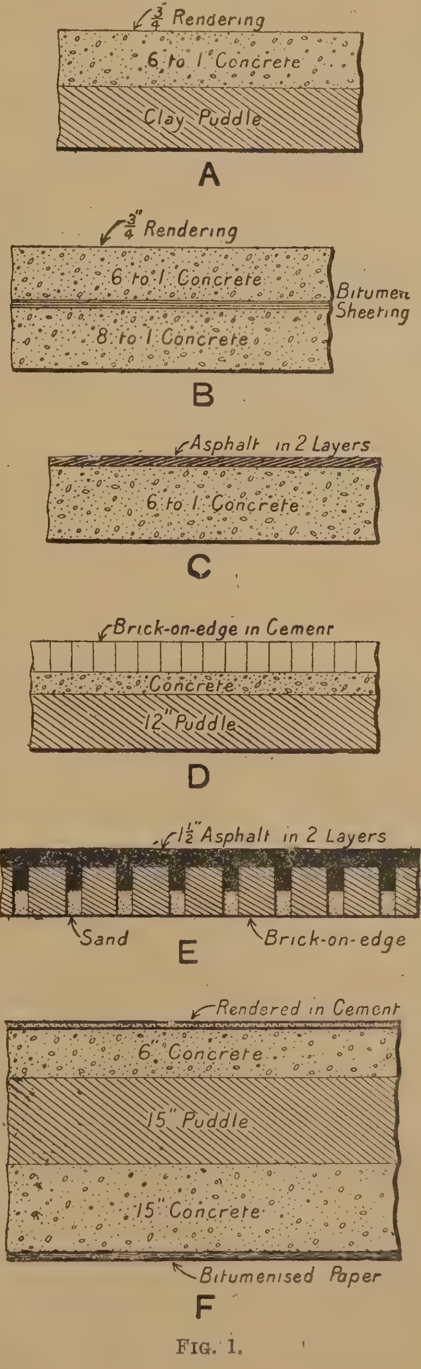


FIG. 1.

In the case of D, the brick on the surface of the concrete appears to be superfluous; and E shows a design which cannot be recommended except for cheapness. In the latter case, after the slope and bottom have been made to a proper batter, a layer of sand 1in. in thickness is placed upon it; then bricks on edge, spaced about ⅜in. apart, with the joints filled up to about one-half the depth with sand; after which asphalt is poured into the joints and allowed to run over the face, upon which, again, another layer of asphalt about 1½in. thick is laid, and is finally painted over with pure asphaltum.

Asphalt, asphalt-concrete and concrete slabs are now being used for covering the floors of reservoirs, the joints being filled up with asphalt or cement motar respectively. To avoid cracks in concrete due to expansion and contraction, it would be an improvement if the joints were run with asphalt. York stone, brick and cobble stones are also used; but the first is expensive, and the two last are dirty. If strength is required with a minimum thickness, concrete slabs with expanded metal embedded in them, as at Cardiff and at Warrington, can be used. All rendering should be done before the concrete sets, or, if that is impossible, the surface should be roughed and washed before the coating is put on. The concrete commonly used in reservoir construction varies from 5 to 1 to 7 to 1, and should be made of clean materials, with a large percentage of small stuff and sand; and if crushed by machine the fine dust should always be retained. How to lay concrete is a subject which is frequently discussed. Personally I favour a rather (but not too) wet concrete, so as to obtain a mass which, when slightly rammed, moves like an ordinary table jelly and brings the liquid cement to the surface.

Puddle varies considerably in different localities; and where for a certain head 1ft. would be sufficient in one case, in another 2ft. would be required. The best puddle for waterworks construction is the bluish-grey clay common in the carboniferous formation of the mining districts. The worst kind I know is the Devonshire potters' clay, known as kaolin, it being the disintegrated felspar of granite rock; some of the yellow clays, however, are very good. To test clay for waterworks purposes, a piece of about 1in. diameter should be rolled to about 1ft. long; and if it will support itself without breaking when held by one end, it may be classed as good. The weight which can be put on good clay varies from 1½ to 4 tons per sq. ft. An admixture of cinders with puddle will stop rats from making passages through it. Puddle and concrete can be used together with advantage when the reservoir is constructed on a permeable formation or jointed rock; but when there is a probability of unequal settlement, it is advisable to use puddle with asphalt or bituminous sheeting laid on the top of bricks driven into the puddle, as this gives a considerable amount of elasticity

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* A paper read before the annual general meeting of the British Association of Waterworks Engineers at Birkenhead, July, 1901.

The thickness of puddle generally varies between 9in. and 24in., according to the class of material and the head of water to be resisted; but when it is used for reservoir floors it ought to be well selected and placed *in situ* in thin layers, well worked by cutting, cross-cutting and ramming; dirty joints must be avoided, and if a little gravel is added to the puddle it will increase its weight-carrying capacity and prevent it shrinking or cracking so quickly. When there is a good natural bed of clay in the bottom of a reservoir, as in some of those in the Thames Valley, a thin layer of cement-concrete, or concrete slabs, will be sufficient to protect it and facilitate cleaning out. Good clay beds or solid rock make the best foundations, but the rock should be stepped if there is a considerable dip in the strata, and in clay beds the puddle core of the embankment should be sunk 2ft. to 4ft. into the natural clay.

Gravel and coarse sand make good foundations if kept from spreading, whereas silt and fine sand give much trouble, and, as a rule, require piling. If the bottom of the reservoir is founded on book-leaf clay, care must be taken to see that it is stable and not inclined to slide on its beds; this clay is very treacherous, and great care is required to make a successful job of the work founded upon it.

Reservoirs should never be constructed on made ground unless it has been thoroughly consolidated, and even then it may be advisable to increase the footings, or carry piers down to the orginal ground level, so as to act as bearing pillars.

Where the bottom of a reservoir is waterlogged, or of very absorbent material, and there is any difficulty in getting the concrete to set, the construction applied at the Charlottenberg reservoir of the Berlin waterworks can be adopted, bitumenised paper being spread over the bottom previous to the first layer of concrete being put in, as shown at F (Fig. 1).

There is a greater difficulty in dealing with the floors of covered reservoirs than with open ones, because the weight of the piers, walls and floor gives rise to unequal pressures on the foundations.

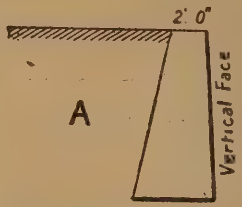
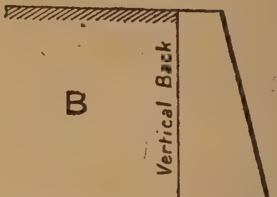
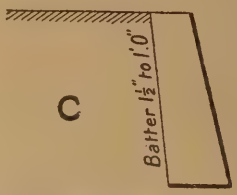
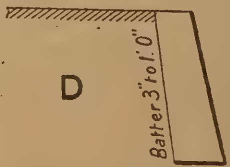
Where springs are met with the water should be led away from the site; or if, owing to the contour of the surrounding land, that is impossible, a valve may be placed in the bottom to allow the water, if pure, to enter the reservoir. Air gives trouble in some cases, as at the Devonport works, where Mr. Francis had much difficulty in completing the Belliver reservoir, but it can be dealt with in a similar manner to water.

An example of building a covered reservoir, holding 660,000 gallons, in bad ground at Bordeaux may be referred to here. The site was one which with the ordinary methods of construction would have required piling all over, the foundation being peat and black mud. This would have been very costly, so it was decided to erect an iron reservoir having sides 0·15in. thick and the bottom 0·20in. thick, supported on a grillage of 8in. girders, the only piles put in being immediately under the columns supporting the roof. Eighty tons of cast-iron and 320 tons of wrought iron were used in the construction, the cost being £7,800, or £11 16s. 4d. per 1,000 gallons.

Practice varies considerably in the designing of service reservoir walls, some being economical in design, while others are far from it. At the same time we must not be led to conclude that the heaviest wall necessarily shows an example of bad design, for there are cases where local conditions make it absolutely necessary to design heavy walls, and one design for all cases cannot be adhered to. Considering the large number of retaining walls that have been erected in connection with railways, gasworks and waterworks in this country, our knowledge of the lateral pressure to which such walls are subjected is very small indeed. The researches of and theories advanced by Coloumb, Barlow, Poncelot, Rankine, Levy, Boussinesq, together with the practical studies of Lieutenant Hope, General Pasley, General Cunningham, General Burgoyne, Colonel Michon and Sir Benjamin Baker, have done much to give us a wider knowledge of the subject; but a larger number of practical tests will have to be made before we can design walls on a thoroughly sound and economical basis.

The following experiments made by General Burgoyne are instructive, although they would have been of considerably more value if some kind of mortar had been used in the building of the walls. The material was distributed as shown in the four examples (Figs. 2, 3, 4 and 5), the walls all being 20ft. long and 20ft. in height and the mean thickness one-sixth of the height. In Fig. 2 the thickness was 5ft. 4in. at the base and 1ft. 4in. at the top, with a front batter of 1 in 5. In Fig. 4 the thickness was the same, but the batter was on the back instead of the front. In Figs. 3 and 5 the thickness was 3ft. 4in. throughout. The walls consisted of rough granite blocks laid dry, with a backing of loose earth, filled in at random during a very wet winter. The wall in Fig. 2 stood intact, but that in Fig. 3 tilted forward about 2in. at the top. Those shown in Figs. 4 and 5 both fell when the filling reached a height of 17ft. That in Fig. 4 broke at a height of 5ft. 6in. above the base, and after it had been pushed over some distance at the top. That shown in Fig. 5 was gradually pushed forward about 18in. bodily, and then broke off at about a quarter the height, in a manner similar to which the Barry Dock wall failed last summer. These walls, without mortar, stood about 50 per cent. more pressure than indicated by theory, and it is instructive to notice their relative stability, as each contained the same amount of material. The effect of varying the section of walls is clearly shown in the following examples,* where each wall has the same stability, under conditions which were common to each: Height of walls, 18ft.; top thickness, 2ft.; weight of each, 100lb. per cub. ft.; weight of masonry, 150lb. per cub. ft.; natural slope of earth, 34 degs.; and factor of safety, 3.

In each case the earth pressure is taken to be normal to the back of the wall; but should it be taken as inclined, the quantity of masonry will be less in each case. From these sections it will be seen that as the backward inclination of the rear face of wall increases, the quantity of material required for the same stability decreases, and the influence of front batter can be seen by comparing types A and B. If the walls were surcharged, a little extra thickness would be required.

Type.	Thickness of Base.	Cubic Yards per Lineal Foot of Wall.	Percentage of Material. Rectangular Wall = 100.
	9·4	3·80	73
	7·1	3·03	58
	5·4	2·47	47½
	3·4	1·8	35

Walls built of heavy material need not be quite as thick as those of lighter weight. The length of a wall also has a considerable influence on its strength, and it is advisable to construct long walls with a heavier section than short ones. Counterforts, no doubt, effect a slight saving in material, but the total cost of construction is about the same.

In deep reservoirs, or where the bottom is compressible, it is best to build the wall first, and thus obtain the advantage of shoring up the earth at the rear of the wall during construction. Unequal settlement, and consequent breaking of the concrete used for the floor of a reservoir, is also thereby avoided.

Brunel's and Stevenson's types of retaining walls are shown in Figs. 6 and 7, either of which will answer for reservoir purposes, although the latter is the better. There is always a risk of a wall which does not stand on a horizontal base being pushed back a little into the earth, thereby causing a tensile strain at the junction of floor and wall, and ultimately fracture and leakage. The thickness in Brunel's type is one-sixth of the height, with a curved face of 150ft. radius, batter of 1 in 5, and counterforts 2ft. 6in. wide at every 10ft. The thickness in Stevenson's type (for masonry) is one-third of the height at the base and one-fourth of the height half-way up the wall, with a curved face batter of 1 in 6.

Two examples of walls designed by me are shown in Figs. 8 and 9. The latter has a thickness of base one-third of the height, and would do very well in good earth; while in the former the thickness is four-elevenths of the height, and gives a rather heavier section, which might be adopted where the earth backing is not so good as in the first case.

The thickness and stability of the walls may

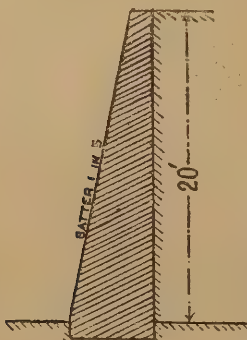


FIG. 2.

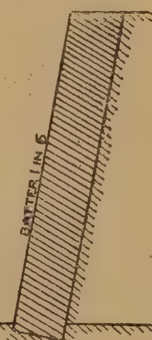


FIG. 3.

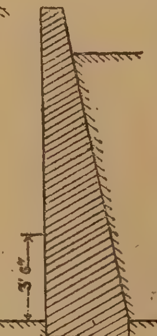


FIG. 4.

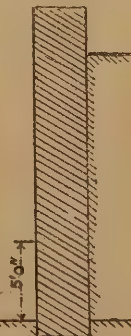


FIG. 5.

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* Merriman on "Retaining Walls."

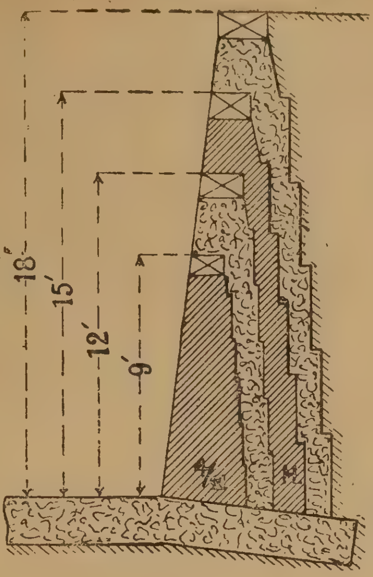

FIG. 8.

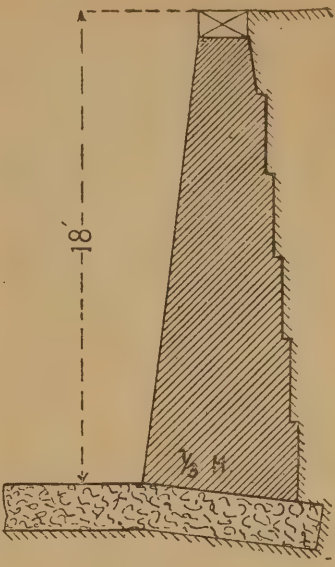

FIG. 9.

be calculated by means of Rankine's and other well-known formulæ, or by the graphic method given in Rivington's "Notes on Building Construction," Part IV. It has been pointed out by Sir Benjamin Baker that the usual formulæ for the lateral pressure of earth backing give a factor of safety of about 2.

As there is much to be learned from failures, a description of the case of the Hartley reservoir, Plymouth, will be instructive. This reservoir, when first built, had a wall of thin masonry backed with puddle; but as some time after it had been finished the walls were found to be gradually bulging forward, it was decided to place another thin wall and a layer of puddle in front of the original one. This, too, gave way in course of time, and it was finally decided to build a substantial and well-designed wall in front of the original one, after removing that shown by dotted lines in Fig. 10. The reservoir contains about 7,200,000 gals., and is now water-tight. The failure appears to have been due to the thinness of the wall, helped, perhaps, by the shrinking of the puddle during a dry season, and consequent swelling after heavy rains.

The covering of reservoirs is a matter upon which there is much difference of opinion amongst engineers and the medical profession. Whether there is any necessity for covering reservoirs depends upon the character of the water and the purity of the atmosphere in the neighbourhood of the reservoir. Generally speaking, it will be found necessary to cover all reservoirs wherein hard waters are stored, but in some instances only where soft waters are stored. In the neighbourhood of large manufacturing districts it may be necessary to cover them whether the water be hard or soft. It appears to be common-sense that if water is polluted by the atmosphere, or the action of sunlight causes vegetable matter to grow in abundance, the reservoir should be covered.

Dr. Procucci, speaking of the bacterial effect of sunlight, states that there is a marked decrease of bacteria in sunlight and an increase in the dark. Dr. Samuel Rideal also, in his book on "Water, and its Purification," says: "The improvement of water in reservoirs is largely due to the deposition of suspended mineral matter and bacteria; but, in addition, open storage reservoirs favour the beneficial action of aëration and light."

In deciding the kind of roof to adopt, consideration must be given to the durability and weight of the material it is intended to use. The life of ironwork has been placed by Sir R. Rawlinson at fifty years. If, however, the roof be properly designed, there is no reason why its durability should be less than any other kind of structure, provided that the ironwork be embedded in concrete.

Groined brick arches make a good and durable covering, but concrete is much cheaper to construct, and is lighter per sq. ft. of covering, owing to the reduction in the quantity of material required. A light and strong concrete roof can be obtained with a span of 12ft., rise of 2ft. 6in., and thickness at crown of 6in.; or if granolithic concrete be used, the weight can be somewhat reduced. Groined elliptical arches require a small amount of material, and give clear headroom in each direction, which facilitates ventilation. Semicircular arches are expensive, owing to the loss of space, as the water-level should never be higher than about 3in. below the line of springing. There are, however, exceptions, as in the case of the Bath reservoir.

Amongst the many ways of covering reservoirs the following may be mentioned, though Nos. 1 and 5 cannot be recommended:—

(1) Wood roof with slates;
(2) Concrete arches;
(3) Girders and jack arches;
(4) Girders and concrete slabs;
(5) Corrugated iron;
(6) Concrete enclosing girders and joists;
(7) Expanded metal and concrete.

The roof should be well ventilated, and have inspection manholes fixed in suitable positions, so that direct light may never be admitted except when cleaning out the reservoir. For this purpose a manhole-cover 15in. by 15in. to every 300 sq. ft. of roof is sufficient. If the roof is carried from the side walls, which in covered reservoirs are usually built with vertical faces so as to reduce the roof area, they must be designed accordingly bearing in mind the fact that any outward pressure resists the overturning effect of the earth backing. In America it is a common practice to take the outward pressure of the roof upon a metallic ring fixed near and around the top of the wall. If the roof rises above the surrounding ground level, the effect of the wind-pressure transferred to the walls must also be borne in mind. Occasionally, to avoid the turning movement on the wall, the roof is supported from a point some distance behind the side walls. This method can be adopted when it is found necessary to cover an existing open reservoir. When the roof is entirely underground, it is usual to cover it with 12in. to 24in. of earth.

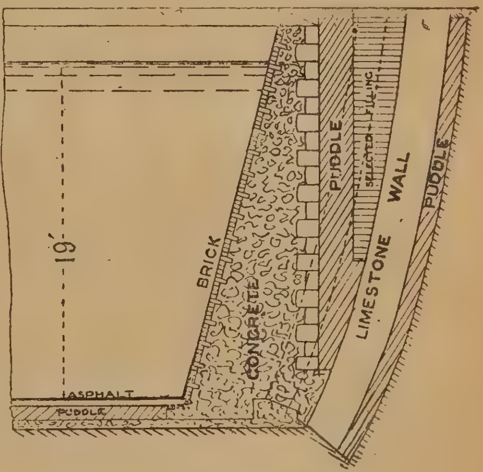

FIG. 10.

To prevent rainwater entering the reservoir, it is necessary to cover the roof with some impervious material, such as concrete, puddle, asphalt or bitumen sheeting, the last being the cheapest and lightest. All spandrels should be drained away from the reservoir.

The whole weight of the roof is seldom carried by the walls, excepting in small reservoirs, some portion being, as a rule, carried on concrete or brick piers, or on steel or iron columns. The piers must be designed according to the weight they have to carry and their length. It is cheaper, owing to their small section, to build piers of brick than of concrete, and from one-fifth to one-sixth of the height is the usual width for the side of a square pier. To distribute the pressure over a greater area of footings with the same quantity of material in the piers, a cruciform section is sometimes adopted. Pier footings should never penetrate through the full thickness of the floor, or they will form lines of weakness and leakage; and where there is trouble from upward pressure inverted arches should be built at the bottom of the reservoir, and the pressure transmitted through the piers or columns to the roof, which can be weighted accordingly.

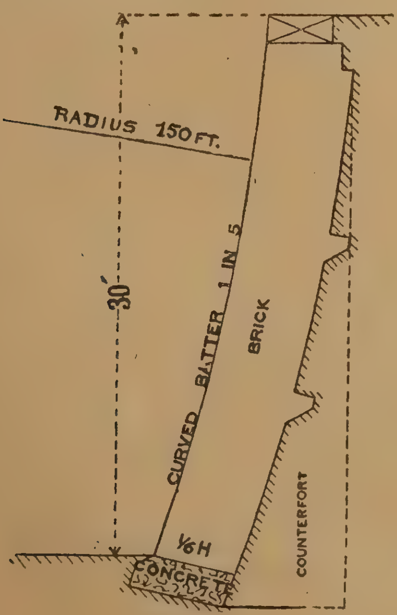

FIG. 6.

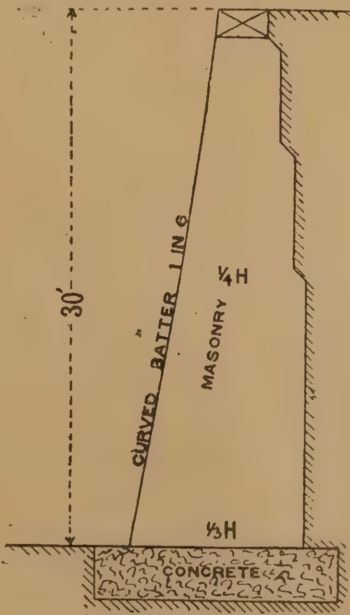

FIG. 7.

The cost of executing the work in different portions of service reservoirs may be apportioned as follows :—

For Open Reservoirs.	For Covered Reservoirs.
Excavation, 15 per cent. of total cost.	Excavation, 10 per cent. of total cost.
Floors, 35 per cent. of total cost.	Floors, 24 per cent. of total cost.
Walls, 50 per cent. of total cost.	Walls, 28 per cent. of total cost,
	Roof, 38 per cent. of total cost.

Small reservoirs are more expensive to construct per 1,000 gals. of capacity than large ones. With regard to the question of rectangular as compared with circular reservoirs, I think that engineers are not fully alive to the advantages to be gained by making reservoirs circular in plan. As to wall length, in a reservoir having an area of 10,000 sq. ft., if square, 100ft. by 100ft., the wall length will be 400ft.; if rectangular, 80ft. by 125ft., 410ft.; and if circular, and approximately 113ft. in diameter, 355ft. There is thus an average difference of 50ft. between the length of the circular walls and the straight ones, and the narrower the rectangular reservoir is the greater will be the difference.

The cost of a properly-designed open reservoir to hold 12ft. depth of water may be anything between £3 and £5 per ft. run of wall, and taking a mean cost of £4 with the above lengths the relative costs will be, if square, £1,600; if rectangular, £1,640; and if circular, £1,420: representing a saving of about 12½ per cent, or 5s. 4d. per 1,000 gallons, on a comparatively small reservoir of 750,000 gallons capacity.

Besides this, in circular reservoirs the walls need not be designed as thick as in rectangular ones, and there will consequently be a large saving in cost. The thickness of straight walls for rectangular service reservoirs varies between a quarter and two-fifths of the depth, while those of circular reservoirs or gasholder tanks have been found strong enough where the thickness has been between the limits of one-sixth and one-tenth of the depth.

After careful consideration it must be concluded that circular reservoirs are from 20 to 40 per cent. cheaper than rectangular ones, although it must be borne in mind that the former are not so economical in ground space as the latter.

Perhaps the finest example in the world of a service reservoir is that at Buenos Ayres,* which has a capacity of

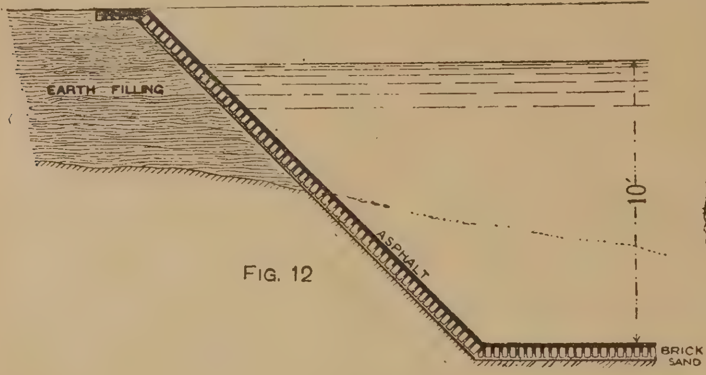

FIG. 12

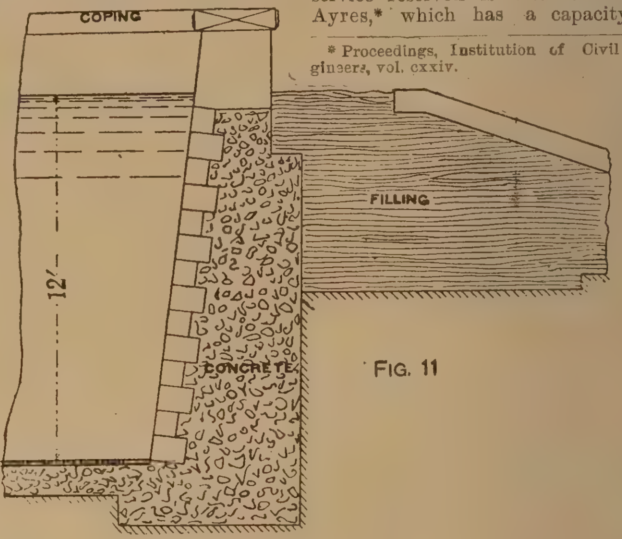

FIG. 11

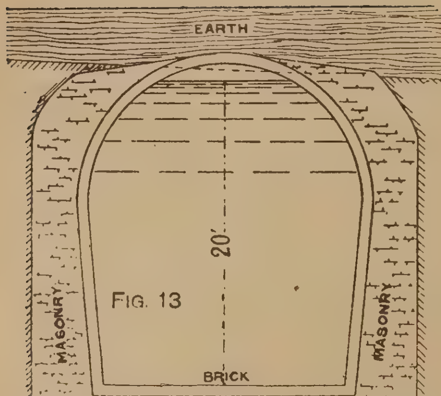

FIG. 13

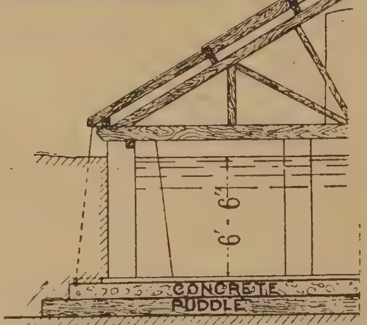

FIG. 14

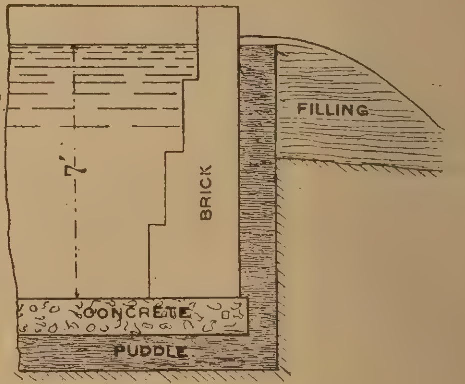

FIG. 15

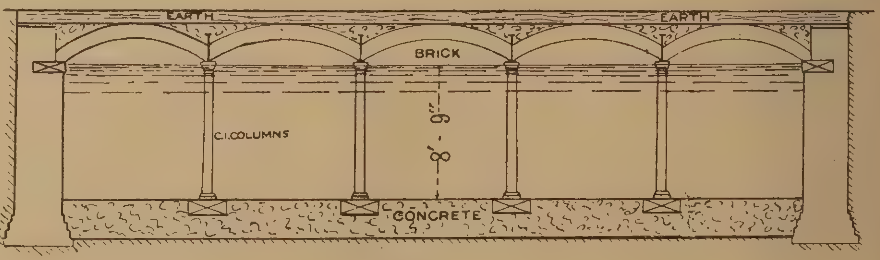

FIG. 16

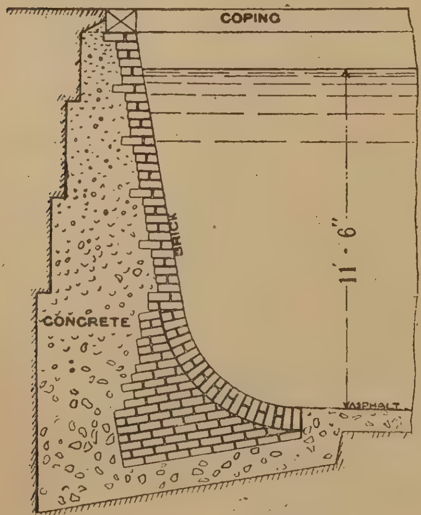

FIG. 17

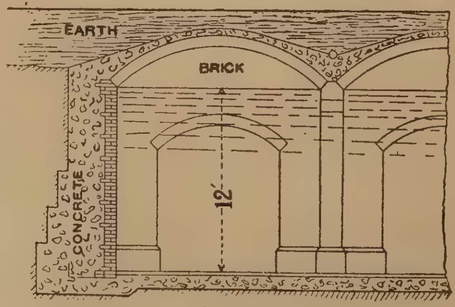

FIG. 18

FIG. 11. CARDIFF WATERWORKS.
FIG. 12. TORQUAY WATERWORKS.
FIG. 13. BATH WATERWORKS.
FIG. 14. CHELMSFORD WATERWORKS (DANBURY).
FIG. 15. CHELMSFORD WATERWORKS (RETTENDON).
FIG. 16. COVERED RESERVOIR.
FIG. 17. DEVONPORT WATERWORKS (BELLIVER).
FIG. 18. DEVONPORT WATERWORKS (BEACON).

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* Proceedings, Institution of Civil Engineers, vol. cxxiv.

16,000,000 gals., and is built in the French Renaissance style with elaborate enrichments. There are three tiers of tanks, each tier being divided into four compartments, 135ft sq. and 13ft. deep, each tank containing about 1,324,000. gals. Each tank is supported upon cast-iron columns, connected together with plate girders. The range of temperature is about 70 degs. F., and the arrangements for dealing with expansion are very neat. In Paris there are several reservoirs of this class, that at Montmartre being, perhaps, the best example. A large number of examples of service reservoirs will also be found in a paper by Mr. W. Morris on "Covered Service Reservoirs," in the Proceedings of the Institution of Civil Engineers, vol. lxxiii.

Masters and Men.

The Management of the Penrhyn Quarries state that they have no difficulty in meeting orders, and the steamer service from Port Penrhyn is regularly maintained.

The Four Cardiff Branches of Builders' Labourers in connection with the Navvies and General Labourers' Union have given notice to the masters for an advance of wages of one penny per hour, to come into force on May 1st.

The Master-Builders of Gloucester have given notice to the different trades for an alteration in the time of starting work in the winter and to change the time from June to December for the expiration of notices for any proposed alterations in the working rules in future.

Perth Plasterers' Strike.—In connection with the Perth plasterers' strike, which at present prevails as to the reduction of ½d. per hour on the men's wages, an important development has taken place. Mr. Peebles, secretary of the Perth Masters' Association, recently received a note from the secretary of the Glasgow Labour Bureau stating that he noticed the masters were having trouble with their workmen in Perth at present, and that he could supply the men required to do the work. The Perth secretary wrote a reply to this letter, and at present the masters are hopeful of the places of those on strike being filled.

A Lock-Out at Maidstone.—The largest firm in Maidstone locked its men out last week because they arrived at 8.30 instead of 8 a.m., the time fixed by the Master-Builders' Association. Other firms followed their action, and the Masters' Association has resolved that there shall be a general lock-out of carpenters, joiners and bricklayers. The men had expressed their willingness to begin work during the present month at 7.30 if they were allowed from 8.30 till 9 o'clock for breakfast, but the masters would not agree to this. The dispute affects several hundred bricklayers and carpenters belonging to trades-unions.

The Glasgow Exhibition Plumbing Dispute.—Sheriff Balfour, the arbitrator between the Master and Operative Plumbers' Associations in Glasgow, has given his award with reference to a dispute which arose out of the Glasgow Exhibition work regarding the question of payment of operative plumbers for work done by night-shift. The dispute arose as follows:—Certain operatives were employed by Mr. Renfrew, the plumber, at the Glasgow Exhibition, and in consequence of the requirements of the Exhibition they were unable to work during the day and so worked during the night. They were paid on the footing of receiving the usual wages for fifty-one hours per week and time-and-half for the time wrought after the fifty-one hours, and offered 1s. per night extra. They received the payment under protest, and claimed to be paid time-and-half for all night-work, without reference to working fifty-one hours in the week. Nothing was said in the rules as to night-shifts except as to payment over fifty-one hours. The arbitrator considers the payment made fair and reasonable, and that the men are not entitled to time-and-half for the whole of the night-work.

Labour in the Colonies.—The January circulars of the Emigrants' Information Office, 31, Broadway, Westminster, S.W., and the annual editions of the penny handbooks, show the present prospects of emigration. A new handbook on the West African Colonies has just been issued. It is too early in the year for the ordinary emigrant to emigrate to Canada in search of employment. The report for 1900, recently issued under the Factories Act, shows that the numbers of factories and employees in New South Wales comprised within the Act both increased, and that trades were generally prosperous. Improvement was shown in the building trade. In Sydney wages in many trades, as the building trade, have risen, but wage-earners complain that the cost of living is rising in greater proportion owing to the proposed new Federal Tariff. The building trade is now less active than it was, but all other trades continue to be fairly well employed, and there is still some opening for general mechanics, plumbers, joiners, carpenters and good labourers. In Victoria there is no general demand for more labour, but a competent mechanic has not much difficulty in finding work. The Boards appointed under the Factories Act have fixed the lowest wages to be paid to labourers in the pottery trade at 40s. per week of forty-eight hours, and to females over twenty years of age employed in the making of tiles at 17s. 6d. per week of forty-eight hours. The annual report of the Inspector of Factories for 1900 states that the numbers of employees and of factories were both larger than in any previous year, showing that there had been a steady improvement in trade. In South Australia there is practically no demand for more mechanics in the towns, but a skilled hand, such as a mason, bricklayer, engine fitter, blacksmith, joiner or carpenter, can generally find employment after looking about for a little. In Queensland, owing mainly to the scarcity of employment caused by the long drought, the general supply of labour is in excess of the demand. The report of the Government Labour Bureau in Western Australia for the quarter ending 30th September last shows as follows: There is a demand for men in the building and other trades at Northam, York, and two or three other places, but the supply of men is sufficient at Perth, Fremantle, Albany and all other towns; while at Coolgardie, Kalgoorlie, Boulder and Collie the supply is in some cases actually greater than the demand. In New Zealand the building trades have been busy almost everywhere (but not at Wellington or Dunedin), and at Invercargill bricklayers have been in demand. The engineering trade is not giving full employment to men at Dunedin and Wellington; but elsewhere it is fairly good, and in Auckland blacksmithing and boilermaking have been brisk. No one is now allowed to land in South Africa without a permit. This must be applied for at the Permit Office, 39, Victoria Street, London, S.W. The applicant must possess £100, or prove that he is in a position to maintain himself in South Africa. Applicants living within fifty miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland. Only refugees, Government employees and persons engaged in a service of a public nature will be permitted to proceed to the Transvaal.

The Article on Albi Cathedral which appeared in our issue for December 18th last was written by Mr. Hubert C. Corlette, A.R.I.B.A., and formed part of his article in The Architectural Review for November, 1900; to which issue we would refer those readers who desire additional particulars and further illustrations of this interesting building.

The New Patent Office Library was opened to the public last Thursday. The building occupies the site of the old premises facing Southampton Buildings, off Chancery Lane, and has a frontage of 130ft. It is built of ivory-white bricks and Portland stone. The library itself is 140ft. long, 59ft. 6in. wide and 75ft. high. Around the sides run two galleries, carried by rows of ornamental cast-iron columns with Corinthian capitals. The galleries running the length of the library on either side are 19ft. wide, whilst those at the ends, which have no other purpose than to connect the sides, are 6ft. wide. Two cast-iron staircases, one at each end of the hall, lead to the galleries. Under the present arrangements the public will only be admitted to the ground floor and the first gallery. The second gallery will be only accessible to the staff. The cost of the new buildings has been about £160,000.

New Patents.

These patents are open to opposition until February 18th.

1901.—Sewage Treatment.—517. F. Candy, 56. Nightingale Lane, Balham, London, S.W. One part of this invention relates to the addition of residue ("burnt-out ash") to the sewage, which is then passed on to bacteria beds. The rest of the invention concerns improvements in automatic apparatus for effecting intermittent or periodical discharge of liquid stored in a tank or conduit. Float-actuated mechanism is combined with a discharge valve and tipping vessel, so that the discharge of the latter is simultaneous with the closing of the valve when the liquid has descended to a predetermined level.

Portland Cement.—2,409. H. E. Ziisager, 70, H.C. Oerstedsvej, Frederiksberg, Copenhagen. One (or all) of the raw materials is reduced in its natural moist state, without drying. The materials are then ground and mixed in tube-mills, with the addition of the least possible quantity of water; and the thick sludge so obtained is burnt in rotary kilns, and afterwards ground. This process is claimed to be more trustworthy, simpler and cheaper than those in vogue.

Floor Cramps.—3,106. T. Potter, 5, Outram Road, Croydon. This cramp is intended for use with boards nailed direct to concrete, or where the spaces between ordinary joists are filled up flush, or where "counter-flooring" is employed—in which cases the ordinary cramp cannot be used. This cramp therefore consists of a lever arm which is pivoted by a pin passed through a length of timber which is laid just above the boards, with one end against a wall or other support. The lever has an automatic strut or stay to hold it in position.

Pipe Joints under Pressure.—18,017. C. Radcliffe, 23, Dumfries Place, and D. Pugh, 209, Carlisle Street; both of Cardiff. Over the joint a pair of cone-backed flanges are adapted to be forced together longitudinally by a clamp which is in two halves drawn together laterally.

The following specifications were published on Saturday last, and are open to opposition until February 24th. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1900.—23,198, McPhail, treatment of sewage &c. 23,435, Key, ventilation of buildings. 23,827, Robertson & Robertson, machines for bending pipes and other articles.

1901.—457, Brookes (*Hörisch*), hardening artificial stone. 961, Wilson street and other gas lamps. 1,096, Webb, lamp heads particularly adapted to lamps for the extraction and destruction of sewer gas. 1,401, Stevens, Major, Stevens & Stevens, controlling arrangements for electric lifts. 1,588, Thompson drain-pipes or conduits. 2,500, Jenkins portable buildings. 2,617, Eadie & Tannahill, pipe joints. 3,014, Waine, locks and latches. 3,029, Cliff & Reynolds, lavatory basins, baths, &c. 3,539, Fryer & McKeggie, windows. 3,620, Melsom, paving blocks for tramways. 3,768, Michaelis, hydraulic cement. 3,811 Tomlinson & Tomlinson, reversible sash windows. 5,782, Rothwell & Rothwell, device for displaying and contrasting designs or tints for mural decorations. 9,523, Kosiol & Randall, sink overflows and wastes. 13,773, Douglas, Venetian blinds. 16,732, Whitehead, sash-fasteners. 17,570, Reavis, fireproof structures. 18,156, Morgan, apparatus for hoisting and conveying. 19,087, Schmidt, ventilating offices. 19,126, Gay, automatic saw guide. 20,122, Viewig, hinges. 21,441, Cutler, means for locking stop-cocks. 22,048, Lake (*Frazzi*), floors, ceilings, &c. 22,827, Anderson, combined hollow brick and tile-facing for walls. 22,830, Anderson, combined ventilated and drained brick-tile paving blocks for streets, &c. 22,981, Rossmann, resilient plates for building purposes. 23,402, Campbell, sinks.

The Rebuilding of London that is now in progress is characterised by Mr. Max Beerbohm as "ruthless ruin."

Keystones.

Mr. William Groom, of Aylesbury, who carried on the business of a builder at Leighton Buzzard for many years, died recently at the age of seventy-eight years.

The Affairs of Mr. L. F. Shove, architect, of Bristol, were considered at an adjourned meeting of creditors held last week at the Official Receiver's office.

A New Hospital at Sutton has been erected in Hill Road. Mr. Passmore Edwards has borne the cost of the building, and Mr. Ralph C. Forster has given the site. Mr. Cecil A. Sharp was the architect, and Mr. J. B. Potter the builder, both of Sutton. It provides accommodation for twelve patients.

Partnership Dissolved.—Since January 1st last, the partnership between Messrs. Dalgleish & Dickens-Lewis, architects, of Talbot Chambers, Shrewsbury, has been dissolved, and they now practise separately at the following addresses: Mr. C. R. Dalgleish, Central Chambers, Wellington, and 18, Talbot Chambers, Shrewsbury; and Mr. G. Dickens-Lewis, 12A, Talbot Chambers, Shrewsbury.

Specifications for Fire-Resisting Buildings.—The Associated Fire Offices have drawn up two specifications for cotton mills, woollen mills, warehouses and similar buildings with the object of encouraging better fire-resisting construction. Owing to the great pressure on our space this week we are unable to print these specifications; but we hope to do so in our next issue.

Birmingham University Buildings.—In the course of the speech which he delivered last Wednesday at the annual Court of Governors of the Birmingham University, Mr. Chamberlain said that the buildings of this new university could be erected and equipped for less than £1,000,000. They had £300,000 in hand, and accordingly out of ten working blocks, of which the complete university would ultimately consist, they proposed to begin with the erection of three, and these three blocks would give them the schools of mining, metallurgy, of civil, mechanical and electrical engineering, together with the great hall of the University. Messrs. Aston Webb and Ingress Bell are the architects. Lord Calthorpe has given the site.

Decorative Art.—The Lord Lieutenant of Ireland, Earl Cadogan, in opening in Dublin last week a convention and decorative exhibition in connection with the Association of Master-Painters in Ireland, said it was a subject of sincere congratulation that the close of the nineteenth century, the beginning of which was so unsatisfactory in its influence on art as applied to decoration, should have seen the cradling of such an institution as that in connection with which they were met. He thought that outside Italy there were few towns which could show in their buildings such excellent models of the decorative art as could be found in Dublin, and he hoped that their exhibition would have its effect in the encouragement of the beautiful in buildings and in their decoration.

The Manchester Society of Architects held a meeting last Thursday, Mr. A. Darbyshire, president, in the chair. Mr. Hugh Stannus, F.R.I.BA., having been elected a Fellow of the Society, and Mr. Thomas B. Daniel an Associate, the president announced that the monthly prize for the best design for a shop-front in the competition in connection with the junior classes for design had been awarded to Mr. Claude Paterson, of Bowdon; the November subject for a band-stand was won by Mr. H. Solomon. Mr. J. D. Crace, Hon. A.R.I.B.A., then read a paper on "The Relation of Colour to Architecture," in which he emphasized the necessity of the decorator sympathizing with the object of the architect, and using his art as the handmaid of architecture, taking care that his scheme of colour design should be such as not to lead the interest to stray from the lines which expressed the structure of the building. The leading values of colour should assist in expressing the stability of the building, for directly the structure was injured the sense of repose was disturbed.

Blackpool Cemetery Competition.—Messrs. Runton & Barry, A.R.I.B.A., of Savile Chambers, Savile Street, Hull, have been awarded the first premium in this competition.

"The Past, Present and Future of British Architecture."—This, the presidential address delivered by Mr. Frank Caws, F.R.I.B.A., before the Northern Architectural Association last November (reported in our issue for November 20th), has been reprinted in pamphlet form.

Mr. Edward Sale, architect and surveyor, of Eccleston, died at his residence, Higham House, on December 27th. Deceased carried out extensive alterations at Wrightington Hall in 1860. He was retained by Mr. Thomas C. Dicconson, and finally became his agent. After some years he resumed his profession, and in 1870 he was appointed to the district surveyorship of the Leyland Hundred Highway Board.

Municipal Buildings for Hampstead. — The Hampstead Borough Council is contemplating the erection of a block of new municipal buildings, the accommodation at the Town Hall, which was erected in 1877, being now wholly insufficient. The works committee will recommend the Council to purchase a piece of land, one acre in extent, at the corner of Finchley and Lymington Roads, at a cost of £8,000 for the site.

Mr. Alfred Gilbert, R.A., has announced the subjects for his series of addresses on sculpture at the Royal Academy, the first of which will be delivered on Monday, February 17th. The quaintly-arranged titles to his six lectures read as if they were broken parts of a complete sentence; they are: (1) "Endeavour," (2) "To Accomplish," (3) "Creation," (4) "Revise and Use," (5) "Experience," (6) "To a Proper End."

Mr. John Brett, A.R.A., died last week at the age of seventy years. Mr. Brett is especially known for his studies of sea and rocks. In early life he came strongly under the influence of the Pre-Raphaelite movement. In 1859 he showed his famous "Val d'Aosta," in which he endeavoured, not without success, to carry out the principles of the Pre-Raphaelites in landscape-painting. Very few artists have tried to do this, though Holman Hunt, in addition to Brett, showed that the aims of the school could be illustrated by landscape as well as by romantic figure pictures.

The T-Square Club.—Mr. C. W. Stephenson presided at the third smoking concert of this season, which was held in the foyer of Covent Garden Theatre on Wednesday evening last. The programme was as usual excellent, and the attendance up to the average. Songs were given by Mr. James Davis, musical sketches by Mr. Ulp Smith, humorous stories by Mr. C. W. Wreford, and burlesque imitations by Mr. Arthur Helmore. The card-tricks of Mr. Fred Moore were particularly clever. The chief attraction was, however, the singing of the Maori Princess Te Rangi Pai, a new mezzo-soprano. The Committee have decided that the club concert on February 5th shall also be a "smoker," the date of the "ladies night" having been changed to March 5th.

Early Irish Architecture.—At a meeting of the Architectural Association of Ireland last week, Mr. A. Scott presiding, Mr. P. J. Lynch of Limerick, read a paper on the "Early Christian Architecture of Ireland." He claimed the style of ornamental architecture in Ireland to be anterior to the Norman Invasion, which was advanced by Petrie, yet not completely proved; but recent research on the Continent and amongst pre-Norman remains in Great Britain goes far to remove all doubts. The resemblance between Irish round towers and the Continental church towers at Ravenna, illustrated by views of both, was clearly demonstrated, and the likeness between Lombardic and Irish architecture pointed out. The direct influence of the Lombard or Comacine masters on this early architecture had yet to be proved, though in later years it was evident from the memorial slab of the master in Christ Church Cathedral a strong plea was advanced for enquiry as to whether any portions of Cormac's Chapel, Cashel, might not be tenth century, as was generally supposed, until Petrie advanced it to the twelfth century, Petrie admitting at the same time that the records might mean a restoration.

The Kursaal at Harrogate is now being erected, the memorial stone having just been laid.

The Glasgow Technical College Architectural Craftsmen's Society held a meeting last Friday. Professor Gourlay, B.Sc., A.R.I.B.A., occupied the chair. Mr. A. B. McDonald, M.Inst.C.E., civil engineer, lectured on "The Highlands of Central Europe," describing a trip down the Rhine valley through Switzerland and the Tyrol.

Dr. G. B. Longstaff has consented to fill the office of president of the National Society for Checking the Abuses of Public Advertising, rendered vacant by the retirement of Mr. Alfred Waterhouse, R.A. It is interesting to note that several large towns (including Birmingham and York) are applying for powers of control of the same nature as those which are already in force for Edinburgh and Dover.

Sheffield Society of Architects and Surveyors.—At the meeting of this Society held last Thursday (Mr. P. Marshall in the chair) it was announced that the prizes for the best sets of measured drawings of buildings in the district had been awarded as follows: 1st prize, Mr. G. R Morris; 2nd prize, Mr. D. B. Jenkinson. Mr. William Watts, F.G.S., M.I.M.E., then read his paper on "The Uses of Mortar and Concrete," printed in this issue.

A Drill Hall for the Lhanbryd Volunteer Company of the 3rd V.B. Seaforth Highlanders has been erected and fitted up at a cost of about £600. The hall proper is 60ft. long and 25ft. wide, with an open roof to the apex and showing the roof principals. It will comfortably seat about 350 persons. The contractors were:—Masons, Messrs. Davidson & Hay; carpenter, Mr. James Cameron; plasterer, Mr. Alexander M'Iver; slater, Mr. James Wilson: plumbers, Messrs. Mackenzie & Russell; painter, Mr. Alexander Forsyth.

Unlighted and Unprotected Hoardings.—In the Thames Police Court recently a builder named Abraham Davis, of 19, Aldgate, was summoned for not keeping a hoarding and fence erected by him in Christian Street, St. George's, well-lighted during the night; further, with failing to put up a platform and handrail as a footway for passengers outside the hoarding and fence. Mr. George Hay Young prosecuted on behalf of the Stepney Borough Council. Defendant was fined £5 and 44s. costs on the first summons, and £5 and 23s. on the second.

New Companies.

Oakthorpe Sanitary Pipe Co., Ltd.

Registered to acquire the business carried on by Massey & Sons at Oakthorpe, Leicestershire; and to carry on the business of manufacturers of and dealers in sanitary pipes and other earthenware, &c. Capital £5,000 in £1 shares. The first directors are H. Southerd and J. Southerd. Registered office: The Pipe Works, Oakthorpe, Leicestershire.

Blisworth and Stowe Brick and Tile Co., Ltd.

Registered to acquire the lease of certain lands at Stowe, Nine Churches, Heyford, Lower Heyford, and Gayton, Northants, and the businesses of brick, tile and lime manufacturers and merchants carried on by G. King at Stowe and Lower Heyford as the Stowe Siding Brickworks, and by G. King and W. F. E. A. Uthwatt at Gayton as the Blisworth Brick and Tile Works; and to carry on the business of brick and tile manufacturers, lime merchants, &c. Capital £10,000 in £10 shares (222 preference). No initial public issue. The first directors are G. King, W. F. E. A. Uthwatt and R. Finnegan.

Joseph Dorey & Co., Ltd.

Registered to acquire the business of builders and contractors carried on by Joseph Dorey & Co. at Brentford and elsewhere; and to carry on the business of builders' merchants, stonemasons, timber merchants, carpenters, wharfingers, &c. Capital £10,000 in £1 shares. The first directors are J. J. Dorey, C. J. Dorey, T. H. Dorey and J. H. Dorey. Registered office: Distillery Road, Brentford.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Jan. 16	Barnstaple—Electricity Buildings	Town Council	A. Thorne, Borough Surveyor, Barnstaple.
,, 16	Sidcup—Administrative Block of Children's Houses	Greenwich Union Guardians	T. Dinwiddy, 12 Crooms Hill, Greenwich, S.E.
,, 16	Hastings—Gas-Testing Station	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,, 16	Whitney-on-the-Wye—Station Master's House	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
,, 16	Kettering—Waggon Shop and Offices	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
,, 17	Southampton—Engine-bed Stones and Stone Flooring	Corporation	W. Matthews, 18 French Street, Southampton.
,, 17	Buckingham—Two Culverts, &c.	Rural District Council	T. R. Hearne, 26 West Street, Buckingham.
,, 17	Brocklesby—Enlargement of Stand	Hunt Race Committee	J. M. Holmes, Works Office, Brocklesby Park.
,, 18	Bulwell—Club Premises	Liberal Club Co., Ltd.	W. B. Starr, 12 St. Peter's Gate, Bulwell.
,, 18	Cleckheaton, Yorks—Warehouse	——	T. Barker & Son, 5 Bank Street, Bradford.
,, 18	Ton, Pentre, Wales—Organ-Chamber at Hebron Chapel	——	J. Rees, Architect, Pentre.
,, 18	Aberystwyth—House	E. Lloyd	T. E. Morgan, Architect, Aberystwyth.
,, 18	Aberystwyth Block of Flats	E. Edwards	G. T. Bassett, Architect, Aberystwyth.
,, 18	Macclesfield—Extension, &c., of Bakehouse at Asylum	Committee of Visitors	H. Beswick, County Architect, Newgate Street, Chester.
,, 20	Bury—Central Tramway Depôt	Tramways Committee	A. W. Bradley, Borough Engineer, Bury.
,, 20	Brewood, Staffs—Reseating Church Nave	——	A. Veall, 84 Darlington Street, Wolverhampton.
,, 20	London, S E.—Three Underground Conveniences	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa Road, S.E.
,, 20	Nelson, Lancs—Fireclay Goods	Gas Committee	A. J. Hope, Engineer, Gasworks, Nelson.
,, 20	Bettws-y-Coed, Wales—Completion of Church Tower	——	Wright & Son, Surveyors, Lancaster.
,, 20	Cork—Additions, &c., to Department of Agriculture and Technical Instruction at Munster Institute.	——	Superintendent, Munster Institute, Cork.
,, 20	Eskdale—Hospital for Infectious Diseases	——	R. M'George, Solicitor, Langholm.
,, 20	Liverpool—Caretaker's Ho. & Laboratory Extensions.	Lancashire County Council	H. Littler, Architect, County Offices, Preston.
,, 20	Merthyr Tydfil—Mixed School, &c.	School Board	J. Ll. Smith, 50 High Street, Merthyr.
,, 20	Penarth, Wales—Infectious Diseases Hospital	Urban District Council	E. J. Evans, Surveyor, Arcade Buildings, Penarth.
,, 20	Sheffield—Pulling down and Erecting Buildings	T. A. Ashton, Ltd.	Gibbs & Flockton, 15 St. James's Row, Sheffield.
,, 20	Chelmsford - Boundary Walls	Union Guardians	Chancellor & Son, Architects, Chelmsford.
,, 21	Leeds—Repairs to Schools	School Board	W. Packer, Clerk, Board's Offices, Leeds.
,, 21	Shipley—Stonework, &c., of Retort House, &c.	Urban District Council	T. Newbigging & Son, 5 Norfolk Street, Manchester.
,, 21	Birmingham—Cement, Blue Lias Lime, Bricks, &c.	Public Works Committee	City Surveyor, Council House, Birmingham.
,, 21	Kingston-upon-Hull—School	School Board	Gelder & Kitchen, Architects, Lowgate, Hull.
,, 21	Belfast—Laundry at Workhouse	Guardians	J. O. Neeson, Clerk, Workhouse, Belfast.
,, 21	Southmolton—Alterations, &c., to Premises	Constitutional Club	F. F. J. Sanders, Architect, Southmolton.
,, 21	Llangollen—Villa Residence	——	Mr. Denny, Architect, Llangollen.
,, 21	Brighton—Shelter for Hose-Cart and Fire-Escape	Guardians	H. S. Reed, Parochial Offices, Brighton.
,, 22	Luxulyan, Cornwall—Restoration of Church	Vicar and Churchwardens	Vicar, Luxulyan.
,, 22	Canterbury—Sanitary Conveniences	Corporation	A. O. Turley, City Surveyor, Tudor Chambers, Canterbury.
,, 23	Bolton, Lancs—Retort and Fireclay Goods	Gas and Lighting Committee	W. Walch, Office Superintendent, Gas Offices, Bolton.
,, 23	Salford—Firebricks, Retorts, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
,, 23	Hull—Extension of Electric Light Works	Corporation	T. G. Milner, City Engineer, Town Hall, Hull.
,, 24	Norwich—Enlargement of Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, Westminster.
,, 25	Leigh, Lancs—Fireclay, Retorts and Bricks	Gas Committee	J. Foster, Manager, Gasworks, Leigh.
,, 25	Hartlepool—Electric Generating Station	Corporation	O. Robson, Borough Accountant, Town Hall, Hartlepool.
,, 25	Athenry, co. Galway—Five Houses	——	J. G. Skipton, Architect, Northgate Street, Athlone.
,, 27	Liverpool—Public Baths	Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool.
,, 29	Blackpool—Station	Lancs. & Yorks. & L. & N. W. Rlys.	Engineer, Lancs. and Yorks. Railway, Hunt's Bank, Manchester.
,, 30	Bristol—Enlargements of Sessional Courts and Offices	Council	H. Williams, Architect, Imperial Chambers, Corn Street, Bristol.
,, 30	Styal, Cheshire—Cottage Homes	Chorlton Union Guardians	J. B. Broadbent, 15 Cooper Street, Manchester.
,, 31	Penygraig, Wales—School	Ystradfellte School Board	T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.
	ENGINEERING:		
Jan. 16	Middleton, Lancs.—Electric Wiring, &c., Town Hall	Corporation	F. Entwistle, Town Clerk, Town Hall, Middleton.
,, 16	Barnstaple—Electrical Plant	Town Council	W. H. Trentham, 39, Victoria Street, Westminster, S.W.
,, 16	Leeds—Condensing Plant	Lighting Committee	H. Dickinson, 1 Whitehall Road, Leeds.
,, 16	Congleton—Septic Tank and Filter Bed, &c.	Union Guardians	O R. Hall, Engineer, Congleton.
,, 16	London, N.E.—Boiling Coppers at Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
,, 17	Chelmsford—Borehole Pump	Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
,, 17	London, N.W.—Electrical Plant	St. Pancras Borough Council	Electricity Department Offices, 57 Pratt Street, N.W.
,, 17	West Bromwich—Electric Tramways	Town Council	A. D. Greatorex, Borough Engineer, Town Hall, West Bromwich.
,, 17	Belfast—Electric Cables, Conduits, &c.	Gas and Electric Committee	V. A. H. McCowan, City Electrical Engineer, Belfast.
,, 17	London, E.C.—Widening London Bridge	Corporation	City Surveyor, Guildhall, E.C.
,, 18	Tamworth—Gas-lighting of Workhouse	Guardians	J. W. Godderidge, Bolebridge Street, Tamworth.
,, 18	Annalong, co. Down—Improving Harbour	County Council	County Surveyor, Courthouse, Downpatrick, co. Down.
,, 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
,, 18	Newcastle-on-Tyne—Four Hopper Barges	Tyne Improvement Commissioners	R Unwin, Secretary, Berwick Street, Newcastle-on-Tyne.
,, 20	West Hartlepool—Steam Pipes, Valves, &c.	Corporation	H. F. Friederichs, Engineer, Corporation Electricity Works, West Hartlepool.
,, 20	Salford—Chemical Fire-Engine	Fire Brigade Committee	L C. Evans, Town Clerk, Town Hall, Salford.
,, 20	Grimsby—Electrical Plant	Corporation	W. A. Vignoles, Borough Electrical Engineer, Grimsby.
,, 21	Manchester—Electric Switchboards	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
,, 21	Middlesbrough—Electric Lighting Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
,, 21	Belfast—Laundry Machinery, &c.	Guardians	J. O. Neeson, Clerk, Workhouse, Belfast.
,, 21	Colwall—Footbridges	Great Western Railway Company	Engineer, Paddington Station.
,, 21	King's Lynn—Screw Mooring in Harbour	Conservancy Board	Harbour Master, King's Lynn.
,, 22	Cromer—Improvements at the West Cliff	Protection Commissioners	Douglass & Arnott 15 Victoria Street, Westminster, S.W.
,, 22	Leytonstone—Electrical Plant	West Ham Union Guardians	F. E Hilleary Clerk, Workhouse, Leytonstone, N.E.
,, 23	Hull—Steelwork for Electric Light Works Extension	Corporation	T G. Milner, City Engineer, Town Hall, Hull.
,, 24	Clonmel, Ireland—Drainage Works, Water and Fire Mains, &c	Workhouse Guardians	T. Beary, Clerk, Boardroom, Clonmel Union.
,, 24	Barking, Essex—Electrical Generating Plant	Urban District Council	Engineer, Electricity Works, East Street, Barking.
,, 25	Hartlepool—Electrical Plant, &c.	Corporation	C. Robson, Borough Accountant, Town Hall, Hartlepool.
,, 25	Rugby—Cleaning Out, &c., Mill Dam	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
,, 25	Hull—Railway Siding	Corporation	F. J. Bancroft, City Engineer, Alfred Gelder Street, Hull.
,, 27	Ilford—Electrical Stores, &c.	Urban District Council	J. W. Benton, Clerk, Council Offices, Ilford.
,, 27	Lochgelly, Scotland—Waterworks	Magistrates and Town Council	Buchanan & Bennett, 12 Hill Street, Edinburgh.
,, 27	Pontypridd—Sulphate of Ammonia Plant	Gas Committee	E. Jones, Gas Engineer, Gas Offices, Treforest.
,, 27	Gretna, Beattock and Crawford—Superstructure of Underbridges.	Caledonian Railway Company	Company's Divisional Engineer, Princes Street Station, Edinburgh.
,, 27	Madrid—Electric Tramway Concession	Spanish Ministry of Public Works	Commercial Department, Foreign Office, S.W.
,, 28	Little Ilford—Extension of Water-Mains, &c.	City of London Burial Board	Engineer to Corporation, Guildhall, E.C.
,, 29	Amsterdam—Metal Superstructure for 4 Bridges, &c.	Netherlands Colonial Minister	Commercial Department, Foreign Office, S.W.
,, 31	Johannesburg—Carburetted Water and Gas Plant	——	Crown Agents for the Colonies, Downing Street, London.
,, 31	Paignton—Waterworks	Urban District Council	F. W. Vanistone, Engineer, Palace Chambers, Paignton.
Feb. 5	Calcutta—Waste-water Meters	Corporation	F. Gainsford, Secretary to Corporation, Calcutta.
,, 12	Newcastle-on-Tyne—Railway Bridge and Approaches	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
,, 12	Penshaw Junction and Wapping Bridge—Widening Line.	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
,, 19	Louvain, Belgium—Lighting City	——	Burgomaster, Louvain, Belgium.
Mar. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
,, 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
	FURNITURE:		
Jan. 20	Brewood—Reseating Church Nave in Oak	——	A. Veall, 84 Darlington Street, Wolverhampton.
,, 31	Withington, Lancs—Filments and Furniture at Sanatorium.	Urban District Council	J. B. Broadbent, 15 Cooper Street, Manchester.
	IRON AND STEEL:		
Jan. 16	Christiania—Bearing Beams and Axles for Amumnition Waggons.	Norwegian Government	Commercial Department, Foreign Office, S.W.
,, 17	London, E.C.—Stores, &c.	Burma Railway, Ltd.	Secretary, 76 Gresham House, Old Broad Street, E.C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL—*cont.*:		
Jan. 17	Christiania—Strews, Spikes, Nails, &c.	Intendent of the Norwegian Railway	Commercial Department, Foreign Office, S.W.
,, 17	Manchester—Iron, Steel, Files, Nails, Bolts, &c.	Ship Canal Co.	Stores Department, Manchester Docks Trafford Road, Salford.
,, 18	Sheffield—Bots, Ironmongery, Tubes, Castings, &c.	Corporation Water Committee	General Manager, Water Department, Town Hall, Sheffield.
,, 25	Hull—Cast-iron Pipes and Castings	Corporation	F. J Bancroft, City Engineer, Alfred Gelder Street, Hull.
,, 25	Birmingham—Casting, Iron and Steel Ware, &c.	Public Works Committee	City Surveyor, Council House, Birmingham.
,, 28	London, S.W.—Tramway Rails	London County Council	Clerk, County Hall, Spring Gardens, S.W.
,, 30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.
	PAINTING AND PLUMBING:		
Jan. 17	Manchester—Oil, White Lead, Pitch, Brushes, &c.	Ship Canal Co.	Stores Department, Manchester Docks, Trafford Road, Salford.
,, 18	Sheffield—Brushes, Oils, Paints, Varnishes, &c.	Corporation Water Committee	General Manager, Water Department, Town Hall, Sheffield.
,, 21	Leeds—Plumbing Repairs to Schools	School Board	W. Packer, Clerk, Board's Offices, Leeds.
,, 24	Clonmel, Ireland—Plumbing Work at Workhouse	Guardians	T. Beary, Clerk, Boardroom, Clonmel Union.
,, 27	Halifax—Painting Town Hall	Finance Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
Feb. 3	Manchester—Painting (10 Contracts)	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
	ROADS AND CARTAGE:		
Jan. 16	London, S.E.—Road Works	Lewisham Borough Council	Surveyor, Town Hall, Catford.
,, 16	Friern Barnet—Kerbing, Channelling, &c.	Urban District Council	E. J. Reynolds, Surveyor, Friern Barnet.
,, 16	Rugby—Broken Stone for Highways	Urban District Council	D. G. Macdonald, Council's Surveyor, Rugby.
,, 16	London, S.E.—Kerbing, &c.	Lewisham Borough Council	Surveyor, Town Hall, Catford.
,, 16	London, S.E.—Dust Carts, &c.	Lewisham Borough Council	Surveyor, Town Hall, Catford.
,, 17	Alnwick—Cement-Concrete Paving, &c.	Urban District Council	G. Wilson, Town Surveyor, U.D.C. Offices, Green Bat, Alnwick.
,, 17	Spilsby, Lincs—Materials	Rural District Council	T. A. Busbridge, District Surveyor, Spilsby.
,, 20	Scarborough—Widening Roads	Town Council	H. W. Smith, Borough Engineer, Town Hall, Scarborough.
,, 20	Batley, Yorks—Street Works	Town Council	O. J. Kirby, Borough Surveyor, Market Place, Batley.
,, 20	Penarth, Wales—Roads, Footpaths, &c., at Hospital	Urban District Council	E. J. Evans, Surveyor, Arcade Buildings, Penarth.
,, 21	Acton—Materials	District Council	D. J. Ebbetts, Surveyor, 242 High Street, Acton.
,, 21	Brentford—Making-up	Urban District Council	N. Parr, Surveyor, Clifton House, Boston Road, Brentford.
,, 21	Salisbury—Stones and Gravel	Rural District Council	F. Hodding, Clerk, Market House Chambers, Salisbury.
,, 23	Willenhall—Paving	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
,, 23	London, N.E.—Road-making, Kerbing, &c.	Hackney Borough Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney.
,, 23	Meridan, Coventry—Granite for Highways	Rural District Council	A. Seymour, 11 Priory Street, Coventry.
,, 25	Birmingham—Materials	Public Works Committee	City Surveyor, Council House, Birmingham.
,, 25	Hailsham, Sussex—Road Materials	Rural District Council	E. Catt, 17 London Road, Hailsham.
	SANITARY;		
Jan. 16	Congleton—Septic Tank, Filter Bed and Main Drain	Union Guardians	C. R. Hall, Engineer, Congleton.
,, 17	Kilmalcolm, Scotland—Pipe Sewers and Tunnelling	District Committee	J. Murray, Engineer, County Buildings, Paisley.
,, 18	Walsall—Sewage Tank	Corporation	Borough Surveyor, Bridge Street, Walsall.
,, 20	London, S.E.—Three Underground Conveniences	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.
,, 22	Canterbury—Sanitary Conveniences	Corporation	A C. Turley, City Surveyor, Tudor Chambers, Canterbury.
,, 22	Bury, Lancs—Brick Sewer	Sewage Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bury.
,, 22	Marlborough—Sewerage Works	Town Council	Fairbank & Son, 13 Lendal, York.
,, 24	Clonmel—Drainage Works	Guardians	E. A. Hackett, Engineer, Clonmel.
,, 25	Birmingham—Drainpipes, Gulleys, &c.	Public Works Committee	City Surveyor, Council House, Birmingham.
,, 25	Mundesley, Norfolk—Sewage Works	Erpingham Rural District Council	T. J. Goldie, Engineer, Bank Buildings, Bank Plain, Norwich.
,, 27	Hastings—Sanitary Works, &c., at School	School Board	C. A. Pigott, Architect, Saxon Chambers, St. Leonards.
	TIMBER:		
Jan. 25	Birmingham—Timber	Public Works Committee	City Surveyor, Council House, Birmingham.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 20	Dublin—Water Supply and Drainage Scheme	£50.	J. O'Neill, Clerk to North Dublin R.D.C., Boardroom, North Brunswick Street, Dublin.
,, 31	Bangor—Infants' School [Local Architects Only]	—	A. O. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
,, 31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
,, 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
,, 31	Newport, Isle of Wight—Queen Victoria Memorial	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
,, 31	Liverpool—Rebuilding Children's Infirmary [Six Architects to be Selected].	£50 each.	Colonel C. F. Bell, 17 Fenwick Street, Liverpool.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
,, 4	Mountain Ash, Wales—Municipal Offices	£75.	J. Williams, Surveyor to U.D.C., Town Hall, Mountain Ash.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

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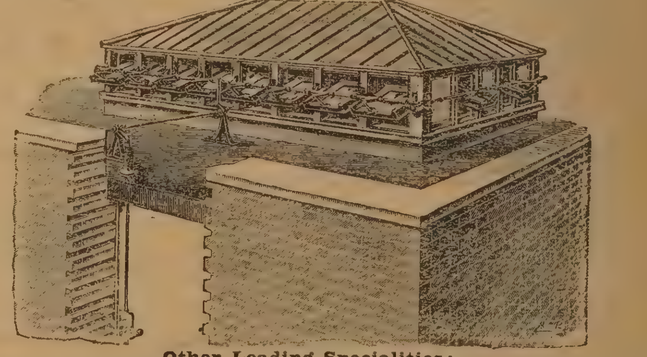

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COMING EVENTS.

Wednesday, January 15.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination (First Day).

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. James Bruce on "Recent Data concerning Concrete Beams and Concrete Floors," 7.30 p.m.

SOCIETY OF ARTS.—Mr. Frank J. Gray on "Elliptographs," 8 p m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p m.

INSTITUTE OF SANITARY ENGINEERS.—Presidential Address by Dr. J. C. Thresh, M.D., D.Sc., 7 p m

Thursday, January 16.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination (Second Day).

INSTITUTE OF BRITISH DECORATORS (NORTHERN DISTRICT).—Mr. George C. Haité on "Decoration, its Methods and Materials," 7 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Dr. N. Bodington on "Schliemann's Troy," 6.30 p.m.

CHEMICAL SOCIETY.—Mr. A. G. Perkin and Mr. S. H. C. Briggs on "The Colouring Matters of Green Ebony," at 8 p.m.

ROYAL ACADEMY.—Prof. V. C. Prinsep, R.A., on "Painting"—II., 4 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL INSTITUTION.—Dr. A. S. Murray on "Recent Excavations at Delphi and in the Greek Islands"—I., 3 p.m.

SOCIETY OF ARTS.—Mr. Francis Henry Skrine on "Bengal: The Land and its People," 4 30 p.m.

Friday, January 17.

ARCHITECTURAL ASSOCIATION.—Mr. T. C. Cunnington on "Architectural and Constructional Engineering," 7.30 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Mr. H. F. L. Orcutt, M.I.M.E., on "Modern Machine Methods," 8 p.m.

ROYAL INSTITUTION.—Lord Rayleigh on "Interference of Sound," 9 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Captain H. Riall Sankey, R.E., M.I.C.E., on "The Theory of Heat-Engines," 8 p.m.

Saturday, January 18.

ROYAL INSTITUTION.—Mr. W. H. Hadow on "History of Opera: Gluck"—I., 3 p.m.

Monday, January 20.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Award of Prizes and Studentships. Mr. Detmar J. Blow on "The Architectural Discoveries of 1901 at Stonehenge," 8 p.m.

SURVEYORS' INSTITUTION (Junior Meeting).—Mr. A. H. Dellschaft, P.A.S.I., on "Tuberculosis in Cattle," 7 p.m.

SOCIETY OF ARTS (Cantor Lectures).—Mr. Samuel Rideal, D.Sc., F.I.C., on "The Purification and Sterilization of Water"—II., 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. R. Wynne Owen, A.R.I.B.A., on "The Value and Method of Sketching."

ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW: ARCHITECTURAL SECTION.—Prof. G. G. Henderson, D.Sc., M.A., on "Chemical Notes on Building Materials," 8 p.m.

ROYAL ACADEMY.—Prof. V. C. Prinsep, R.A., on "Painting"—III., 4 p.m.

LONDON INSTITUTION.—Mr. Frederick Lambert on "The Mammoth Cave of Kentucky," 5 p.m.

VICTORIA INSTITUTE.—Mr. R. Logan Jack, LL D., F.G.S., "Artesian Wells in Queensland and their beneficial effects as sources of water-supply and irrigation," 4.30 p.m.

Tuesday, January 21.

ROYAL INSTITUTION.—Dr. Allan Macfadyen on "The Cell"—II., 3 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Meeting at 7.45 p m.

MANCHESTER SOCIETY OF ARCHITECTS (Students' Meeting).—Mr. Isaac Taylor on "The Plan of a Church."

NATIONAL REGISTRATION OF PLUMBERS: DISTRICT COUNCIL FOR CARDIFF, SOUTH WALES AND MONMOUTHSHIRE.—Mr. E. J. Manders on "Sanitation of Our Homes," 8 p.m.

SOCIETY OF ARTS (Applied Art Section).—Mr. Halsey Ricardo on "The Architect's Use of Enamelled Tiles," 8 p.m.

Wednesday, January 22.

RUSKIN SOCIETY OF BIRMINGHAM.—Mrs. Humphry Ward on "Modern Italy," 7.45 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Thomas Aldwinckle, F.R.I.B.A., on "Public Baths and Washhouses," 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, January 23.

SOCIETY OF ARCHITECTS.—Mr. A. Sullivan on "Celtic Crosses," at 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY OF ARTS (Indian Section).—Mr. Francis Henry Skrine on "Bengal: The Land and its People," 4.30 p.m.

ROYAL INSTITUTION.—Dr. A. S. Murray on "Recent Excavations at Delhi and in the Greek Islands," 3 p.m.

ROYAL ACADEMY.—Prof. V. C. Prinsep, R.A., on "Painting"—IV., 4 p.m.

Friday, January 24.

ARCHITECTURAL ASSOCIATION.—Mr. F. G. W. Buss on "The Clerk of Works, his Duties and Responsibilities," 7.30 p.m.

DEVON AND EXETER ARCHITECTURAL SOCIETY (Plymouth, Devonport and Stonehouse Branch).—Annual Dinner.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BAMBURY (OXON).—Accepted for alterations and additions to a factory in the Britannia Road, Bambury, Oxon, for Messrs. W. F. Lucas & Co. Mr. Herbert Quinton, architect and surveyor. Oxford:—

Kingerlee & Sons, Oxford	£1,876

BROADSTAIRS.—For the erection of a house, North Foreland Estate. Mr. W. H. Woodroffe, architect, Town Hall Chambers, 32 High Street, Southwark, S.E.:—

Paramor	£3,010	Padget & Son	£2,660
Stiff	3,000	Wise	2,478
Tilbury	3,000	Gann	2,445
Martin	2,793	Wing	2,437
Denne & Co.	2,690	Turner,* Walmer	2,370

* Accepted provisionally.

CHATTERIS (CAMBS).—For the erection of a board school at Chatteris, Cambs, for the Chatteris School Board Mr. W. Wren, architect, Mount Pleasant, Cambridge. Quantities by the architect:—

W. Wade, St. Neots	£2,998
W. Howard, Huntingdon	2,949
J. Cracknell, Peterborough	2,816
P. Banyard, Cambridge	2,777
Kettering Co-operative Builders, Ltd., Kettering	2,770
H. Feast, Haddenham	2,590
Coulson & Lofts, Cambridge	2,550
R. Shanks, Chatteris	2,448
Parren & Son, Earith	2,112

CHINGFORD.—Accepted for the erection of a house, Rowden Park Estate, Chingford, for Mr. J. J. Spencer. Mr. T. Wilson, architect, 34 New Bridge Street, E.C.:—

Wood	£750

COLWYN BAY.—For new chapel at Colwyn Bay. Mr. W. L. Jones, architect, Bangor:—

Evans & Griffiths, Llandudno Junction	£2,600
J. B. Jones, Colwyn Bay	2,200
Davies & Jones, Colwyn Bay	2,070
T. Jones,* Colwyn Bay	1,997

* Accepted.

CORK.—For rebuilding the John Street Sawing and Planing Mills, for Messrs. Eustace & Co. Mr. Arthur Hill, B.E., F.R.I.B.A., architect, 22 Georges Street, Cork:—

P. Lynch	£5,200	Delany & Co.	£4,451
D. Hegarty	4,900	S. Hill	4,380
D. O'Callagan	4,547	E. & P. O'Flynn*	4,360
P. Murphy	4,455		

* Accepted.

HULL.—For the erection of pavilions, &c., for the Infirmary Board. Messrs. T. Worthington & Son, architects, 46 Brown Street, Manchester. Quantities by Mr. John Watson, surveyor, Hull:—

Armitage & Hodgson	£26,870	15	8
A. Lyons	26,839	0	0
Exors. T. Southern	26,152	0	5
G. Houlton	25,118	0	0
Bowman & Sons	24,708	0	0
T. Goates	24,568	0	0
Blackburn & Son	24,523	0	9
Good & Sons, Ltd.	24,103	4	11
M. Harper	23,688	0	9
I. T. Levitt	23,509	19	1
F. Beilby,* Hull	23,047	12	1

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TENDERS—*cont.*

LONDON, N.W.—For the erection of chimney shaft, electricity works, Taylor's Lane, for the Willesden Urban District Council. Mr. O. Claude Robson, engineer:—

Neil & Co.	£8,324	Martin, Wells & Co.	£5,984
Wilson Bros. & Co.	7,979	B. E. Nightingale	5,945
Myles & Warner	7,285	Pattinson & Son	5,743
Foster Bros.	7,280	Wilkinson Bros.	5,700
S. W. Moscrip	6,637	Allen & Sons	5,685
Storres, Son & Co.	6,569	C. G. Hill	5,597
Smith & Sons	6,132	Godson & Sons	5,562
J. & M. Patrick	6,099	F. G. Minter	5,390
Patman & Fotheringham	6,085	Johnson & Son*	5,364

* Accepted.

LONDON, N.W.—For the erection of sub-station, electricity works, Salusbury Road, for the Willesden Urban District Council. Mr. O. Claude Robson, engineer:—

S. W. Moscrip	£15,018	Foster Bros.	£13,280
J. & M. Patrick	14,920	F. G. Minter	13,257
Godson & Sons	14,100	Martin, Wells & Co.	13,126
Patman & Fotheringham	14,100	G. Neal	13,118
Smith & Sons	14,031	Pattinson & Son	12,943
C. G. Hill	13,529	Johnson & Son	12,875
Simpson & Sons	13,373	B. E. Nightingale	12,290
Allen & Sons	13,365	Braid, Pater & Co.*	11,300

* Accepted.

LONDON, N.W.—For the erection of main station, electricity works, Taylor's Lane, for the Willesden Urban District Council. Mr. O. Claude Robson, engineer:—

S. W. Moscrip	£38,487	J. & M. Patrick	£32,899
Foster Bros.	36,880	C. G. Hill	31,897
Patman & Fotheringham	36,701	F. G. Minter	31,890
Smith & Sons	35,824	Johnson & Son	31,250
Godson & Sons	35,150	Wilkinson Bros.	30,900
Allen & Sons	34,500	B. E. Nightingale	30,219
Martin, Wells & Co.	32,942	Pattinson & Son*	29,933

* Accepted.

LONDON, N.W.—For alterations and additions to the isolation hospital, for the Willesden Urban District Council. Mr. O. Claude Robson, engineer:—

Godson & Sons	£30,474	0	0
S. W. Moscrip	30,427	11	4
Simpson & Son	28,761	0	0
H. Martin	27,272	0	0
C. Brightman	27,200	0	0
Johnson & Son	26,620	0	0
Sabey & Son	26,615	0	0
B. E. Nightingale	26,212	0	0
Gibb & Co.*	25,815	0	0

* Accepted.

OSWESTRY.—For the erection of new business premises, Leg Street, Oswestry. Mr. W. H. Spaull, F.R.I.B.A., architect, The Gables, Oswestry:—

W. Felton	£1,785	0	0
W. H. Thomas	1,648	10	6
J. Higgins	1,620	0	0
Jones & Evans*	1,614	0	0

* Accepted. [All of Oswestry.]

OSWESTRY.—For the erection of Freemasons' Hall, Oswestry Mr. W. H. Spaull, F.R.I.B.A., architect, The Gables, Oswestry:—

W. Bowdler, Shrewsbury	£2,277	0	0
W. H. Thomas	1,835	0	0
W. Felton	1,820	10	0
Jones & Evans	1,798	10	0
W. Griffiths & Son,* Ellesmere	1,750	0	0

* Accepted. [Rest of Oswestry.]

PENARTH (WALES).—For the erection of a house in Victoria Road, Penarth. Messrs. Seddon & Carter, architects, Bank Buildings, Cardiff:—

J. S. Shepton, Station Road, Penarth	£1,549
G. Couzens & Co., Riverside Works, Cardiff	1,470
J. Jones, Station Road, Penarth	1,444
F. Couzens, 59 Cowbridge Road	1,435
Knox & Wells, Bangor Street, Cardiff	1,347
E. Turner & Sons,* Penarth Road, Cardiff	1,344

* Accepted.

SEAFORD.—For alterations and additions to the boys' schools, for the Seaford School Board. Messrs. T. Simpson & Son, architects, Brighton:—

W. A. Field & Co., Brighton	£2,570	0
Peerless, Dennis & Co., Eastbourne	2,548	0
C. Marling, Seaford	2,436	10
A. Wilkinson, Seaford	2,249	18
S. H. Berry, Seaford	2,213	0

SOUTHAMPTON.—For the erection of library buildings at Southampton:—

H. Clark & Son, Claxton Street, Portsmouth	£3,443	0	0
Dowdall & Son, Bedford Place	2,890	5	4
Jenkins & Sons, Ltd., Above Bar	2,774	0	0
J. Nichol, Bitterne Park	2,744	0	0
J. Douglas, Portswood Avenue	2,743	0	0
H. Stevens & Co., Millbank Works	2,685	0	0
J. J. Udall & Co., Carlton Place	2,580	0	0
H. J. Hood, Charlton Road	2,565	0	0
Dyer & Sons,* Belvois Hill	2,489	0	0

* Under consideration. [Rest of Southampton.]

WALTHAMSTOW.—For the erection and completion of Sunday schools, for the Trustees of the United Methodist Free Church. Mr. J. Williams Dunford, architect, Queen Victoria Street, E.C.:—

W. Shurmur	£3,893
S. J. Scott	3,799
J. Reed	3,740
F. J. Coxhead	3,697
Sands, Palmer & Co.	3,690

WATFORD.—For the erection of a new boys' department (to accommodate 600) at the Watford Victoria Board School, for the Watford School Board. Mr. John Hunt, A.R.I.B.A., architect, 40 Upper Baker Street, London, N.W.:—

S. W. Moscrip, London	£8,856	16
G. Wiggs	8,298	0
F. Dupont & Co.	8,218	0
Holliday & Greenwood, Ltd., London	7,929	0
J. Smith & Sons, Ltd., London	7,519	0
Tyler & White	7,500	0
H. Martin, Northampton	7,308	0
Martin, Wells & Co., Ltd., London	7,243	0
Patman & Fotheringham, Ltd., London	7,128	0
J. Appleby, London	7,093	0
J. Parnell & Son, Rugby	7,064	0
C. Eames	6,956	0
J. Honour & Son, Tring	6,933	0
Clifford & Gough	6,899	0
G. & J. Waterman	6,867	0
Coulson & Lofts, Cambridge	6,751	18
C. Brightman	6,638	0
R. L. Tonge*	6,508	0
R. M. Hughes, Birmingham	6,461	0

Heating.

J. Metcalf, Preston	407	0
E. W. Beer & Co., London	384	10
J. Wontney-Smith, Gray & Co., London	377	0
Wenham & Waters, Ltd.,* London	340	0

* Accepted. [Rest of Watford.]

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Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels ..	do	1	9	0		—	
Petroleum, American ..	per gal.	0	0	6⅞	0	0	7
Bo. Russian ..	do.	0	0	5⅞	0	0	6
Pitch	per barrel	0	7	0		—	
Shellac, orange	per cwt.	6	5	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	11	6		—	
Tar, Stockholm	per barrel	1	3	0	1	3	6
Turpentine	per cwt.	1	8	3		—	

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Copper, sheet, strong ..	per ton	66	0	0		—	
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Do. Galvanised Corrugated sheet ..	do.	11	0	0		—	
Lead, pig, Soft Foreign ..	do.	10	8	9	10	10	0
Do. do. English common brands	do.	10	17	6		—	
Do. sheet, English 3lb per sq. ft. and upwards	per ton	11	17	6		—	
Do. pipe	do.	12	5	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	0	0		—	
Do floor brads	do.	8	15	0		—	
Steel, Staffs., Girders and Angles	do.	5	15	0	6	5	0
Do. Do. Mild bars	do.	6	10	0	7	5	0
Tin, Foreign	do.	103	0	0	100	3	10
Do. English ingots ..	do.	106	0	0	106	10	0
Zinc, sheets, Silesian ..	do.	21	0	0		—	
Do. do. Vieille Montaigne	do.	21	10	0		—	
Do. Spelter	do.	16	7	6	16	17	6

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Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	0	0		—	
Do. do. 2nd „	do.	12	10	0		—	
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea ..	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st ..	do.	27	5	0		—	
Do. do. 2nd ..	do.	12	15	10	13	0	0
Do. do. 3rd &c.	do.	9	10	0		—	
Do. Canadian Spruce. 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	7	15	0	9	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
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Do. 2nd ..	do.	0	10			—	
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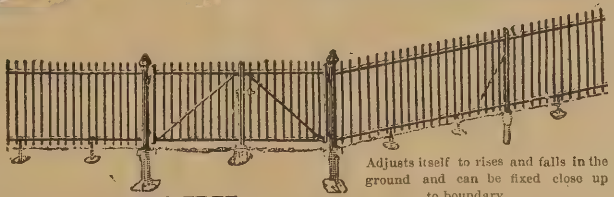

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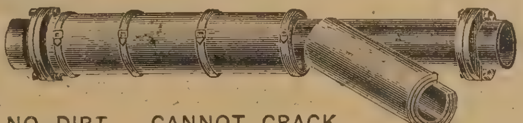

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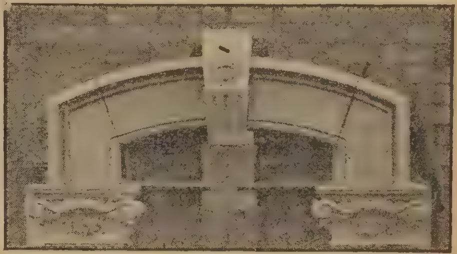

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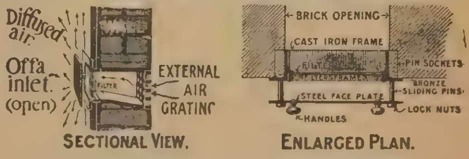

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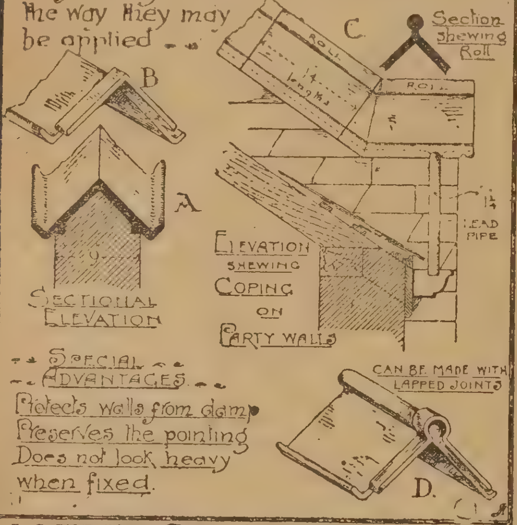
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C.
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ROLL
A
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THE JANUARY ISSUE

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AND CONTAINS AN IMPORTANT ARTICLE BY

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. . . ON . . .

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JAN. 22, 1902.
No. 363.

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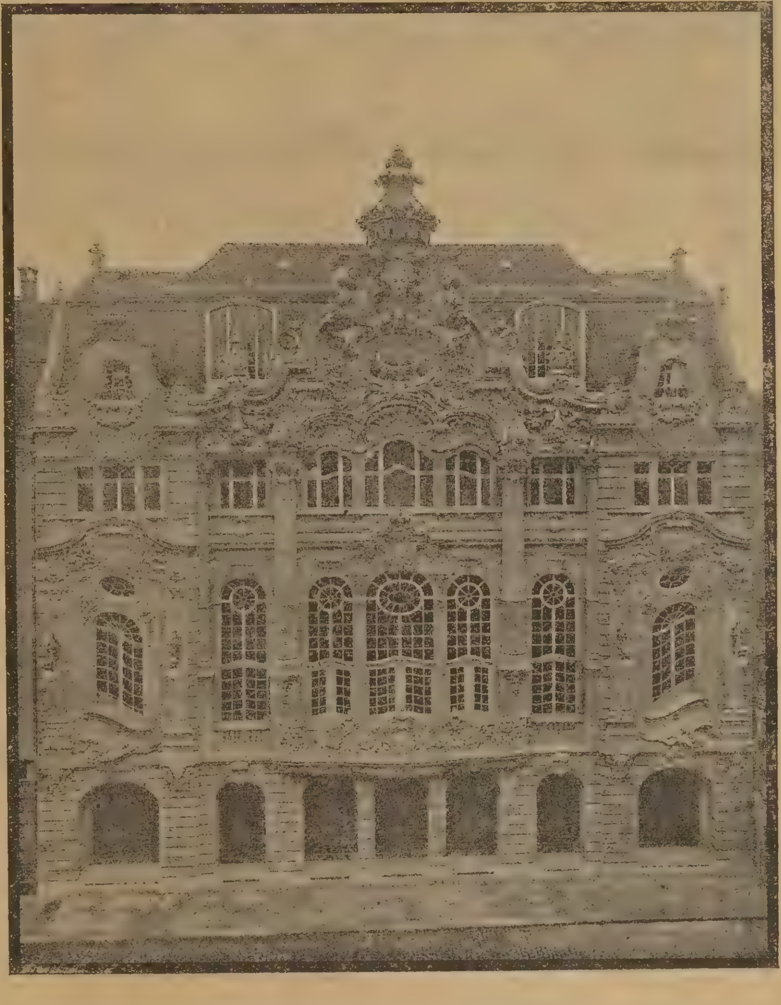
An Architectural Causerie.

Archæology and Architecture. ONE can hardly find two studies so closely allied to and dependent on one another as archæology and architecture, the first being too often neglected by the architect as being outside his scope, and the second very often monopolised by the archæologist, who, instead of co-working with an architect as such, puts his walls and excavations into the category of his own following. The classical learning implied by the term "archæology" is only a supplement to the science of architecture, and the only dividing line between the two would seem to be, that on the various objects of antiquity found within the buildings the architect can have no claim; and the archæologist's knowledge of such objects will serve him little in getting at the facts to be learned from excavated sites, where the plan of a former building is often all there is to be traced. We too often hear that such and such a point in connection with a mediæval building, even, is a question for the archæologist, when in reality it should have been an architect's business and delight to deal with. In all questions as to the development of planning lies the architect's province; and if on occasion he has to call in an archæologist to settle some abstruse point, that is no reason for his handing over the whole study to him. The archæologist's vocation is such a fascinating one that it would be hardly diminishing it were architecture to involve some of the points. Thus, architectural students study and draw the Parthenon with exactitude (more or less) from plates and diagrams—that is, they treat it as a piece of architecture—the highest example of architecture. But that done, it is forgotten by them, and to-day the Parthenon would only seem to be the affair of the archæological world. It is no longer a building, but a breath from the past; a sacred remnant to the archæologist—but what to the architect? What should it not be? One hears stories of the effect produced on sculptors on seeing the Hermes of Praxiteles at Olympia for the first time. They immediately go home and start an *Apollo* or something. Has the Parthenon ever inspired an architect in the same manner? Without declaring ourselves, we would say that it is rather as an archæologist that the architect visits the Acropolis and commences to note the entasis of the columns and the thousand other "optical refinements" that are in his note-book at home; and if seen in any modern building they are in almost every instance exaggerated — otherwise the "refinements" would not be seen. Surely the archæologist has enough without claiming the very *buildings* of antiquity! What with his coins, his gems, terracottas, bronzes, heads, torsos and fragments, his vases which occupy so great a portion of his time in placing together the thousand pieces thereof—with all these objects requiring so much of his care and delicate handling, it is perhaps not surprising that the archæologist should take supreme interest in the *chef d'œuvre* of the people of his studies and research; but he might remember that such an item as the Parthenon is strictly the architect's and should be looked on by him in the same way that an architect would and does regard, say, a Mycenæan pot from Crete or a coin dug up from some excavations on Classical soil. Crete affords an instance very much to the point. The result of Mr. Evans's continued probings into so-called Mycenæan and pre-Mycenæan ages have revealed stone staircases among the Palace at Knossos—a fact far more interesting and vital to the architect than to any body of archæologists. It is curious that, in Gothic architecture, there is not the same archæological monopoly of our cathedrals and abbeys, even when in a ruined state; and mediæval archæology does, on the whole, seem to work more hand in hand with architecture than classical archæology does. In fact, to take an extreme case far back beyond mediæval times, Stonehenge has received more attention in an architectural sense—that is, discussing it as architecture—than has the Parthenon in its present condition. Architectural societies have not been at all concerned about the recent restoration of the Parthenon, one of the most influential buildings on architecture for all ages. But Stonehenge, which could very safely be left to archæologists to deal with, has concerned them greatly. Of course Stonehenge is at home and Athens far away; and whereas we continually get foreign telegrams in the press concerning political affairs there, it is very rare that one hears of the work of the various "Foreign Schools" at Athens. Where archæological and architectural societies could work together would be in the publication of pamphlets giving a little more light on the various works being done on different soils, in addition to their regular "Journals," which only find their way to the specialist or very keen enthusiast and not to the members of the architectural world generally, who only require more data given them to take more interest in buildings which really belong to them and not to the archæologist. These pamphlets should give references to our museums in lieu of photographic illustrations—tending by this to make the galleries at Bloomsbury or South Kensington much more largely used *for what they contain* and not for idly passing an odd hour or so in a promenading panoramic review.

M**. J.



MODERN GERMAN ARCHITECTURE!
CENTRAL THEATRE, DRESDEN. LOSSOW AND VICHWEGER, ARCHITECTS.

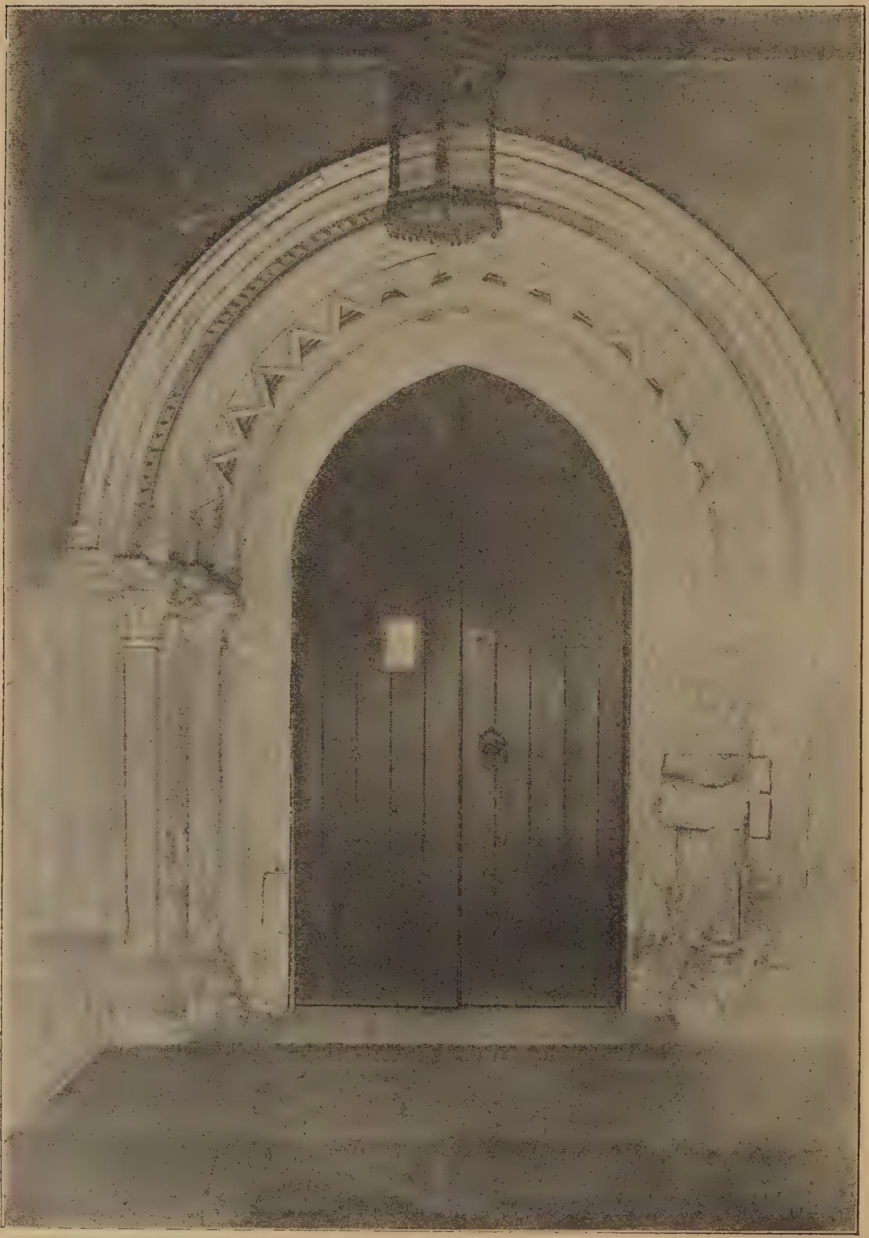
Hysterical Architecture. THERE is scarcely any need to say that we do not publish the illustration of the new Central Theatre at Dresden as a specimen of fine architecture, but rather to show what Continental architects are capable of perpetrating under the name of "Secessionism"; and though it would be totally unfair to brand all German architects with so writhing a taste, the fact should not be forgotten that this building is no mere doll's house, but a theatre of considerable size, which makes the selection all the more astonishing. The architects have tried to express the functions of the interior with a vengeance—especially in the stair windows—but their efforts are so wild and so utterly dominated by originality-at-all-cost that, instead of architecture, they have produced a wedding-cake in stone.

A I

THE TRANSITIONAL DOOR AT ORPINGTON CHURCH, KENT.

BY J. RUSSELL LARKBY.

ALTHOUGH by no means a period of architecture to be studied as a model for modern workmen, the Transitional detail as exhibited in some of our ancient churches is interesting and valuable as showing the approach to a form of art with which every architectural student makes himself conversant. The Transitional period is often spoken of as a style; but if one makes even a superficial enquiry it will at once be seen that the architecture of the latter part of the twelfth century cannot in any way be called a "style"; almost every feature of architecture was at that time undergoing a slow but complete change. There are, of course, features found in Transitional work—and beautiful features—not seen in earlier or later times, but this is the outcome of the fact that the late twelfth-century artist took what was good of the Norman style and blended it, after his fashion, with the developing beauty of the embryo Early English art. So, then, one may say that the insular features of Transitional architecture merely represent the merging of one style of art into another, rather than the creation of an altogether new school of thought. But if one is inclined to decry the copying of Transitional work, it must not be forgotten that the latter part of the twelfth century was an important period for English architecture, and should be placed on a much higher plane than the period of transition from Early English to Decorated work. It should not be forgotten that not only the minor details were changed during the years 1160-85, but also that the change affected even the plan appearance of buildings. A comparison readily suggests itself between the solid Norman nave of Durham and the chaste beauty of the nave at Wells. Both have individual character marking the work of two different periods, and a connecting link can be pointed to in the Transitional Galilee of Durham, which contains some of the heaviness of the one blended with a shadow of the beauty in the other.



WEST DOOR, ORPINGTON CHURCH, KENT.

Attention may now be drawn to the simple example illustrated by the accompanying sketches, which, it is hoped, will show to a small extent the bold Norman work passing under the softening influence of Early English art.

It is not difficult to place one's hand on certain details and pronounce them to be purely Norman or purely Early English, so well is the Transitional period in evidence. Thus, as evidence of the Norman style, we have (1) the recessed character of the mouldings, as shown by the dotted lines in the section (Fig. 1); (2) the bold chevron with the points resting on the inner pear-shaped mouldings; (3) the square abaci of the shafts; (4) the bases of the same, especially those of the north jamb, which, although much decayed, seem to consist of two plain squares simply chamfered off at the edges and angles.

As evidence of the Early English art, we have—

(1) The deep and excellent workings of the mouldings, two of which are pear-shaped.

(2) The use of dog-tooth ornament.

(3) The foliage, especially that of the northern capitals, which shows an approach to pure stiff-leaved work. The carving is perhaps roughly executed, but at the same time has considerable grace and freedom. The use of the fully-developed trefoil and lobe is sufficient to indicate a very considerable Early English influence (see Fig. 2).

(4) The use of the pointed arch. This, however, cannot be taken as wholly good evidence; but as there is no apparent reason for the use of the pointed arch, it is included as evidence of Early English work. It is interesting to note that a round-headed Early English arch occurs in the chancel of this church, showing how little the form of an arch is to be depended upon as evidence of style.

(5) The bases of the southern capitals. These are interesting, but somewhat decayed; they are of a form which, taken alone, would be pure Early English. As shown in Fig. 3, they consist of a round, a deep hollow, and a larger round, the last answering the "water-holding" test. Attached to the lower member is a tongue covering the space made by the projection of the plinth. The form is perhaps more Norman than Early English, resembling to a certain extent some Norman foot ornaments at Malpas Church, Monmouthshire.*

Some similar examples occur in the Transitional bases in the corona of Canterbury Cathedral. The Orpington specimens, therefore, seem to be the stage between the Norman and Early English foot ornaments; not exactly like either, but bearing a resemblance to both, occupying precisely that mid-way position one would expect in a work of Transitional date.

As an artistic effort, the work is undoubtedly a success; there is just that sufficiency of detail requisite to convey an impression of richness without vulgar display. If any criticism may be offered, it is on the rather disturbing way in which the bold chevron-moulding forces its point on the inner pear-shaped member, and presenting a number of spots of shade rather than one continuous line of shadow. The Transitional architect had evidently not learnt to handle his moulding with the consummate skill of his immediate successors.

Having now drawn attention to the chief decorative features of this interesting doorway, it remains to deal with certain other details which have a sort of melancholy interest, inasmuch as, instead of being of a constructional character, they seem to have had a destructive object. It should be remembered that in the sixteenth century and later times man's efforts to preserve ecclesiastical art seem to have been in inverse ratio to the beauty of the objects with which he came into contact. There are two reasons for this—either a hatred of anything having any connection with pre-Reformation times, or a hatred of art for its own sake. The results of both species of intelligence are fairly evident at Orpington.

The first structural alteration in the door was made during the fifteenth century, when the south pillar was mutilated to an alarming extent in order to insert a stoup. To do this it was seemingly considered necessary to entirely remove about 3ft. of the shaft, and also the faces of at least six jamb-stones. The alterations, too, may possibly have caused the mutilation of the capital, all detail of which has disappeared.

As the doorway now stands it is evident that it has received most unfair treatment. Not only are the capitals and bases much damaged, but the tooth ornaments have received odious attention. Out of about ninety individuals forty-three have been removed either by the slow process of time or, as one shrewdly suspects, by human agency in the sixteenth century. But these unfortunate fanatics must not bear all the blame; on the door-jambs and shafts are scribbled in decrepid writing the initials and

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* "Some Monmouthshire Sketches," by J. R. Larkby. "Reliquary," June, 1900.

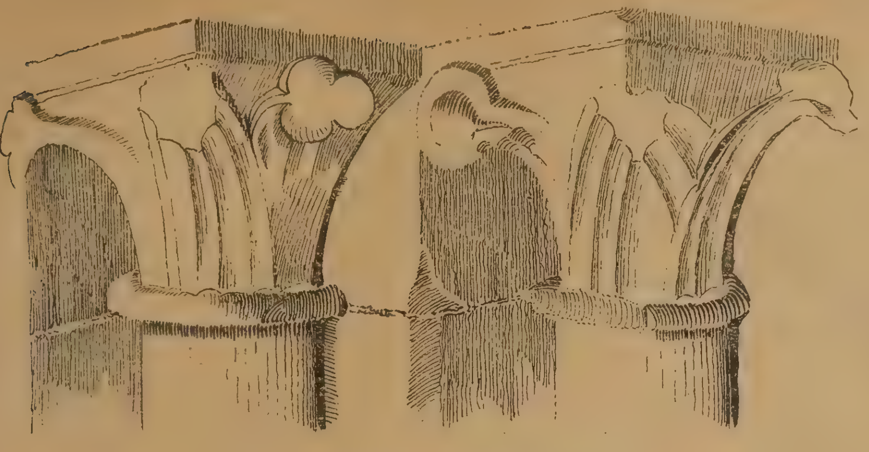


FIG. 2.—CAPITALS OF NORTH JAMB.

names of those poor people who may some day fall into the hands of the long-suffering antiquary. Another particularly annoying piece of modern foolishness is the scratching of crosses on doorways in mere imitation of the ancient consecration cross. On the south jamb of the Orpington door, and about 4ft. from the ground, is the genuine consecration cross accompanied by some modern imitations; a careful examination by the aid of a magnifying glass will generally reveal the difference between the genuine cross and the modern counterfeit.

The foregoing remarks touch all the important points of this interesting doorway, and perhaps show that the work of the years 1170–92, although not at all suitable for modern reproduction, is at least worthy of careful study and complete mastery; one may go further and say that without a good knowledge of Transitional features it is extremely difficult to properly grasp the beauty of the style to which it led. If it be possible in these times to produce work approaching the technical excellence of the Early English style, surely one way to make it a living and attainable idea is to give a discriminating study to the sources from which that period derived its first inspiration. The course of Transitional art is both interesting and valuable—interesting, as showing the gradual awakening of a great factor in architectural design; and valuable, as from its failings the modern worker may avoid the pitfalls of the ancient architect, who felt the power of the new style but fell short of the perfect in the expression of his ideas. It is to the application of the Transitional artists that we owe the successful issue of the "battle of the styles" in such buildings as Lincoln and Wells, and countless other churches enshrining some gem of Early English art which is too often but little appreciated by those to whom the stewardship is entrusted.

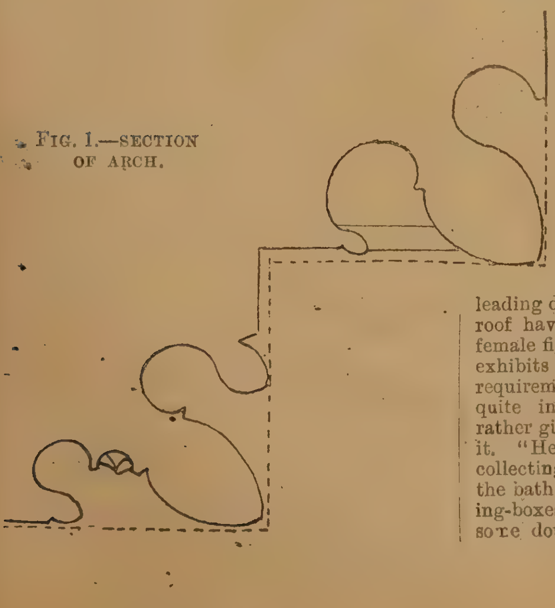


FIG. 1.—SECTION OF ARCH.

R.I.B.A. PRIZE DRAWINGS.

THE drawings submitted for the several studentship prizes of the Royal Institute of British Architects are on exhibition till January 25th at the Alpine Club (entrance in Mill Street, Conduit Street, W.). A very excellent subject was set for the Soane Medallion and £100—that of a swimming bath for men in a seaside town. It is most desirable in competitions of this nature that the students should be required to exercise their talents on something which is likely to come within their sphere as practising architects, and this year the subject chosen is eminently satisfactory in this particular. Sixteen sets of designs have been sent in, and they show a vast range of treatment, from the ordinary pitch-pine and iron tie-rod order to sculptured halls of Roman magnificence: which is the result of the cost of the structure being unstated in the conditions. There is not one design which fulfils all requirements, but several of them exhibit points of interest. "Roma," for example, has carefully considered details in regard to the bath being covered over in the winter and used as a place for concerts or other entertainments; and his provision of a covered shelter at one side of the building leading to the gallery stairs is most commendable, as the usual access to the gallery is very inconveniently arranged. This design is conceived in a sumptuous style, marble columns, mosaic and tiles being used generously, and on the whole the effect of the interior is good. "Iona" is another praiseworthy design, but the plan is much more elaborate, comprising, amongst other accommodation, the full equipment for Turkish baths and slipper baths, as well as a salt-water bath and a gymnasium at the back of the swimming bath proper. This design is even more elaborate than the last, the extensive carving and statuary in the interior recalling very strongly the old Italian masters: the drawing itself is excellent. "Zeno" shows a totally different treatment, being much less costly to execute. The building is of red brick and the girders are carried boldly across the inside, the gallery front being embellished with ceramic panels that remind one of Pompeii; the effect of the whole is, however, cold and uninteresting, though the plan has the excellent feature of a passage behind the dressing-boxes to prevent people walking in boots along the side of the bath. The design by "Phœnix" has an apsidal termination enclosing hot-water fountains (though for what purpose is not obvious); "Amphibious" is distinctly Venetian, four steps leading down to the bath edge all round and the roof having corbels or brackets in the form of female figures about to dive into the bath—which exhibits ingenuity, but does not satisfy æsthetic requirements, as the figures in that position are quite incapable of supporting the roof, and rather give the impression of being supported by it. "Hero" employs the inconvenient device of collecting all his dressing-boxes at one side of the bath; "Io" is very generous with his dressing-boxes, providing about eighty; "Nero" has some double columns which, though doubtless imposing, quite preclude the persons sitting in the gallery between them from seeing more than a quarter of the bath-space at one time; "Wyvenhoe" covers his bath with a great lattice-girdered roof, which is well devised, while at intervals along the bath sides are figures holding lights in their hands (it is desirable to call attention to this feature, as the artificial lighting of the bath is apparently forgotten by most competitors). Of the remaining designs none call for special mention. A feature which has proved a Gordian knot to all is the chimney stack. "Roma" has done as well as any in making a water-tower of it, with the stack at one side, but this tower looks very stunted. We think it would have been better if a limit to the cost had been stipulated, which would have prevented so large a difference in the accommodation provided by the various competitors; but, in any case, it is obvious that no seaside town would incur the expense of erecting several of the designs, and this fact should have been apparent to their authors.

The Tite Prize (certificate and £30 for travel in Italy) has attracted many students this year. The subject was, "A Royal Memorial Chapel in the Italian Style"; and twenty-four designs have been submitted. The plan consists of seven radiating chapels arranged around a central hexagonal space, and the similarity of the designs is remarkable. Each student—almost without exception—seems to have taken as his model—St. Paul's Cathedral. The result is that we have a generous duplication of Wren's dome and western front, but without its delicacies of proportion. One or two competitors are frankly Italian, and it is not difficult to name their models. This is much to be regretted, as the subject is one of wide scope. Even considering the object for which this prize was founded, it would have perhaps been better if the style had not been restricted to "Italian," and the student

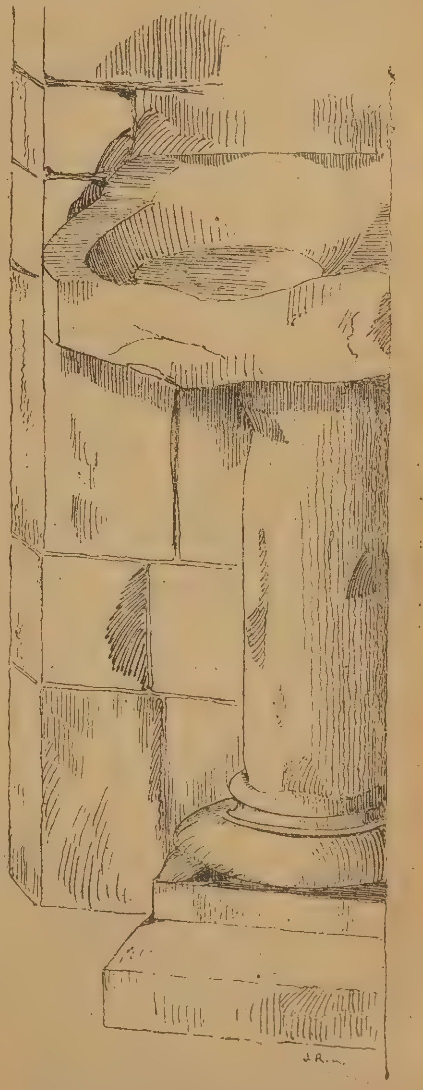


FIG. 3.—DETAIL OF SOUTH JAMB.

thus allowed to develop a creation of his own instead of merely producing copies in miniature of existing buildings.

Twelve sets of drawings for the Pugin Studentship (silver medal and £40 for travel in the United Kingdom) have been submitted, but on the whole they are not very good. Mr. C. Wontner Smith's drawings are, however, excellent, the colour-work being clean and sharp, and the rest exhibiting a painstaking and very firm hand.

The subject set for the Grissell Prize (gold medal and £10 10s.) was, "a roof, in iron, concrete and glass, of a picture gallery." The few designs submitted call for no special mention; nor do the two sets of drawings submitted for the Godwin Bursary (silver medal and £40 for travel outside the United Kingdom) or the twelve sets of measured drawings sent in for the Institute Silver Medal and £10 10s. Many careful drawings are sent in for the Owen Jones Studentship (certificate and £100 for travel and study of colour). Amongst the drawings exhibited are those by Mr. George A. Paterson (Owen Jones Student, 1900), Mr. Henry W. Cotman (Pugin Student, 1901), and Mr. Sidney K. Greenslade (Godwin Bursar, 1900).

Views & Reviews.

Water-Supply.

Dr. Thresh has produced a very valuable work on the important subject of water and water-supplies, and its usefulness can be gauged from the fact that the present is the third edition. To the medical officer of health it is invaluable, but to the water engineer and architect only so far as it deals with the composition, analysis, purification and selection of water, and the law relating thereto; but the information afforded upon the construction of wells, reservoirs, &c., planning of buildings and the laying-out of distribution schemes, pumps and pumping machinery, and such constructive parts of water-supply schemes, is of the most meagre sort. The illustrations are very few and useless. These defects should be remedied, as there is need for a good constructive work on the subject. Of course, water-works engineering is not in Dr. Thresh's line, but he should secure the co-operation of a qualified engineer; the want of this detracts from an otherwise excellent book.

"Water and Water Supplies," by John C. Thresh, D.Sc., M.D., D.P.H., F.I.C., &c. London: Rebman, Ltd., 129, Shaftesbury Avenue, W.C. Price 7s. 6d. nett.

The Chemistry of Painting Materials.

The third edition of Professor Church's book has been thoroughly revised and enlarged, and should be in the hands of every colourist. Of course the book is almost a necessity to any oil painter of pretensions, but it is also of great value to the architectural draughtsman and water-colourist. The book is divided into chapters on painting grounds, vehicles and varnishes, pigments and "methods and results." Mr. Church, as Professor of Chemistry in the Royal Academy, has had exceptional opportunities for studying his subject for many years. If there is one criticism to make on the book it is that a chapter dealing with the principles of colour-mixing and testing should be included. The analyses of drawing-papers on p. 9 are too old to be of value.

"The Chemistry of Paints and Painting," by A. H. Church, F.R.S., M.A., D.Sc., F.S.A. Third Edition, revised and enlarged. London: Seeley & Co., Ltd., 38, Great Russell Street.

Guy's Hospital is being renovated and added to. A new nurses' home is nearly finished. It will be the largest and most complete building of the kind in the country, and will contain 210 bedrooms, reading- and dining-rooms, and a swimming bath. A laundry is also being provided, though much of the cost has yet to be defrayed. The lighting and heating systems of the hospital are being reconstructed. The casualty department will be extended and renovated. The system of open-air balconies into which patients from the wards can be wheeled in fine weather, so that they may enjoy the fresh air and the sunshine, will be extended, and sanitary blocks for the surgical wards provided. The improvements will cost £180,000.

ARCHITECTURAL ASSOCIATION.

ARCHITECTURAL AND CONSTRUCTIONAL ENGINEERING.

BY T. C. CUNNINGTON.

A MEETING of the Architectural Association was held on Friday evening last at 9, Conduit Street, W., the chair being occupied by the president, Mr. Howard Seth-Smith. After the minutes of the last meeting had been read and confirmed, the following were elected members of the Association:—E. J. Harbottle, R. Herbert, J. R. Hobson, L. de B. Kilsey, E. P. Lee, A. G. MacNaughtan, H. A. Porter and W. S. Read. The president announced the following additional donations to the New Premises Fund:—

	£	s.	d.
Robert L. Curtis - - - - -	105	0	0
R. A. Briggs - - - - -	12	12	0
John Leaning - - - - -	10	10	0
H. J. Leaning - - - - -	5	5	0
H. Passmore - - - - -	5	5	0
E. Boehmer - - - - -	2	2	0
M. F. W. Bunney - - - -	2	2	0
Guy M. Nicholson - - - -	2	2	0
C. E. Simmons - - - - -	2	2	0
C. M. C. Armstrong - - - -	1	1	0
D. Stewart - - - - -	1	1	0
G. H Smith - - - - -	1	1	0
P. Rider Smith - - - - -	1	1	0
F. J. Potter - - - - -	1	1	0
W. B. Dukes - - - - -	1	1	0
	153	6	0
Donations previously announced	3,436	12	0
Total - - -	£3,589	18	0

It was announced that the First Spring Visit would take place on February 1st at 2.30 p.m. to Christ Church, Brixton Road (near Kennington Park), by kind permission of Prof. Beresford Pite. Mr. T. C. Cunnington then read a paper on "Architectural and Constructional Engineering." He said:—

In the first place I propose to deal with American tall structures, and then give some examples of roofs executed to fulfil specific requirements.

With all the ingenuity and the economy of time and money incident to its application, it must be admitted that the so-called Chicago raft foundation cannot be recommended for use upon compressible soil, by reason of its liability to serious disturbance by future underground works in adjacent or neighbouring streets; but that the footings should be carried through the compressible strata to the underlying rock, and for this purpose timber piling cannot be trusted as affording a guarantee of safety for many years, unless there is absolute certainty of maintenance of water-level in the underlying soil. This will, in many cases, make concrete piles, or caissons containing masonry or concrete piers, the only scheme of foundation construction which warrants the permanence of the supports of the structure.

The first building I propose to describe will be

The Park Row Building, New York,

Mr. R. H. Robertson being the architect and Mr. Nathaniel Roberts the engineer, the latter being responsible for the whole of the structural steelwork. The building is twenty-six storeys high in the middle part, while the two towers are each four storeys higher, making in all thirty storeys. The total height from the kerb to the top of the cupolas is 386ft. The structure is carried entirely on piles driven into a sand foundation to a depth of about 20ft. There are about 3,500 piles used in the construction. They are of *round American spruce* (free from knots, with the bark left on). They are from 10in. to 14in. in diameter at the head, and the load on each does not exceed 16 tons. They are driven at from 16in. to 18in. apart, centre to centre, commencing at the centre of each group and working outwards, while the rows are about 24in. apart, centre to centre. The heads are cut off below the level of ground-water, or at 34ft. 4in. below the level of the kerb in Park Row. From 12in. to 16in. is excavated out around the head of each pile, which space is filled in with concrete composed of 1 part Portland cement, 2 parts sand, and 5 parts broken stone of not more than 2½in. cube. The concrete is levelled up flush with the heads of the piles. Upon the top of the concrete are laid granite blocks to receive the brick piers which carry the grillage beams to be described later.

The column loads carried by the foundations of this building are very high, some of them exceptionally so. It was, therefore, necessary to distribute the pressure on the grillage beams as evenly as possible. The need for great care in this matter will be evident when I say that the weight of the steelwork alone is 9,000 tons, while Mr. Roberts estimates that the weight of the building is 56,200 tons, or a total of 65,200 tons.

Most of the columns rest on distributing girders, each girder carrying, as a rule, two

HENLEY TOWN HALL. HENRY T. HARE, F.R.I.B.A., ARCHITECT. W. LINDSAY AND CO., ENGINEERS. (*Photo: S. B. Bolas & Co.*)

columns, though in one case there are as many as four columns on one girder. The interior columns have no distributing girders, but rest directly on the grillage beams, and have each an independent foundation. Each foundation was separately designed for the load it had to carry, and the sizes of the girders and the grillage beams vary accordingly.

(A typical distributing girder was here described by the lecturer. This girder supports columns each of which carries about 1,100 tons, so that the girder itself sustains a load of about 2,200 tons. It is 26ft. long and 8ft. deep, and has four web plates, each ⅝in. thick. There are four angles, 6in. by 6in. by ⅞in., in each flange, together with three plates, each 2ft. 8in. wide by ¾in. thick. The girder is carried on thirty-five joist beams 12in. deep and 5ft. long, which are separated by distance-pieces. In the foundation in question there are four of these distance-pieces between every two beams, but in some of the foundations, where the length of the beam is 6ft., there are six distance-pieces between every two beams. The distance-pieces are box-shaped, and have milled surfaces which bear evenly on the top and bottom flange of the beams. The grillage beams rest on the top of the granite caps, and are bedded on cement. The largest distributing girder is that carrying the four columns facing Theatre Alley. It carries a load of about 2,930 tons, and weighs 47 tons. In the manufacture of all the distributing girders it was particularly specified that the vertical angle-iron stiffeners should have a good bearing against the top and bottom flanges.)

The floor beams are generally composed of the joist-beams bolted together with ¾-in. bolts, and have cast-iron distance-pieces between them. There are three or four distance-pieces to each span, and they are so made that the flanges of the joist beams will not be less than 1½in. apart. The beams which carry the fireproof flooring are all tied together with ¾in. bolts to take the thrust of the flat arches. The floor beams are framed so that the bottom presents two different levels, one 5in. above the other. In the area, where 15-in. beams are used, the beams and girders are framed flush, the 10in. and 12in. beams being framed flush at the bottom, which is 5in. above the bottom of the 15in. beams.

Box and lattice girders are used for connecting the columns at the walls, and they are attached to the columns in such a way as to make the connections as stiff as possible, in order that it may do service as vertical wind-bracing.

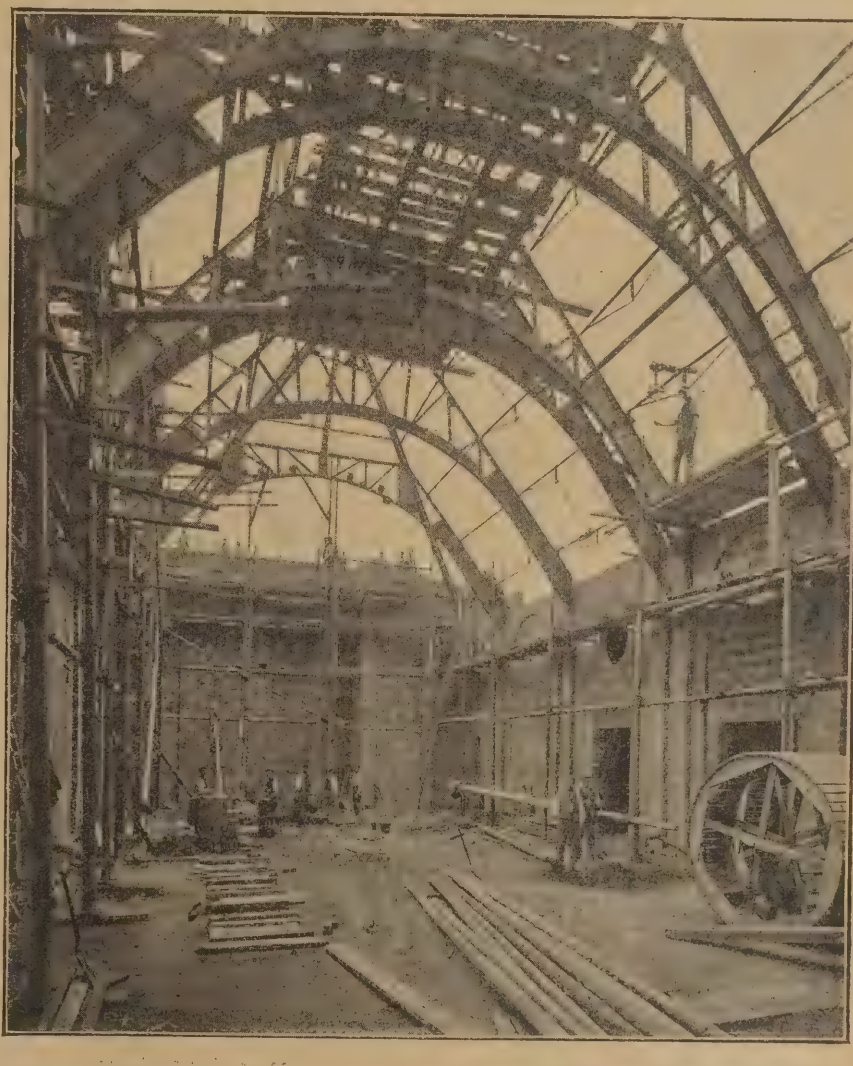
The bottom length of each of the main columns, where it rests on the distributing girder, has a flange plate at right angles to its axis, which plate is securely riveted to the body of the column with angles by means of a double line of rivets, while at its upper end, where the next column length rests, it has angles forming a flange, but no plate. The ends of the two lengths of columns are faced so as to bear very truly one on the other, and are riveted together through each angle. In addition to this there are two splice plates, one on each side of the column. These plates are firmly riveted to the lower length in the shops, but the part projecting above the top is riveted to the next length of column above when they are erected on the site of the building. These rivets pass through the splice plates and the sides of the column. This forms a very strong joint, and is preferable to the method of fixing by means of angles alone, as it makes the whole column much stiffer and better able to resist the side stresses due to wind.

All the columns in the walls are carried up 3ft. above the roof beam, and are there connected with a line of 8in. channel under the coping.

The Montgomery Ward & Co.'s Building

at Madison Street and Michigan Avenue, in the heart of the Chicago business district, was next described by the lecturer.

The concrete foundation piers are set on steel grillages on about 1,200 15in. piles. These are 52ft. long, driven to 68ft. below grade, and are calculated for maximum loads of 25 tons each. The steel columns are of closed rectangular cross-section, made up of pairs of channels and flange cover-plates, the largest having an area of about 180 sq. in. of steel. The tower is calculated for a wind-pressure of 30lbs. per sq. ft. on its vertical projections above the main roof, and the remainder of the building is calculated for the same wind-pressure on all exposed vertical surfaces of the two end bays of each elevation. The wind stresses parallel to Madison Street are assumed to be resisted by the rigidity of the walls, floors, and partitions, and by the strength of the beam and column connections. In the direction parallel to Mitchigan Avenue there is special wind-bracing, consisting of solid plate stiffened knee-braces at the top and bottom of each end of the wall girders, and of horizontal plate girders, 30in. deep, with 6in. by 4in. flange angles, at every storey between the corner column and the one adjacent to it. A similar construction on all sides of the tower is carried up to the twentieth storey, where the knee-brace brackets are replaced by longer and heavier knee-brace struts connecting the tops of the corner columns to the system of plate girders which forms a rigid horizontal framework supporting the overhanging twentieth floor.



COLCHESTER TOWN HALL. JOHN BELCHER, A.R.A., ARCHITECT. W. LINDSAY AND CO., ENGINEERS. (*Photo : S. B. Bolas & Co.*)

There are twelve outside columns and no interior ones in the tower.

Up to the eighteenth storey its floor framing consists of two 24in. transverse joist-beams supported on the two pairs of intermediate columns, and of seven longitudinal lines of 8in. joist-beams, which are supported by these girders, and by the pairs of 15in. wall-girder channels which connect the columns in four places by direct connection to the intermediate columns. A 9ft. by 10ft. panel in the middle of the floor has additional framing for the circular elevator shaft. At the eighteenth storey light channels, beams, and angles are bracketed out a short distance from the columns just above the floor line to carry a projecting terra-cotta belt-course.

After describing the electric tower of the Pan-American Exposition, the lecturer dealt with

Wind-bracing.

In arranging a building for wind-brace sections, sometimes the floor plans will permit a symmetrical arrangement of the cross-section in which the wind-bracing is to be put. Frequently, however, no such desirable arrangement is possible, and only certain sections can be utilised. This complicates matters somewhat, but careful study will usually permit a satisfactory solution of the problem.

Wind-bracing in a high building performs, during and after erection, the very practical office of facilitating erection by enabling the columns to be maintained in their correct vertical position. Wind-bracing can be made of certain lengths to fit between the columns, and requires that each column shall be in its proper place before the bracing will fit, so that no great error can accumulate.

A careful comparison of the treatment of wind forces as applied to tall buildings of to-day leads one to the conclusion that the designers differ very materially in regard to the forces to be resisted, the strength of material employed, and the most efficient details of construction.

A building constructed with a well-proportioned iron frame should be safe if provided with brick partitions, or if the base is a large proportion of or equal to the height, or if the exterior of the iron framework is covered with well-built masonry walls of sufficient thickness, for the rigidity of the solid walls would exceed that of a solid frame to such an extent that, were the building to sway sufficiently to bring the bracing into play, the walls would be damaged before the rods could be brought into action. Hence the stability must depend entirely either upon the masonry or on the iron framing, and in veneer buildings, which are being particularly considered, the latter system of bracing the metal work must be used, with the walls as light as possible, simply enclosing the building against climatic and injurious forces.

Wind-bracing must reach some solid connection at the ground. It should also be arranged in some symmetrical relation to the building outlines.

The shears are undoubtedly reduced to some considerable extent through many practical considerations, having regard to the dead weight of the structure itself; the resistance to lateral strains offered in the stiff lateral riveted connections between the floor system and the columns, the stiffening effects of partitions (if continuously and strongly built) and linings, coverings, &c., all tend to decrease the distorting effects of the wind-pressure.

Take a typical skeleton building fourteen storeys high, 12ft. each, 24ft. front, and columns spaced 12ft. apart in the depth of the building.

Assuming that stiffness against side yielding alone is necessary, and utilising floor girders as struts with the columns as chords, at 30lbs. per sq. ft. wind-pressure the panel load equals 4,300lbs.; considering the protection afforded by neighbouring buildings, the point of application of the resultant wind-pressure will be taken at say two-thirds of the height of the structure above ground. The total shear will then equal about 60,000 lbs. or 30 tons.

The dead weight, including iron walls, floors, filling, &c., will equal about 250 tons for one foundation, while even for a building with no filling or partitions completed, the dead weight is still some 200 tons, thus rendering anchorage unnecessary.

Exterior Walls—Piers.

The weight of the walls is capable of at least three separate treatments, each suited to its own peculiar circumstances:

1. Where the outside piers are constructed entirely of masonry carrying all of the wall, floor and roof loads which come upon them, by means of masonry alone. Such construction is used in buildings of moderate heights, and constitutes the ordinary type of building.

The objections to such piers of solid masonry are threefold, where structures are higher than, say, sixteen storeys, viz.:—

(*a*) The modern requirements of plenty of light and air in all offices demand that the windows be broad and numerous and the piers narrow.

In the highest buildings of the present day hardly any masonry construction is strong enough to carry the necessary roof and floor loads besides its own weight for so great a height and with so small a cross-section as is desired.

(*b*) The second objection to such large masonry piers is that they take up too much valuable renting space, and where the rent of offices is proportioned at per sq. ft. this becomes a matter of no inconsiderable importance to the owner. Also, the weight of these solid masonry piers would so add to the load per sq. ft. that many of the most remarkable examples of architectural engineering would be well nigh impossible.

2. The second treatment is that in which metal columns carrying the tributory floor and roof loads are placed inside the masonry piers, while the latter support themselves and the "spandrels" only. The spandrels constitute those portions of the exterior walls lying between the piers and over and under the window spaces.

3. The third method of constructing the exterior piers is the one more approved at the present stage of architectural engineering, the one which has undoubtedly opened up the means for building the highest structures. In this all the weights are thrown on the metal columns, which, in place of solid piers, are surrounded with a protective shell or covering only, made of ornamental terra-cotta or brickwork securely anchored to and supported by the columns at the various floor levels.

Roofs.

The Buffalo Savings Bank occupies a rectangle of about 75ft. by 69ft., with a triangular extension 56ft. long on one side. The building consists of a two-storey main rectangular part, about 130ft. high, and a three-storey wing, about 50ft. high, on the triangular extension of the plot. The banking-room, 65ft. high, is surmounted by a domed ceiling supported on an octagonal steel framework. Above the dome there is a steel platform supporting an octagonal office storey, 11ft. high and 70ft. wide, which is surmounted by a domed roof 53ft. 6in. in diameter, and 33ft. high above the horizontal ceiling.

In the New York Clearing House the dome has a nearly hemispherical exterior surface, and is supported by an octagonal arrangement of web-connected plate girders. It rests on each of these girders, and intermediately on 20in. rolled beams across their angles, which form with them a sixteen-sided polygon. The girders are supported on the tops of the columns at the angles of the octagon except on one side. Here the 16ft. side of the octagon is the middle part of a 47ft. riveted truss, which carries the ends of the adjacent girders, and is supported on special columns. This truss has a double-triangular web system, with all connections riveted. The tension diagonals are flat plates; the bottom-chord web-plates are 18in. deep, and the fourth-storey floor-beams are connected to the webs.

The vertical end members of the truss are practically continuations of the columns that support it. These columns are spliced at every storey with four web-plates. The bottom of the lower section has eight vertical connecting angles riveted to the vertical web stiffener-plates of the extended base, the base being 5½ft. square, with eight vertical web stiffener-plates and four knee-brace angles on the main diagonals to stiffen the corners. Other columns have bases 3½ft. square, which are similar to these, except that the knee-brace angles are omitted. There are sixteen radial dome trusses.

Colchester Town Hall Roof.

The roof over the Moot Hall, about 100ft. by 40ft., is constructed with seven principals, the ends of the roof being hipped. The high pitch and the conditions to be complied with necessitated nominally two different systems of trussing. There are two pairs of principals placed 3ft. 1½in. centres. This method was adopted to carry the fire and ventilating flues from the lower storeys to the chimney-stacks that are placed on the front slope and near the ridge line, the flue pipes in same being embedded and surrounded in concrete. Seating angles and connecting plates are riveted on the intrados of the principals to receive the wood purlins or framework for the barrel-vaulted ceiling. The principals are made of double angles 4in. by 3in. by ⅜in., and ⅜in. web plates in the lower part or legs, well stiffened and riveted together. The hip rafters are also made of plates and double angles, so as to receive the purlins and other framing. These principals bear upon the front wall masonry and in the opposite wall upon specially-built steel stanchions, to which they are riveted. These stanchions stand upon steel plate girders at the floor level of the Hall, the girders being supported by compound stanchions made up of joist and plates, and extend to below the lower basement floor level. The purlins are 3½in. by 3½in. by ⅜in. angles, and trussed, to which are bolted the wood purlins that receive the roof boarding.

Henley Town Hall Roof.

Henley Town Hall roof is constructed with six steel principals, Mansard-shaped outside or extrados, and semi-circular on intrados. Each principal was made in three sections for convenience of transit (the span being 40ft.). They are bolted on the radial line at the junction where the sloping roof meets the horizontal. They are made of tees, angles, bars, and plates riveted together. Angle seatings and cleats are provided on the intrados to receive the purlins or the principals of the framing.

The Discussion.

The president read letters from Mr. A. T. Walmisley, Mr. Macvicar Anderson and Mr. Riley regretting their inability to attend the meeting. Mr. Walmisley remarked that he thought there were many structures where the engineer might profitably engage the services of an architect for the artistic portions and general arrangements of interiors as well as elevations, but that the structural parts to be designed by the engineer should in every case claim the precedence and dictate the outline of design. He cited the arch of Westminster Bridge. An engineer knew that no diagram of stresses in ironwork gave the curve here adopted. He also cited the iron parapet of the Victoria Railway Bridge across the Thames at Battersea, which was admired by engineers because it was a design that could not be made in masonry.

A letter was read from Mr. Lewis Solomon, F.R.I.B.A., in the course of which he referred to iron domes. These the paper led him to believe were almost a new feature, but that was not so, as he remembered that more than thirty years ago, when he was connected with the construction of the Ottoman Bank in Throgmorton Street, that there was an iron dome to the Board room, the ironwork of which was, he believed, made by Mr. Homan (now of the firm of Homan & Rodgers), but the architectural work was in no way done by the engineer.

The following notes by Mr. W. E. Riley, superintending architect to the London County Council, were read to the meeting:—

Looking recently at some views of Lower New York they seemed quite unfamiliar to me although I was there frequently up to thirteen years ago. The erection of numerous high buildings has brought about this great change. In these buildings the steel columns are the only portions of the structure which are carried to the foundations, and they provide the reactionary forces of the weight of the building; each storey being carried independently of the one above or below it. The cubical contents of some of the high buildings in New York must necessarily be very considerable, especially in comparison with London buildings, where, as is well known, special permission is necessary to allow buildings of the warehouse class of a greater cubical extent than 250,000 cub. ft., in which cases the buildings must not exceed 60ft. in height, nor be of a maximum capacity of more than 450,000 cub. ft. But it must be borne in mind that American cities have been laid out on modern lines with the special advantage of enjoying a maximum of sunshine, whereas in London the limited amount of sunshine must be regarded as a factor in considering the height of buildings in relation to its open spaces. The newest building code of New York City, which came into operation in October, 1900, provides that any hotel, lodging-house, school, theatre, gaol, hospital, &c. which exceeds 35ft. in height shall be built fireproof, and every other building which exceeds 37ft. in height shall be similarly constructed. Mr. Riley referred to the fires at the Home Life Building and the Windsor Hotel, and said in conclusion that if the tall building was not all that could be desired, it was another effort to solve a difficulty, and as experience was gained it might ultimately lead to some satisfactory result in America; but it did not seem a suitable form of structure for this part of the world.

Mr. Thomas Blashill said he did not think it at all likely that tall buildings like those in America would be erected in this country, but there was much to be learnt from them, especially from the methods adopted for joining the details. Students should study ironwork construction more. The separate action of engineer and architect, neither of whom had much sympathy with the other, was not what should be desired. In concluding he referred to the action now being taken by the various engineering bodies for the standardizing of steel sections, which would prove of great value both to engineers and architects.

Mr. Max Clarke put several constructural questions to the lecturer with regard to the foundations. Mr. Richard Moreland, junr., A.M.I.C.E., then observed that he thought it would have been better to have used steel instead of granite blocks in the foundations. In London there were several large buildings which were floated on bad foundations in this way—the Harmsworth building, for example, where the load was calculated at 2 tons per sq. ft.; and also the Carlton Hotel block. At the former building, where all the basement space was required for the printing machines, solid steel columns had been used in place of hollow steel columns or riveted stanchions, both of which would have needed to be much larger in section He thought that the nearest approach to an American building in London was that of Messrs. Nicholsons, at the corner of St. Paul's Churchyard. Nobody would call it a beautiful building, but it was interesting as having no brickwork up to the second-floor level, all being carried on steel columns and the wall above cantilevered over. Architects were constantly wanting shallow girders. One-twentieth or one-twenty-fourth of the span was the usual practice, but if this limit was exceeded the greater stress should be allowed for.

Mr. H. H. Statham said he should respect the American architects more if they built more truthfully, leaving their steel structures uncovered by false veneers. The president remarked that when one considered the enormous rise in ground values, the increasing spans in domes, arches, &c., the precautions against the spread of fire, and other matters—these seemed to dictate some kind of development on the lines adopted in America; and he suggested that a compromise might perhaps be arrived at to suit the needs for large buildings on small areas. Mr. Cunnington replied, and the meeting then terminated.

Law Cases.

Electric Street Inspection-Boxes.—At the Guildhall Police Court last week the Charing Cross and Strand Electricity Supply Corporation, Ltd., was summoned by Mr. Edmund Woodthorpe, district surveyor for the northern division of the City of London, for beginning certain works without having served a notice upon him. Alderman Crosby, in giving his decision, said the work was an electric street inspection-box, and he found that the Company had not given notice in accordance with section 145 of the Building Act. He held that this was a building, structure or work within the meaning of that Act, and fined the company £2 and £2 2s. costs. Defendant's counsel asked the Court to state a special case, but the Alderman refused to do so.

Recovering Cost of Repairing Highway.—On January 12th, in the King's Bench Division of the High Court of Justice, judgment was given in the case of the *Urban District Council of Esher and the Dittons* v *Marks.* The action was brought to recover £137 10s. 5d., being the necessary expenses incurred by the plaintiffs in the repair of a certain highway known as Ember Lane, leading from Bridge Road, Thames Ditton, westward to the bank of the River Ember, which highway the plaintiffs alleged that the defendant was liable to repair *ratione tenuræ* and had failed to repair after due request, pursuant to the provisions of the Local Government Act, 1894, section 25, sub-section 2. It was contended on behalf of the defendant that a liability to repair a highway *ratione tenuræ* can exist by prescription only, and therefore that where the road in question can be shown to have been first made within the period of legal memory there can be no such liability; and that as Ember Lane did not exist as a road before the year 1773 the defendant could not be liable to repair it *ratione tenuræ.* Judgment was, however, given for the plaintiffs.

Damage by Lightning: An Arbitration Case.—An enquiry was held at Chatham on January 10th by Mr. Alfred Hands, F.R.Met.Soc., in reference to a claim by the Churchwardens of Holy Trinity Church, New Brompton, against the insurance company for damage alleged to have been caused to the spire of that church by lightning on some date unknown. Some stones having fallen in July last, an examination was made, and cracks being found of such a nature as to render immediate repairs necessary, the work was carried out and compensation was claimed under the fire policy, which, as usual, contained a clause including lightning risks. The company having disputed the claim, Mr. Hands was appointed arbitrator, and after hearing expert evidence on both sides and examining the broken stones which had been preserved for the purpose of the enquiry, decided that the damage was not caused by lightning, but was due entirely to the rusting of the vane rod which passed through the stones, and, therefore, that the insurance company was not liable.

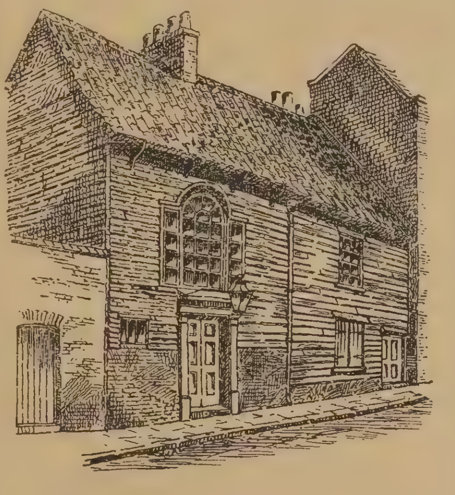
Bricks and Mortar.

APHORISM FOR THE WEEK.

Art excites enthusiasm and the critical faculty, the senses and the reason.—GUIZOT.

Our Plates. THE design for a town hall for a London borough by Mr. F. Winton Newman was the most monumental one sent in for the Royal Academy Gold Medal and Travelling Studentship in Architecture. The author decided that the town hall should to some extent dominate the whole design. The site he imagined to be on the borders of one of the London parks, and in working out the design he kept these points in view. The hall—with entrances, cloak-rooms, &c., is arranged on the ground floor, separate from the municipal portion of the building, so that it could be used without disturbing the working of the council-chamber or municipal offices. The latter are arranged on the ground- and second-floors, with additional rooms in the basement, the whole of the first floor being used solely for council-chamber, committee-rooms, mayor's room, &c. Access to the public gallery of council-chamber is by means of the staircase next to the rates office.—The house by Mr. Elmer Grey is a most admirable piece of simple design by this well-known American architect, and we publish it in pursuance of our policy of illustrating the best modern work on the other side of the Atlantic.

"Bunyan's Chapel." HALF-WAY down Great Suffolk Street, which is in the Borough, are two little courts of very little houses which are called King's Court and Queen's Court.



"BUNYAN'S CHAPEL," BOROUGH, S.E.

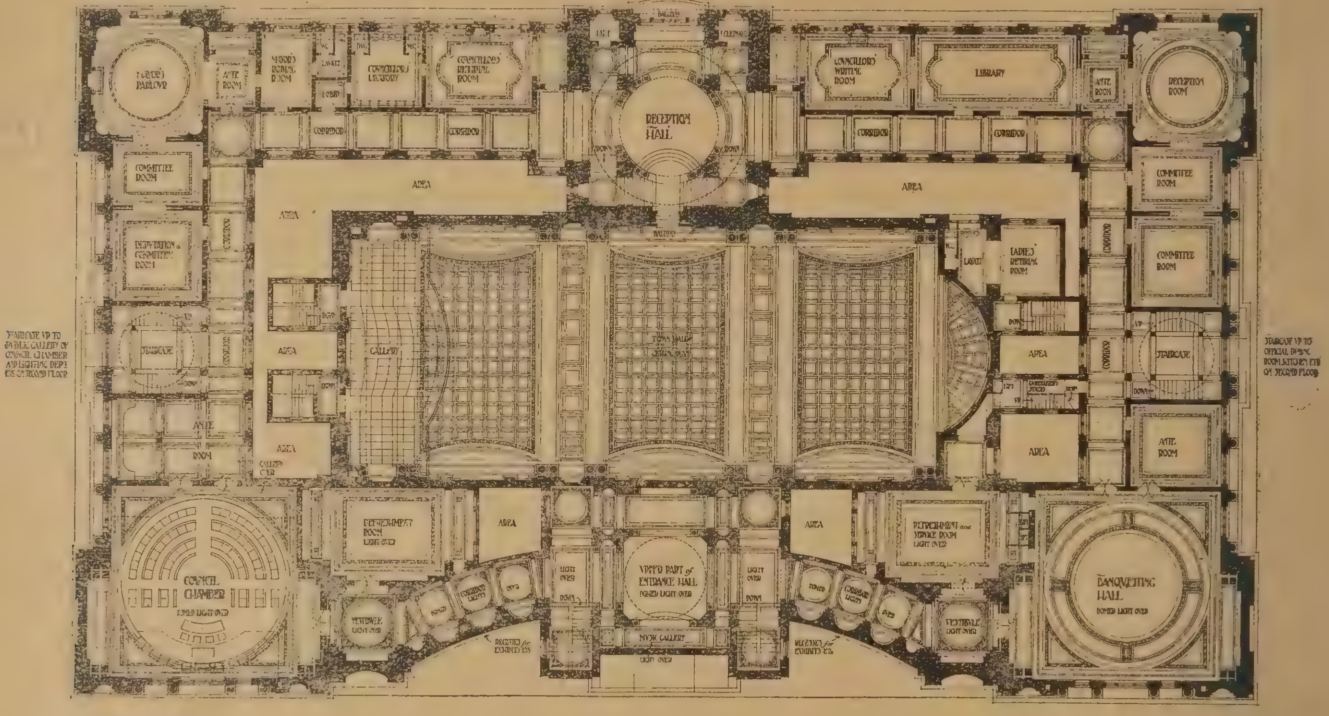
King's Court, like the Marshalsea, is to make way for modern improvements; and the most interesting monument in its narrow boundaries will shortly be pulled down. The monument is an odd little building, half wood and half red tiles, and both tumbling down, which is known as Bunyan's Chapel. Within, Bunyan's Chapel shows fewer symptoms of decay. The wooden galleries are there, as they have been for more than two hundred years, and the beams and rafters are sturdy. In its pulpit tradition alleges that Bunyan preached during the twelve years of his imprisonment at Bedford; and in a curious secret chamber between the garrets of the adjoining house he is said to have concealed himself from his pursuers. On the other hand, the Baptists state that early in the eighteenth century the Baptist congregation of Southwark were accustomed to assemble in an old meeting-house in what was then Duke Street, and now forms the western half of Union Street. About 1773 this congregation was divided in itself on the question of Calvinism. One-half migrated to Zoar Street, and the rest established themselves in what is now known as "Bunyan's Chapel," in King's Court, opposite Bridewell, then "a kind of assembly, or club-room, originally belonging to a public-house." It was "fitted up as a place of worship" and opened in 1800 by the "General Baptist Society." It held about 150 persons, and was latterly used as a mission hall. The accompanying drawing is by Mr. H. J. Palmer.

The R. L. S. Memorial. THE committee of the Robert Louis Stevenson Memorial has issued a statement explanatory of the delay which has occurred in bringing matters to completion. The sum likely to be available for the purposes of the memorial was not of a sufficient amount to warrant any attempt to erect an open-air memorial, so permission was sought from the Board of St. Giles High Kirk, Edinburgh — the Scottish national Valhalla—for the erection of a mural monument within its walls. The work was entrusted to Mr. Augustus Saint Gaudens, "the only sculptor of note who had studied Mr. Stevenson from the life," who visited Edinburgh in January, 1899, for the purpose of studying the proposed site for the memorial. In May, 1899, his design was submitted to the executive and to the St. Giles Board, and was approved. In December, 1899, Mr. Saint Gaudens submitted a revised design, which was approved. He then decided to revert to his original design. His model was just about to be cast in bronze when, in July, 1900, Mr. Saint Gaudens became dangerously ill, and had to leave Paris for the United States, where he has since undergone several serious surgical operations. The marble framework was received in Edinburgh last May. But in June Mr. Saint Gaudens wrote to say that he was so anxious that the patine (a surface colouring obtained by chemical treatment and firing) should be to his satisfaction that he had ordered the bronze cast to be forwarded to him in America for inspection, as he had found it impossible to come to Europe that year. At the end of November he had just ascertained that the patine did not satisfy him, and the completed bas-relief suggested to him the desirability of modifications which would improve its appearance. For these reasons he is remodelling the design, and intends to have a fresh cast made. This alteration will postpone the completion of the memorial until the spring.

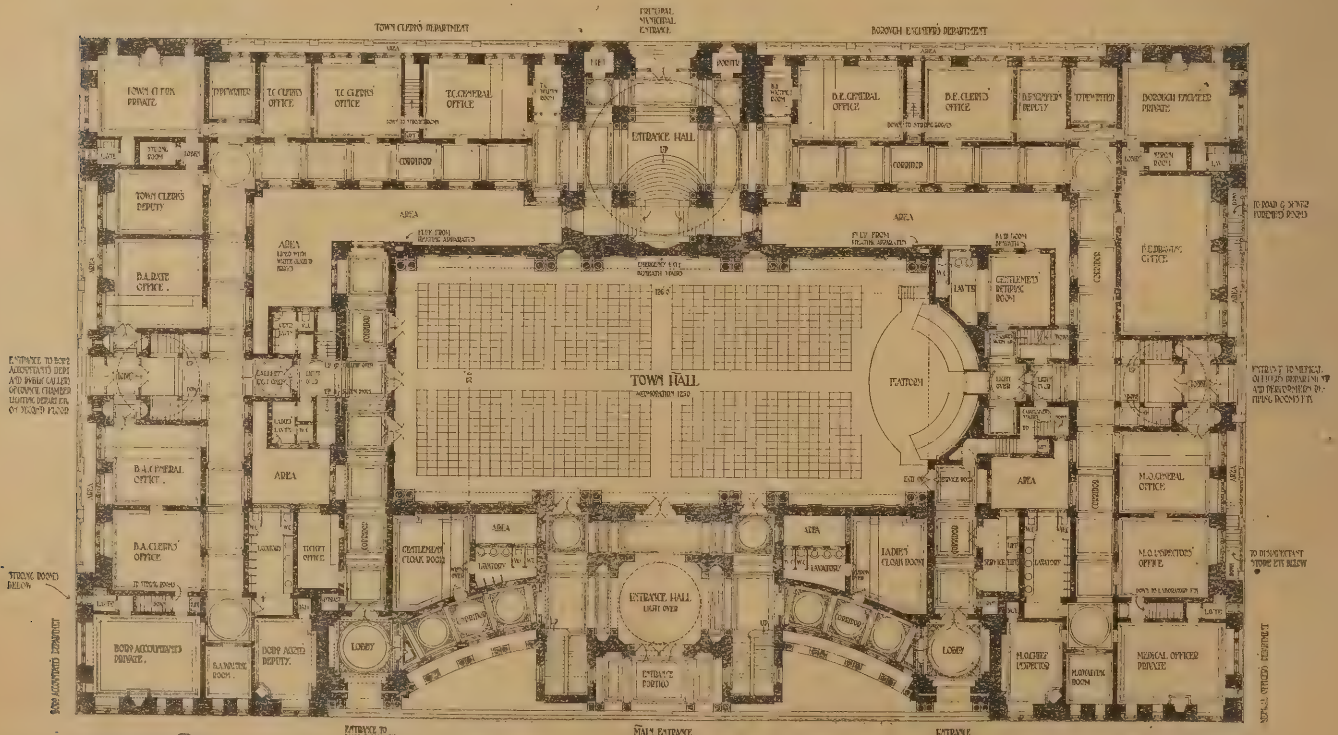
Art Industries of Florence. MR. PERCY CHAPMAN, British Consul-General in Florence, has lately prepared a report on the industries of the province of Florence. The art industries are of great variety. Thus, amongst the quarries are those of the *Verde di Prato*, or serpentine, which stone is used for ornamental purposes, for the repairs to the cathedral and city churches, and to some extent for vases, statuettes and similar ornaments. The working of the precious metals is of considerable importance, especially in the city of Florence. The Florentine goldbeaters enjoy a high reputation in the world because of the purity of their gold and the regularity and thinness of the leaf. In porcelain the Ginori factory, not far from Florence, is the chief. It was established in 1735 by the Marchese Carlo Ginori—that is, about the same time as the Sèvres works, and about twenty-five years after the Dresden works at Meissen. The Ginori factory limits itself to the production of objects of real artistic value, disdaining bad imitations and the article known in the trade as *camelote.* The Cantagalli factory is renowned for artistic majolica, especially for imitations from the antique, plaques for inscriptions, Della Robbia work, and the like; and there are two other factories engaged in the production of similar art work. Artistic furniture was a decaying art in Florence ever since the thirteenth century, but in 1845 it was revived by several excellent artists. The Florentine mosaic industry, which was once a speciality of the city that enjoyed a world-wide renown, is now greatly affected by the competition of inferior mosaics in softer stones, as well as by fashion. The working of ornamental stones, especially marble and alabaster, holds a considerable place amongst the industries of the province. This industry, like that in mosaics, is almost exclusively supported by the British and American demand.

Brechin Cathedral Restoration. THE restoration of Brechin Cathedral may now be regarded as an accomplished fact. It has several times suffered restoration, and the vandals do not belong to past centuries, for even as recently as 1805-1807 ideas of restoration and improvement appear to have been crude as to suggest the destructive tendencies of the art-despising irreverency of the Reformation. Arches were dislodged, capitals and pillars and corbels put out of shape. The outer walls were carried up as if for the utilitarian needs of a factory! A flat plaster ceiling shut out the glory of arched outline above; and as for a chancel, it was built almost out of existence. The object of the recent scheme was, "while conserving what still exists of the ancient fabric, to bring back by a judicious restoration as much as possible of its pristine beauty," and Messrs. John Honeyman, R.S.A., & Keppie are the architects for the restoration. As soon as the architects had started on their work they received various surprises. When the plaster ceiling was taken away it was found that the clearstory remained uninjured. Stone coffins were disclosed, and, greatest of all, there were found the foundations of what had evidently formed a Norman building on the site of the present cathedral. The variety of style has long been a puzzle to the archæologists. The chancel, however, had suffered least from the ruthless destruction of Time and vandal. It was a very beautiful and delicate piece of work of Early English work, and the fragment that remained has enabled the architect to continue the design through the restored part. The chancel is a thirteenth-century one, coeval, of course, with the building of the cathedral. The composition of the windows is repeated; the roof is of oak, embellished with carving, and the stone used is the very same as that of the original construction. A new porch has been placed at the principal entrance on the north side. Doors for egress are provided, one from the new north aisle and one from the south transept, in addition to the great western door, which has been left intact. As there was little left to guide the architect in the restoration of the aisles, this involved a fresh design. The outside walls have been brought down to their proper height and roofed over, and the result brings into relief the famous round tower. An organ case of ornate design, made of Karri pine, has been restored at a cost of £135. In the chancel there are no less than fourteen memorial windows. The communion table, made of fine oak, and the pulpit, were the gift of the Women's Guild of the congregation. The cost has been about £12,500.

Mr. Delissa Joseph is the architect of the blocks of flats to be erected on the site of Stratheden House, Knightsbridge.


BALCONY
LIFT
TELEPHONE
MAYOR'S PARLOUR
ANTE ROOM
MAYOR'S ROBING ROOM
LAVATY
COUNCILLORS' LAVATORY
COUNCILLORS' RETIRING ROOM
RECEPTION HALL
DOWN
COUNCILLORS' WRITING ROOM
LIBRARY
ANTE ROOM
RECEPTION ROOM
CORRIDOR
COMMITTEE ROOM
AREA
DEPUTATION & COMMITTEE ROOM
COMMITTEE ROOM
LADIES' RETIRING ROOM
LAVATY
STAIRCASE
GALLERY
TOWN HALL CEILING PLAN
STAIRCASE UP TO PUBLIC GALLERY OF COUNCIL CHAMBER AND LIGHTING DEPT ON SECOND FLOOR
STAIRCASE UP TO OFFICIAL DINING ROOM, KITCHEN ETC ON SECOND FLOOR
ANTE ROOM
GALLERY CAR
REFRESHMENT ROOM LIGHT OVER
REFRESHMENT and SERVICE ROOM LIGHT OVER
COUNCIL CHAMBER DOMED LIGHT OVER
UPPER PART of ENTRANCE HALL DOMED LIGHT OVER
LIGHT OVER
MUSIC GALLERY
BANQUETING HALL DOMED LIGHT OVER
VESTIBULE LIGHT OVER
CORRIDOR LIGHT
RECESSES for EXHIBITS ETC
DOMED
10 5 0 10 20 30 FEET

FIRST FLOOR PLAN



GROUND FLOOR PLAN

A TOWN HALL FOR A LONDON BOROUGH. F. WINTON NEWMAN ARCHITECT.

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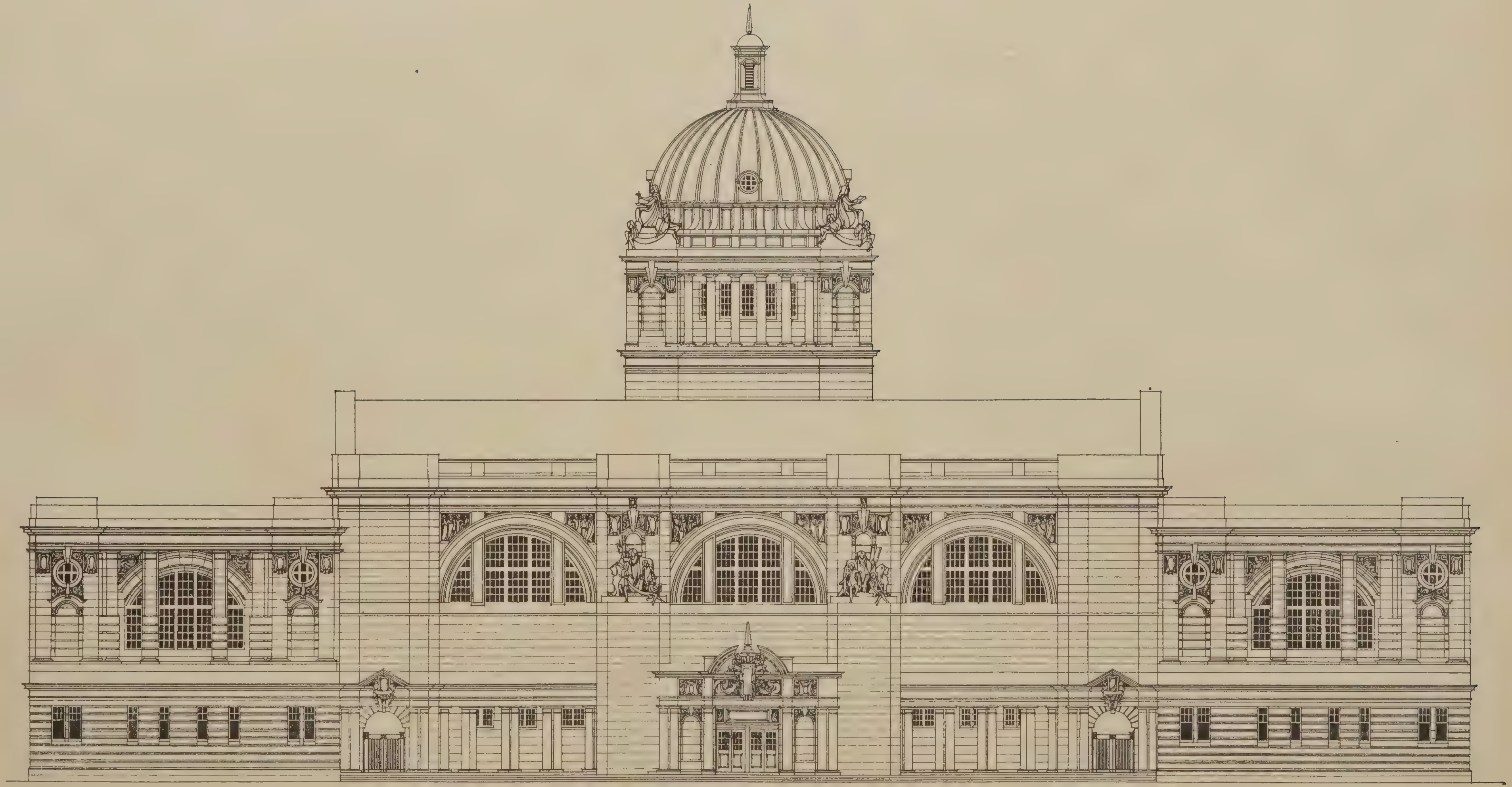
Wednesday, January 22nd, 1902.



A TOWN HALL FOR A LONDON BOROUGH · PRINCIPAL ELEVATION. F. WINTON NEWMAN, Architect.

Supplement to
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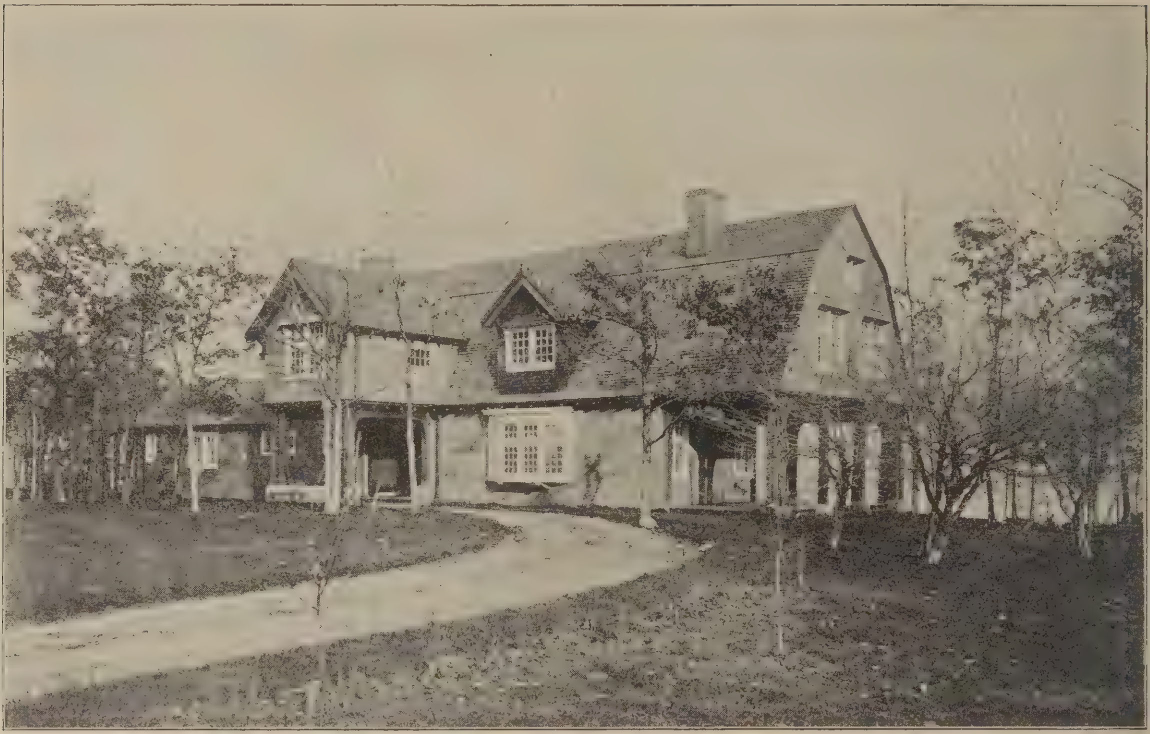
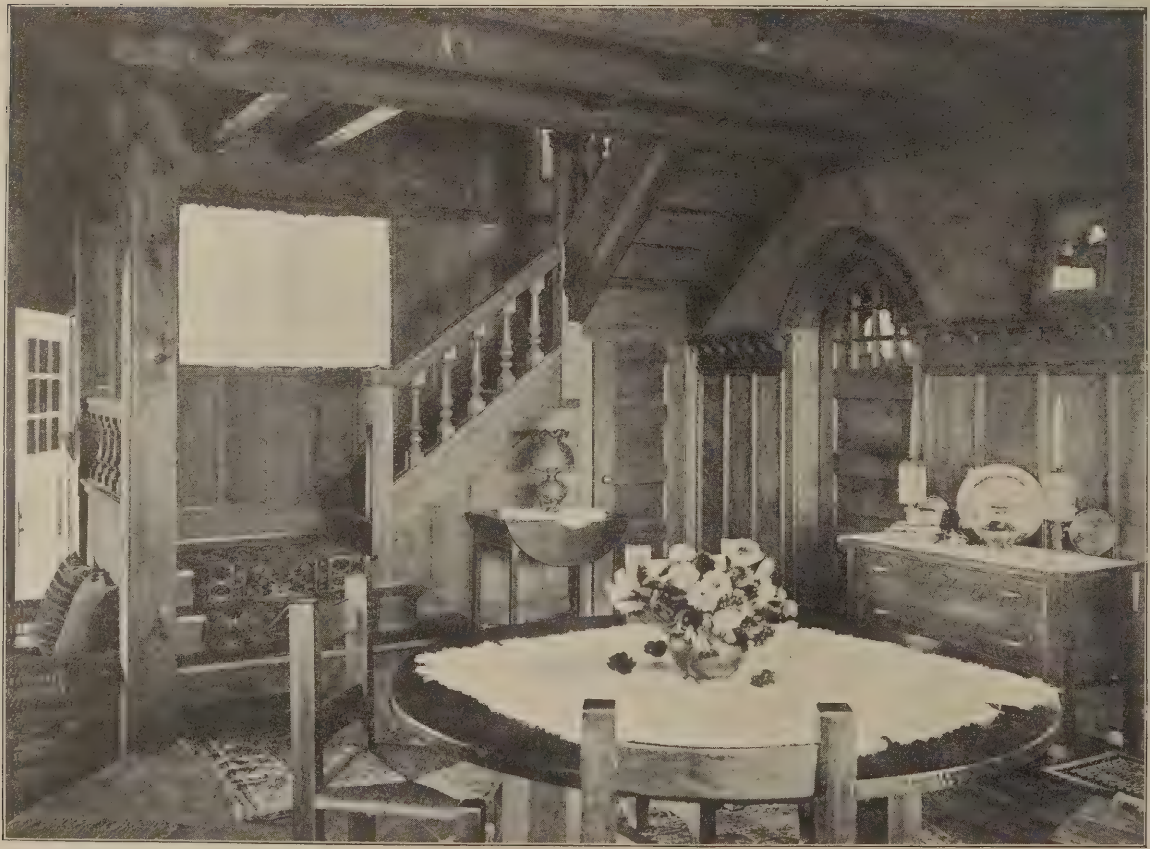
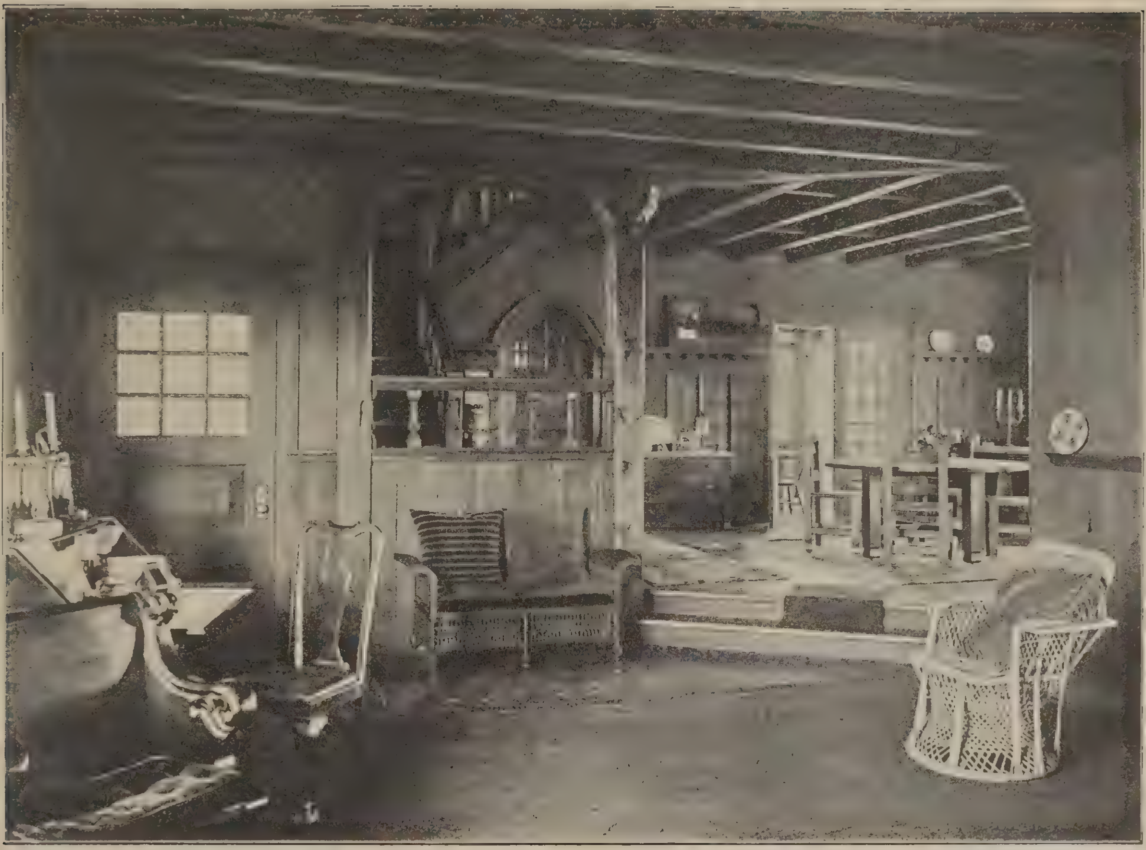


General View.

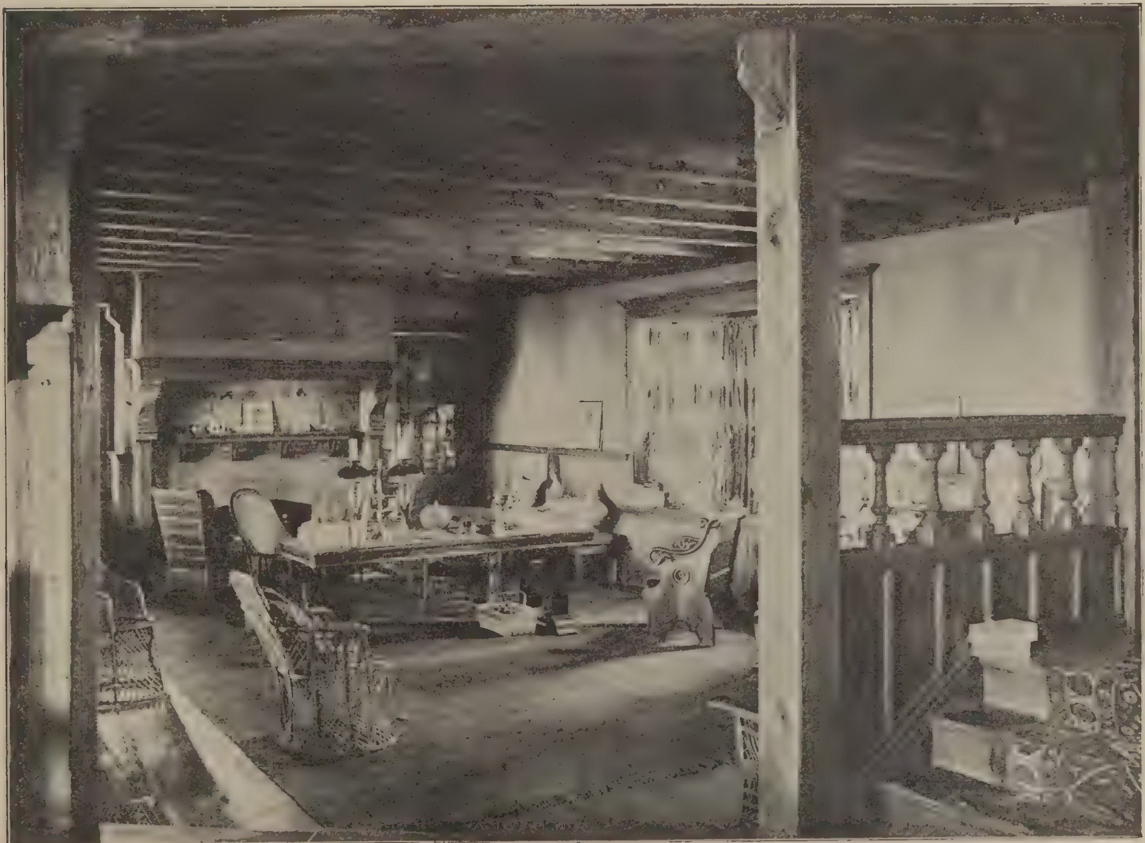


Morning-Room.

HOUSE OF HERBERT UNDERWOOD, FOX



Living-Room.



Living-Room.

NT, WISCONSIN, U.S.A. Elmer Grey, Architect.

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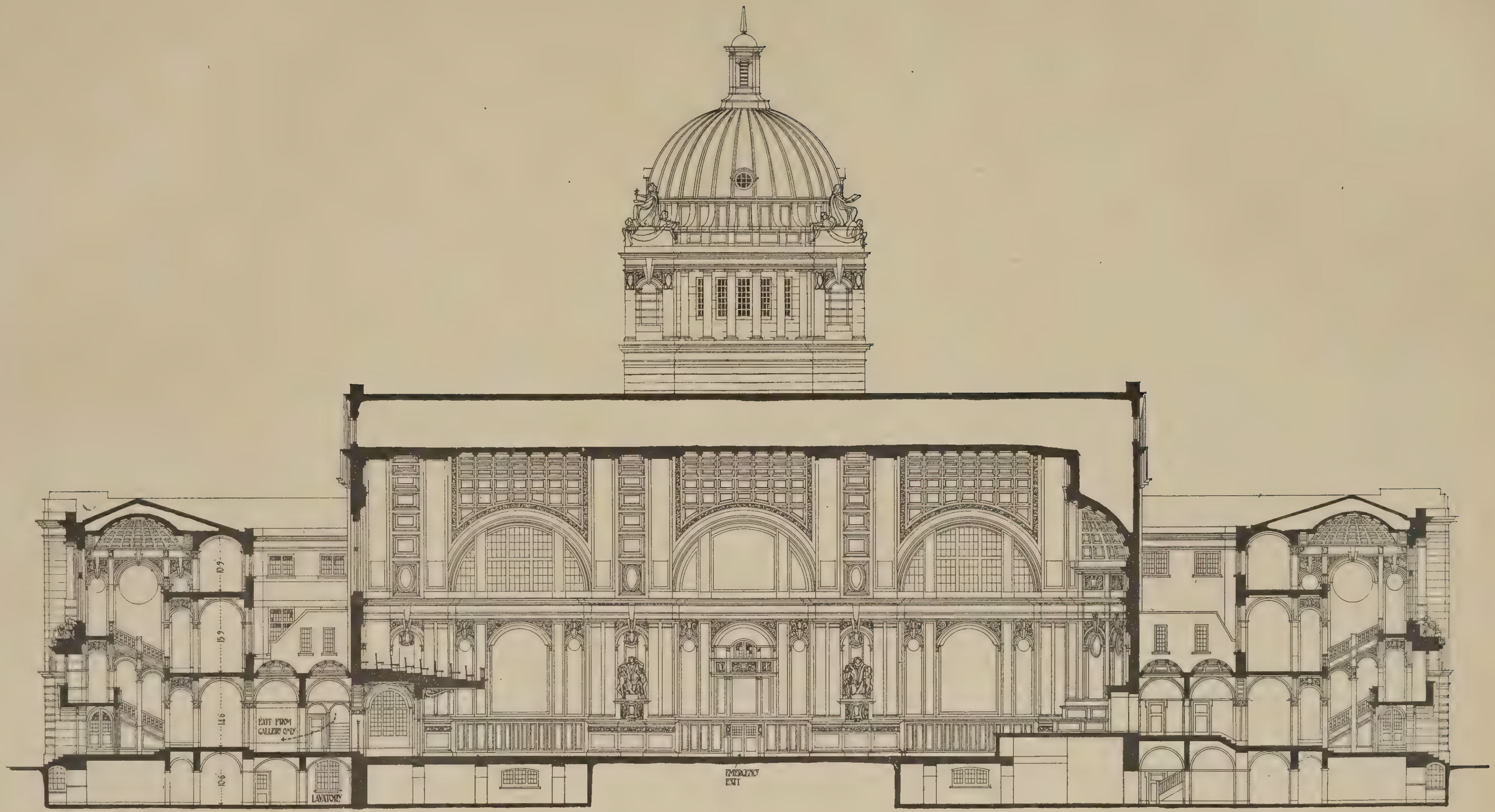

A TOWN HALL FOR A LONDON BOROUGH: LONGITUDINAL SECTION. F. Winton Newman, Architect.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Ordnance Survey.

CARLISLE.—W. E. C. writes: "Can you furnish me with any particulars of the survey just completed in the north of England? Does it confirm previous measurements in the last survey; are there any differences in the measurement of any of the base lines, and, if so, what are the differences?"

We forwarded our correspondent's letter to the Ordnance Survey Office, Southampton, and in reply the Director-General says that the questions are so vague that it is difficult to gather what our correspondent requires. "Beyond the revision lately of the southern portion of the West Riding of Yorkshire, no general survey has been in progress in the north of England during the last twelve months, and no base lines have been remeasured. If 'W. E. C.' desires information on any point, he should communicate with this office and specify clearly what he requires, when the matter shall receive attention."

Requirements in S.K. Building Construction Examination.

CAMBERLEY.—F. C. W. writes: "When sitting at the South Kensington examination in building construction, is it necessary to designate each particular part of a sketch or drawing by its correct technical term? For example, if required to give a section of a stone window-sill (elementary) there would be throating, weathering, groove for water-bar, &c.; should these terms be written against them in the sketch, whether asked for or not? Also, is a scale required to be given under each sketch?"

I do not think it is necessary to give technical terms unless the question distinctly asks for them. Suppose the examiner requires a sketch of a stone sill, as suggested. If the sketch or drawing is clear enough without written explanation, it should be sufficient. It is the business of the examiner to discover the amount of knowledge possessed by the examinee on the subject of the question. The examiner is not in the position of a person who needs to have the subject explained to him for his own sake, and elaborateness of answer should be studiously avoided. There is distinct danger to the candidate if he goes beyond the definite limits of the question, as in the case of the Scripture examinee who had successfully answered "Who was Saul, King of Israel?" but who added that he was "Saul (who also is called Paul)." If this redundant information had been correct, it could not have added to full marks; and, being incorrect, it merely damaged the candidate's reputation as a scholar of Scripture in the mind of the examiner. If scales are not asked for, they need not be given. Candidates should remember that the marking of questions is not the most exhilarating kind of work. In society one should avoid deserving the reputation of a bore—don't bore the examiner. You may be anxious to pass the examination. Within proper limits this will sharpen your wits, but the consequences of your answer should not be mixed up in your mind with the question. The particular question should wholly occupy your mind at the time. The manly straightforward attitude of mind which makes a good witness in a court of justice should also be that of an examinee at a written examination. J. P.

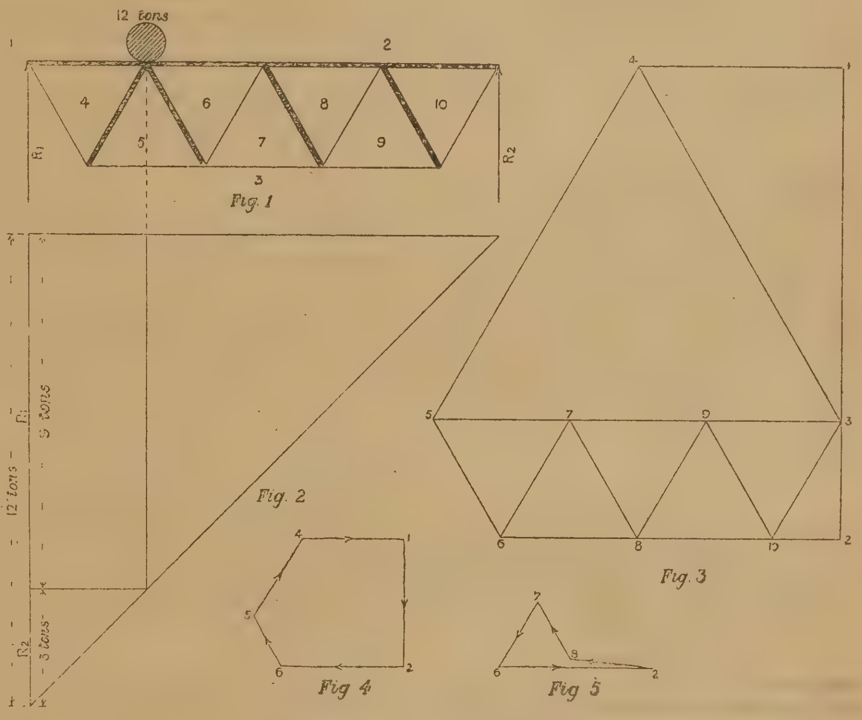
Ventilating Shafts.

EASTON.—VENTILATOR writes: "Having had a large experience in testing drains at large country mansions and other residences, I find that, when the atmosphere is heavy, with a very large number of ventilating shafts, although carried up to the ridge, the stench beats down and enters the house by the nearest open window. Can you suggest a remedy?"

There is nothing to prevent smoke or gases beating down under certain atmospheric conditions, but any nuisance arising from this cause is generally due to the fact that the chimney or ventilating pipe is too close to the window. The cheapest and best remedy is to add 5ft. or 6ft. to the height of the chimney or ventilating pipe. To avoid the risk of danger or nuisance from any issuing vitiated air, the top of a ventilating pipe should be arranged so as to be about 10ft. above any window, and in the case of dormer windows the ventilating pipe should also be carried up the roof until it has attained a horizontal distance of 5ft. or 6ft. to the rear of the window. T. E. C.

Stresses in Warren Girder.

LONDON, W.—J. P. writes: "There is a question in the Science and Art examinations which requires the candidate to determine graphically the nature and amount of stress set up in each member of a truss by the given load: scale 2 tons to an inch. This question would be very easy if there were a load at every point, but when there is only one load given at a certain point (as in the question) I can only work in the members which join that load at that particular point, which leaves more than half the truss with no stress whatever, and this seems impossible."



STRESSES IN WARREN GIRDER.

Let Fig. 1 be the skeleton elevation or frame diagram of girder. Below it draw Fig. 2, setting off the full load 12 tons and joining up the triangle. Then drop a line from the load in Fig. 1 to cut raking line of triangle and project horizontally to cut load line in the proportion of the two reactions R_1 and P_2. Now draw reciprocal diagram (Fig. 3) in the order of the numbering, the scaled lengths of the lines being the amount of the required stresses. To find the nature of the stresses, temporary arrowheads may be placed on Fig. 3, but it will be clearer to make separate sketches of the parts required, *e.g.*, for the stresses in the bars meeting under the load, take the required lines from Fig. 3 as shown in Fig. 4, and add arrowheads to show the direction of the consecutive lines from 1–2, which is known to be acting downwards. Then 2-6 is towards the joint in Fig. 1—therefore compression; 6–5 is towards the joint and therefore compression; and so on with 5–4 and 4-1, always going round with the clock. Now take the next joint, sketch the lines from Fig. 3 as in Fig. 5. Begin with 6–2, because the stress in this is known, and follow round with 2–8, 8–7 and 7–6. The advantage of the rough sketch for this purpose is shown by the separation of 2–8 from 6–2; they being really coincident. It will be observed that 7–6 is tension because it is acting away from the joint in Fig. 1.

HENRY ADAMS.

Architectural Appointments under Board of Works.

LONDON.—QUERIST writes: "To whom should I apply for information regarding examinations for appointments in the architectural departments of the Irish Board of Works and the English Board of Works?"

Consult the published questions of former examinations, issued by the Civil Service Commissioners, which you should be able to do at any good public library. These will give you a good idea of what is expected. You can form a fairly good notion of the probable yearly vacancies from the total number of men in the department you seek to join (say in a staff of thirty, one vacancy in the year). You will get an official, and more or less informing, reply to a letter addressed—in the case of the Irish Board of Works, to the Secretary, Board of Public Works, Ireland, the Custom House, Dublin; and in the case of the English Board of Works, to the Secretary, Works and Public Buildings, 12, Whitehall Place, London, S.W. When vacancies occur the examinations are advertised, but any candidate who seriously intends to compete, should specially prepare for the examination in anticipation of vacancies.

J. P.

Agreement not to Practise.

ALDA writes: "I was employed by a firm in Wolverhampton, and after being a year in their service I was asked to sign, and did sign, the following agreement: 'On consideration of your raising my salary from *x* to *x* per week I agree not to accept a situation with any firm in the same trade as yourselves within fifty miles of Wolverhampton.' I remained in their employment for two years after this event, and then, on account of private family business, was compelled to resign and go to Scotland. About five months later I was in a position to return, and offered my services again to this firm, but they were declined, my position having been filled in the meantime. Taking this action as breaking the agreement, I accepted a position in Birmingham; but on account of the Wolverhampton firm threatening proceedings I resigned and came to London, a Birmingham solicitor whom I consulted advising me that I had no case and that my only course was to leave the district. Does the agreement I signed now hold good, and is the firm entitled to keep me outside the fifty-miles radius?"

If the wording of the agreement was exactly as you state, it could not be enforced, for it would only hold good while you were in the firm's employ. The very comprehensiveness of the wording is, we think, destructive of their case. If, however, it was stated that in consideration of a sum of so many pounds being paid you in weekly instalments extending over a certain number of years or months you agreed to accept a situation as stated, and if this part of the contract was fulfilled, the agreement, we think, would hold good; but we do not consider, assuming your statement to be exact, that the firm could keep you out of any employment in the district.

Whitening Rough-Cast.

INGATESTONE.—R. H. B. writes: "In your last issue lime-white mixed with alum is advocated as the best material to use for whitening rough-cast. What should be the proportion of alum to lime-white?"

Make a thin solution of well-slaked lime with water; dissolve 1½lbs. of rock alum in boiling water; and add cold to each pail of lime-white.

Drainage Rights.

STUDENT writes: "Two semi-detached houses were the property of one owner for sixteen years, and then passed by will to different owners. After three years it has now been discovered that there is but one drain (or sewer) to the main sewer. Has the owner without drains acquired a right of drainage by means of the drains of adjoining house?"

Yes, the owner has apparently acquired a right to discharge his drainage into the drains of the adjoining house. T. E. C.

Cesspit for Cottages.

RADSTOCK.—S. J. G. writes: "What should be the size of a cesspit for twenty-four workmen's cottages to drain into? Would 14ft. by 12ft. by 6ft. deep be large enough?"

It is assumed that the rain- and storm-water is separately removed, and is not discharged into the cesspool. If the cesspool is intended to receive the whole of the foul drainage from the cottages—such as w.c.'s, sinks, &c.—then it should be about double the size mentioned, namely, 14ft. by 12ft. by 12ft. deep. On the other hand, if earth-closets are provided, then a cesspool 14ft. by 12ft. by 8ft. deep would be sufficiently large for the reception of fouled liquids from sinks, &c. T. E. C.

Strains in Ironwork.

HALTWHISTLE.—R. E. H. writes: "Where can I obtain Prof. Henry Adams's book on 'Strains in Ironwork,' and what is its price?"

The book is published by E. & F. N. Spon, Ltd., 125, Strand, W.C., price 5s.

Books on Architecture.

ELLISTOWN.—E. O. writes: "Kindly name a good illustrated book on architecture, showing a few good examples of each period."

We should think "The History and Description of the Styles of Architecture," by T. Talbot Bury (Crosby Lockwood & Son, 7, Stationers' Hall Court, E.C., price 2s.), would serve your purpose, but if you require a larger and more complete work get "Classic and Early Christian Architecture" by Prof. T. Roger Smith and John Slater, and "Gothic and Renaissance Architecture" by Prof. T. Roger Smith and Edward J. Poynter (Sampson Low, Marston & Co., Fetter Lane, E.C., price 5s. each).

Ancient Lights.

PLYMOUTH.—CONTRACTORS write: "What length of time must a window enjoy an uninterrupted view before it becomes an 'ancient light'? We are desirous of building stores on one side of our yard, on which abut two dwelling-houses which were built in June, 1887. We should not deprive the back rooms of these houses of their light to any great extent, but should prevent their overlooking our premises."

The period necessary to constitute right of light is twenty years, but as any obstruction must be in continuous existence for a whole year within these twenty years, the period is actually narrowed down to nineteen years and a day. You give us no definite particulars of the effect of the proposed building on the adjoining owner's light, but provided he obtains sufficient light for the carrying on of his business you can interrupt his view.

R. I. B. A.

PRIZES AND STUDENTSHIPS, 1902.

STONEHENGE.

A MEETING of the Royal Institute of British Architects was held last Monday evening, Mr. John Slater, vice president, occupying the chair. The hon. secretary, Mr. Alexander Graham, announced the decease of Mr. John Lee Hodgson, associate, who practised at Lille, France. The deed of awards in the Institute competitions was then read by the secretary, resulting as follows:—

Institute Silver Medal and 25 Guineas for Essays.—Not awarded. Mr. Geoffry Waddell, of Glasgow, was, however, awarded 10 guineas for his essay under motto "Serlio."

Institute Silver Medal and 10 Guineas for Measured Drawings.—Mr. Frederick W. C. Gregory ("Cavendo Tutus"). 5 guineas each were also awarded to Mr. R. Wynn Owen, A.R.I.B.A., of Liverpool ("Aidan"), Mr. Stanley Towse, of Catford ("Inca"), and Mr. Edwin F. Reynolds, of London ("H in circle").

Soane Medallion and £100.—Mr. James B. Fulton, of Glasgow ("Iona"). Medals of merit were also awarded to Mr. Lionel G. Detmar, of Sutton, Surrey ("Balneæ"), and Mr. Thomas Anderson Moodie, of Bayswater, W. ("Tepidarium"); and a certificate of hon. mention to Mr. Vincent Harris, of Regent's Park, N.W. ("Io.")

Owen Jones Studentship: Certificate and £100.—Mr. Edward H. Bennett. Ten guineas were also awarded to Mr. Percy E. Nobbs, of Chelsea, S.W., and five guineas to Mr. James McLachlan.

Pugin Studentship: Silver Medal and £40.—Mr. C. Wontner Smith, of Finchley, N. Five guineas each were also awarded to Mr. A. Muir and Mr. J. Myrtle Smith (of Stratford, E.); and a certificate of hon. mention to Mr. J. Harold Gibbons, of Manchester.

Godwin Bursary: Silver Medal and £40.—Mr. Charles A. Daubney.

Tite Prize: Certificate and £30.—Mr. Charles Gascoyne, of Nottingham ("Lion Heart"). A medal of merit was also awarded to Mr. Andrew Hutton ("In Memoriam"); and certificates of hon. mention to Mr. W. Curtis Green ("Marble"), Mr. Arthur R. Gough ("Rex" on grey strainers) and Mr. Cyril E. Power ("Shamrock").

Grissell Gold Medal and Ten Guineas.—Mr. Lionel M. Grace, of Steyning, Sussex ("Toby").

Asphitel Prize of books value £10 (for highest place in Examinations).—Mr. Charles Thomas Adshead, A.R.I.B.A., of Liverpool. A prize of books value £10 was also given to Mr. F. Dare Clapham, of Eltham, Kent, who obtained the highest number of marks on record in the Special Examination in June, and was not eligible for the prize.

Mr. Detmar J. Blow then read a paper on "The Architectural Discoveries of 1901 at Stonehenge," which was illustrated by a number of drawings and lantern slides. Mr. Blow described the excavations and the means of placing the largest leaning monolith into a vertical position to make it safe. This monolith had a decided entasis, and the semicircle of stones gradually rose in height to this one, which was the largest. The shape of these monoliths he thought might have been taken from flint implements, and the entasis suggested the origin of the column. Numerous flint instruments or tools were found beneath the stone, which had been used to work it, the larger evidently used as hammers to take off the greater roughness, and the smaller to dress it more carefully. A picture of Japanese workmen dressing similar stones by these means was shown. The large stones were of Sarsen and the smaller implements of a blue stone.

Sir Norman Lockyer, in opening the discussion, referred to the investigations he and Mr. F. C. Penrose had recently made with regard to the orientation of Stonehenge, which were described in a paper published by the Royal Society. From the evidences he thought they were justified in assuming that the Sarsen stones were erected in the Neolithic age—that was to say, before bronze was in use for ordinary work in this part of England. He and Mr. Penrose had been working for some time from a different point of view to other archæologists, in endeavouring to find the date of Stonehenge and similar monuments from their orientation. Stonehenge lent itself best to work with the theodolite, as it was not surrounded by mountains, the horizon being clear, and it was in a fair state of preservation. It was therefore selected for the experiment. In Egypt and Greece they had had a comparatively easy task, from the fact that the temples there were orientated to particular stars which changed their position very materially in a few hundred years, but Stonehenge had not been turned to the stars; people had, however, gone there from time immemorial to see the sun rise on the longest day, and it seemed certain that it had been planned for this. There was a very slight difference, which had been increasing for thousands of years, between the plane of the ecliptic and the plane of the equator, this angle being known as the obliquity of the ecliptic. Working on this they came to the conclusion that the approximate date of the erection of Stonehenge was 1680 B.C., which, however, could not be determined nearer than 200 years. The people who built these early monuments had been very much misrepresented by those who did not know what they were driving at. These early poor people, unless they found out the time of year for themselves, had absolutely no means of knowing when their agricultural pursuits were to be done, and these erections served the purpose of a calendar. At the very first blush of civilization, therefore, we found these temples. In Egypt, for instance, the first inhabitants determined the time of Easter, then the race that built the Pyramids determined the autumnal equinox, and at the time of the erection of the Temple of Thebes the inhabitants worshipped the Solstice, or midsummer, as did those at Stonehenge. Thus, first they determined the month of May, then August, and, lastly, the longest day.

Mr. F. C. Penrose said his and Sir Norman Lockyer's attention had been first called to the subject by noticing that the avenue at Stonehenge was exactly similar to the avenues of sphinxes in front of the Egyptian Temples. Mr. Gowland had estimated from the state of the flint implements found at Stonehenge that it dated from 2000 B.C., which approximately agreed with the date obtained from astronomical determination.

Mr. Emanuel Green suggested that the thirty stones at Stonehenge were used to determine the days of the month; and there was a thirty-first stone which would probably have been used for the five extra days. The stone used in the monuments was obtained on the ground in the form of large boulders which had been deposited by some geological means.

Mr. W. H. St. John Hope having spoken, Mr. Penrose stated that he thought Stonehenge was in all probability roofed in by means of beams laid flat.

On the motion of Mr. Slater a vote of thanks was accorded Mr. Blow, who, in reply, said he agreed in thinking Stonehenge was roofed in as, the outer circle of stones being lower, they would allow the water to be carried off. From the fact that everywhere inside the monument worked stones were found he gathered the whole place must have been used as a masons' yard. If the upright monoliths had been put in position by digging a sloping pit and sliding them down, a large mound would have been left in the centre from which baulks of timber could have been laid on to the uprights and the lintels rolled up on to them.

The American Office Building for the Strand, proposed to be erected on the site between the new Gaiety Theatre and the Law Courts, will not be built just yet, as the special committee of the London County Council to whom the matter was referred have refused a grant of 999 years lease, though they have expressed their willingness to negotiate with the syndicate on the basis of a 99 years lease; it is believed, however, that such a short lease would not meet the requirements of the syndicate.

BUILDING CONSTRUCTION.

(*Continued from p. 373, No. 361.*)

73. SINCE writing the previous article I have consulted Mr. John Emerson as to the details of slating from the workman's point of view. The bench, or "banker," is formed of whatever can be had; a rough box to carry the straight-edge over which the edge of the slate is laid to dress it to a straight line, and a sufficiently strong framework of slater's battens, on which the slate rests so that it does not need to be held up by hand. The slate should lie with a fall to the straight-edge so as to bear upon its corner. A common form of straight-edge is that shown at Fig. 101 (see previous article). It is a heavy iron dog supported as shown. The dressed corner of a piece of fairly hard stone or slate answers very well for a dressing edge. The dresser should observe whether there is any bend or camber in the slate; such a slate, if fit to be put into work, should lie *convex* up, and it may need to be redressed with this intention. The dresser's square should be a wooden T-square; an L-square is not so suitable, because the T-square lies better balanced on the slate, and it does not need to be turned for the second corner. The distance of the holes from the tail is marked on the blade of the square, and the length of the slate is also marked upon it. The dresser sees at once if a slate is too long or too short. He marks with the pick of his zax what dressing is to be done, and also marks the positions of the holes. It is good for the dresser to remember, when he has slates of different sizes marked upon the blade of his square, that the holing distance differs by half the amount of the difference of length; for example, for a slate 20in. long and for 3½in. lap the holing distance from the tail is 11¾in., and for a slate 26in. long the holing distance is 14¾in. When the slating is to be rendered it is useful to dress off about ¼in. from A to B (Fig. 108). This leaves an opening here between the slates into which the rendering squeezes, thereby obtaining a "key." There is a strong temptation to hole the slates with the pick of the zax, but this should not be allowed; they should be holed with the screw-punch shown at Fig. 107. The action of this tool is obvious. Fig. 108 shows how the tool is made use of; four pieces of slater's battens are nailed together as shown, and they and the tool are fixed to a box or bench. If one punch is used each slate has to be turned for the second hole; with two punches the slate only needs to be moved a short distance parallel to its first position to bring it under the second punch. A pair of labourers can hole slates with great rapidity in this way. It would appear that this arrangement makes marking the holes by the dresser unnecessary, but the marking involves little loss of time; and if the holing is done by labourers the marking is a check in the event of error or displacement in the frame. The hammer called a slater's hammer is shown at Fig. 109; it is a useful tool for repair work. In holing slates with the pick of the zax or of the slater's hammer it should be seen that the slate does not flake too much before the point. Remember that slates are cut by driving a row of holes on the line of division. A good plan is to do such holing not on an edge but with the slate laid upon a piece of wood—end wood is best—but often it is convenient to use the top of a rafter or a batten over a rafter. Many of the medium-sized slates now on the market are much too thin. The "quality" assigned to slates by quarrymen should not blind us as to what is best for the work. Workmen go up on roofs to do repairs and for various purposes; slates should be strong enough to bear somewhat rough treatment of this kind; and what quarrymen call "first quality" is not always the best quality for work.

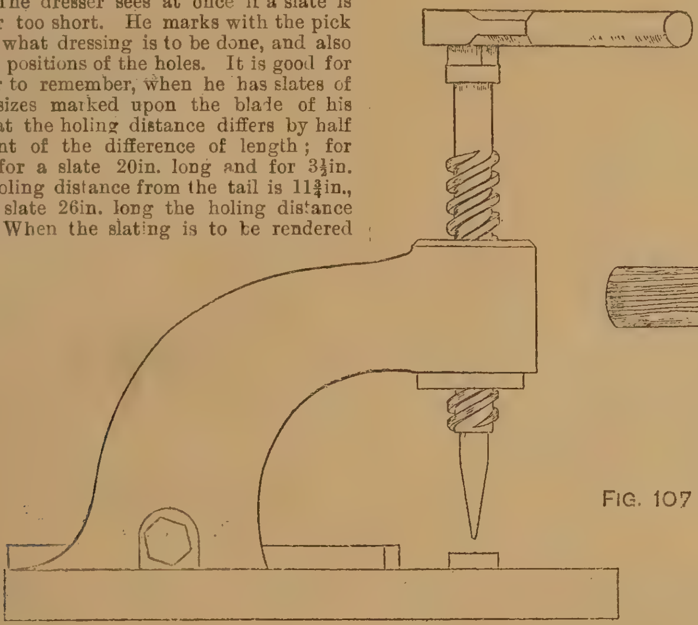


FIG. 107

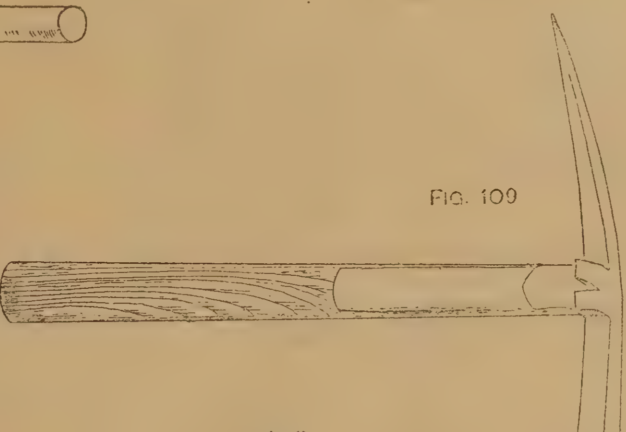
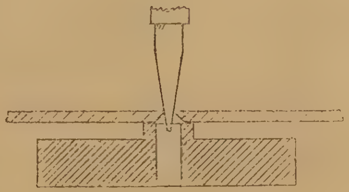


FIG. 109



The attention of students is directed to what is called the "grain" of a slate. It is not intended to deal here with the subject of slaty cleavage. The student may consult books of geology about it. If a piece of slate has two planes of cleavage nearly at right angles, it may easily divide into a bundle of slate pencils; this, however, is the extreme case. What is called the "grain" of a slate is its tendency to split lengthwise. This grain should always be the long way of a slate, because an up-and-down crack is a much less serious thing than a crack across. For under-eaves it might be thought convenient, as preventing waste, to use slates of the breadth required laid with the grain horizontal, but this should not be allowed.

In covering with slates of a definite size it is easy to keep the "perpends" right—that is, to have joints which break truly in line from ridge to eave; but it will be found that slaters, left to themselves, pay little attention to this refinement. They should attend to it, however.

Terms.—Head, top of slates as fixed; *tail*, bottom edge; *back*, upper surface; *margin* or *weather*, that part of a slate which is exposed to the weather; *lap*, the bond of three thicknesses of slate—it may be taken to be the distance from a nail-hole to the tail of the slate next above the nail-hole; *gauge*, the distance from the nail-hole to the head—it is also the breadth of the margin or weather; *bond* is suggested by comparing the appearance of slating to brickwork or ashlar, the bond being true when in all cases a joint meets the tail of a covering slate in the centre of its length: this particularly assumes slates of equal breadth having the perpends right.

Fig. 110 shows the arrangement for slating the cottages. It shows clearly a simple form of scaffold for these houses (of low height). The scaffold reaches to within about 2ft. of the eave. The bottom eave (doubling eaves-course) is laid on the tilting fillet, bedded on the beam filling, and nailed by the head to the first batten. The work is carried up as far as the slater can conveniently reach from the scaffold; he proceeds further by means of a ledger resting on creepies, which are made fast by light ropes to the ridge —or over the ridge.

Each slate covers an area equal to that of its margin or weather. For slates 20in. by 10in. and a 3½in. lap, this is 8¼in. × 10in. = 82·5 sq. in. A square of slating is 100 × 144 = 14,400 sq. in. It will therefore take about 175 slates to cover one square. This is on the supposition that it is all uniform slating; but allowance must be made for waste (*a*) owing to the doubling eaves-course; if we could imagine this course to be an ordinary course, from which the margins are cut off and reserved for the ridge, and that the length of the rafter suited the lap, there need be very little allowance on this score; (*b*) cutting for valleys, chimneys, &c.; and (*c*) an allowance for breakages and defective slates.

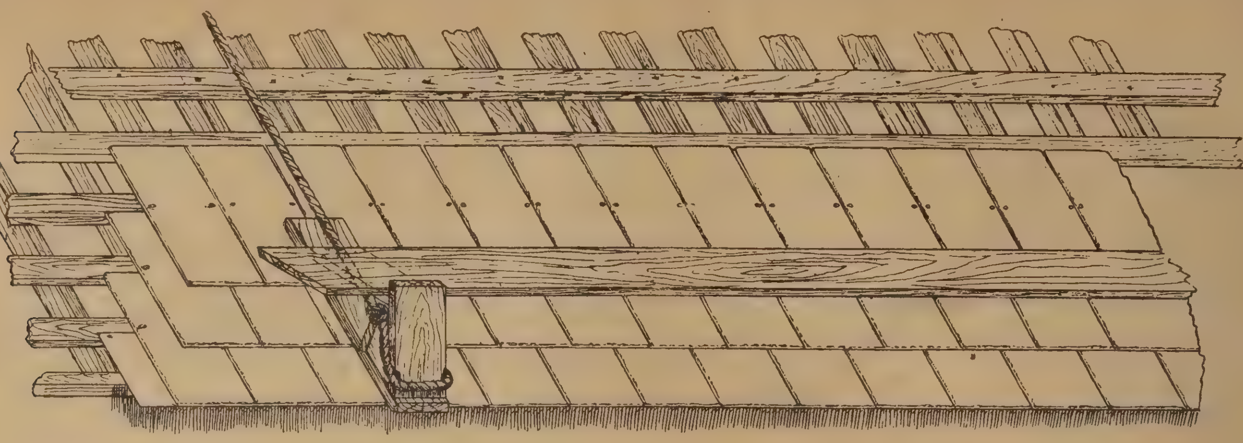
Plasterer.

74. The coarse stuff for plaster should be prepared as already described for making mortar for masonry where the lime is run to putty, except that more care must be taken in running the putty. The thickness of sand on the floor should be much less. For these houses we shall suppose that the lime is slaked in tubs, and that the milk is lifted in buckets and passed through a ⅜in.-mesh riddle placed on a stand (which may be rocked) at one corner of the floor. The sand forming the floor should be carefully screened before being put in position. The putty thus formed is of different qualities; that immediately below the riddle is coarser in grain. The very fine suspended particles of lime are carried away to the remote margin, and it is from this region the plasterer gets his putty for setting stuff.

To make coarse stuff: when the putty is cool add cowhair procured from a tannery, say about 1lb. of hair to a cub. ft. of putty. The hair should be long and clean, and free from grease. It is beaten with laths and thus opened out; it is mixed evenly through the putty by means of an iron rake; the haired putty and the complement of sand are now tossed, partially wetted, and let stand for two or three weeks to sour. Care should be taken that the sand is not sea-sand, because this, owing to the minute quantity of salt attached to each grain, takes moisture from the air and maintains the plaster of which it is a constituent in a damp condition. The mortar is tempered as already described.

The collars and rafters are to be lathed with *lath-and-half* laths, fastened with cut nails. Care is to be taken to allow sufficient space between the laths for the coarse stuff to squeeze through and bend over to form a "key."

The lathed work and the walls are now to be rendered (first or scratch-coated). A scaffold is put up to command the whole of the ceiling, the mortar-board is placed on a light cask about the centre, and the attendants must keep a constant supply of tempered coarse stuff on the mortar-board. The plasterer tries the stuff on the board with his trowel, takes up some on his hawk, and transfers it from the hawk to the lathing with his trowel, following the trowel with the hawk to receive any stuff that may fall away. The plasterer must not work his trowel across the laths in laying this first coat; such a mode would destroy connection between the



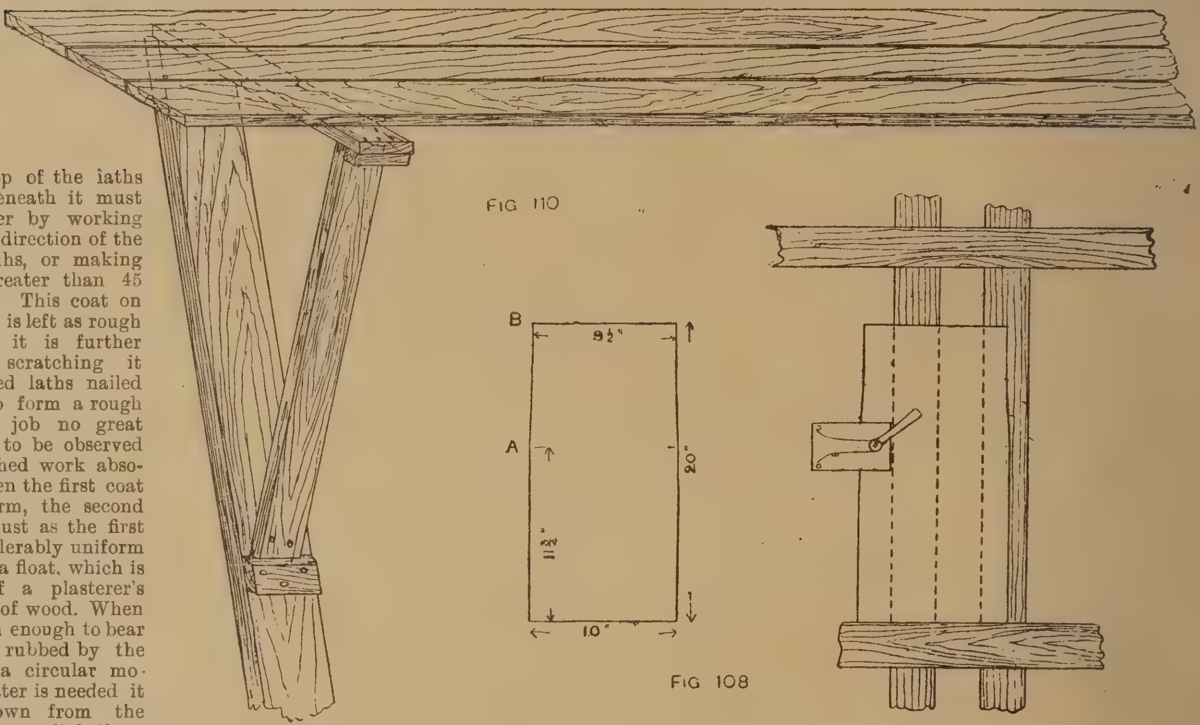


FIG 110

FIG 108

"keying" on top of the laths and the plaster beneath it must be laid on either by working the trowel in the direction of the length of the laths, or making an angle not greater than 45 degs. with them. This coat on lathing and walls is left as rough as possible, and it is further roughened by scratching it with some pointed laths nailed together so as to form a rough comb. For this job no great nicety will have to be observed to have the finished work absolutely true. When the first coat is sufficiently firm, the second coat is applied—just as the first coat was laid, tolerably uniform and floated with a float, which is of the shape of a plasterer's trowel, but made of wood. When the plaster is firm enough to bear it, its surface is rubbed by the float (giving it a circular motion); and if water is needed it is applied, thrown from the points of a brush, small hollows being filled by the application of small quantities of plaster. When the floating is sufficiently firm the surface is set with the fine part of the putty applied by the trowel and spread over the floated surface as thinly as possible; it is then trowelled, then wetted, and finished with a brush.

The outside walls are to be rough-casted. Mortar is prepared as for coarse stuff, except that no hair is added to it; it is applied with the trowel and hawk as for rendering, and this coat is rough-floated. It should be left as rough as possible; it is advisable to roughen it by means of a float with some small nails in its working face. The rough-cast is next applied. Some thin mortar rich in lime is made with sand and putty, and to this is added gravel of the proper coarseness for the rough-cast; it is easy to judge by trial when the proper proportions are attained. The rough-cast is applied by taking it up on small wooden spade-shaped tools and throwing it from these against the prepared walls. The slating at the eaves and reveals of windows, doors, &c., must be protected with bags or pieces of canvas, &c., from the stray splashing of the rough-cast. It is most important that the sand and gravel used for rough-cast shall be absolutely free from clay, as frost would, in the case of clay being mixed with the sand or gravel, destroy the work.

Ironwork.

75. The drawings show the eaves-gutters supported on iron hooks driven into the wall. In brickwork we can always find a joint into which a hook may be driven. It is a little more difficult where the wall is rubble-masonry. A hook should be driven as close to the socket of the eaves-gutter as possible. Suppose we are dealing with the single cottage (Fig. 81), and that we wish to utilize the roof-water. The gutter has a metal end at the left-hand end of frontage, and it falls, say, ¾-in. to the right-hand end. We can afford another ¾in. fall across the gable, and a little more than ½in. further fall will bring us to the shed near the back door. Here there will be a second dead-end and a piece with a hole for a swan-neck which discharges into a hopper over a down-spout, which discharges through a shoe into a barrel, which may be one of several set upon a rough stand and connected near the bottom with pieces of galvanized-iron pipe. (If any potable use is likely to be made of rainwater it should not, if possible, lie in lead. No doubt we have provided a lead valley and lead flashings, but owing to the short time the water is in contact with them they probably do but little harm; nevertheless they are objectionable. Spring water containing earthy salts does not combine with lead.) Water is drawn from the casks by a cock, which must be a good-fitting one, because a very small leakage is serious in such an arrangement. These eaves-gutters may be 4in. half-round, and the down-spouting 3in.; the piece across the pigstye-eave will discharge by a swan-neck into one length of down-spout furnished with a shoe delivering on the ground at the outer end. The gutters, &c., shall be jointed with a mixture of white and red leads, and fastened with screws; the hooks shall be of ½in. iron, and they shall have sufficient wall-hold. The piggery gate shall be strongly made; the cross-rails shouldered to the heel-post, and well riveted to both heel-post and striking bar. It shall be properly hung, turning on an iron socket let into the sill, and held at the top by a good strong strap-eye, well secured, built in with cement in the piggery wall; it shall have a proper running bolt to run into a sufficient eye made in a good-sized stone set there for the purpose. It shall open inwards, and it shall have a sufficient iron stop to prevent it opening outwards; the gate shall be properly proportioned, and it shall weigh 70lbs.

In the kitchen shall be provided and properly fixed a grate suitable for an open fire of wood or turf with oven No. , page S.'s catalogue, list price £1 10s., or from a different maker equally as good as that quoted. The bedrooms shall be fitted each with a mantel-grate No. , page , S.'s catalogue, list price 12s. These grates shall be properly set and fixed, having firebrick settings properly laid in fireclay. The jambs of the kitchen fireplace shall be finished in cement-plaster neatly worked to the general plaster of the breast.

Glazier.

76. The common window-glass now in use is sheet glass, which is to be had of various thicknesses and qualities; 15oz. glass averages 15oz. in weight per super. ft. The glazier lifts a sheet of glass out from a crate of sheets; taking hold of it by the top edge in both hands, he rests it on its bottom edge on the table and lowers it flat, supporting it with a hand in the middle as he does so. He decides how he shall cut up the sheet to get the special size of panes out of it with least waste; his tools are (*a*) a cutting diamond, (*b*) a light flexible straight-edge of wood, (*c*) a wooden T-square

with long thin blade, (*d*) a large pliers, (*e*) a puttying knife. Let not the ordinary individual who has never tried it before think that, given a glazier's diamond and straight-edge, he can cut glass. For most diamonds there is only one position in which it must be held to make a good cut. The glazier sets it in this position by habit and use, and he knows from the sound he makes as he draws it along the glass, pressing gently against the straight-edge, whether he is "cutting" or merely "scoring" the glass; he keeps his hand in the same position during the whole length of the cut. He marks the sheet into breadths with a small piece of dry soap; he cuts it up to these breadths in succession, and using his T-square and a standard length he divides the strips of glass into panes of the proper size. Usually he cuts clean and safely, but he may need his pliers to take off a too sharp corner or to take hold of a very thin paring. The glazier's cut must not be too complete; the pieces are separated with some little strain, allowing the piece he is taking off to hang over the front edge of his table. A cut that is too complete may run faster than the diamond and result in the destruction of the sheet.

Glazier's putty is made from whiting and linseed oil, either boiled or raw. Sometimes the putty is mixed with red lead, and such putty becomes very hard in time, so that it is not easy to remove it when it is necessary to do so to fix a new pane. When raw oil putty is painted over it is a very long time before it gets hard. Boiled oil putty gets hard sooner. Raw oil putty is not so nice to handle and work as boiled oil putty. As a rule, glaziers do not now mix the putty they use; they buy it made up in casks ready mixed. The operation of glazing common sashes is exceedingly simple. The sashes are first primed, and when the paint is dry some putty is placed along the rebate of the sash round the openings for the panes by the glazier, using either his thumb or his putty knife for this work; the panes are pressed into this, called the bedding; they are next tacked in place; then the sash is top-puttied, the glazier using a puttying knife, holding some putty always in the palm of his left hand; the sash is now set up, with the bedding side turned to the glazier, who cuts off the surplus putty, makes up any deficiencies, and smoothes off the surface. The sash is now lightly brushed with a duster and set aside as glazed.

There remains painting and plumbing; but it is advisable to deal with these trades in connection with larger houses.

(*To be continued.*)

Surveying and Sanitary Notes.

A Lady Sanitary Inspector for the City.—The City Corporation has decided to appoint a female sanitary inspector. Applications for the post, the remuneration of which commences at £125 and rises to £150, are invited, and must be delivered at the Guildhall not later than Saturday, February 1st.

Fleet Street Widening. — With the sale by Messrs. Douglas, Young & Co., on January 22nd, of the corner site adjoining the "Old Bell" in Fleet Street, the important improvement at this end of the thoroughfare will be completed.

The View from Richmond Hill. — Mr. Max Waechter, Deputy-Lieutenant of Surrey, who recently bought and presented Petersham Ait to the Richmond Corporation, has purchased Petersham Lodge, lying just beyond Petersham Meadows, towards preserving the view from Richmond Hill. This estate was recently offered to the Richmond Town Council for £10,000.

Mr. Richard William Griffiths died on January 10th at 120, Melfort Road, Thornton Heath, Surrey, and was buried on Wednesday last at Highgate Cemetery. Deceased, who was in his seventy-second year, practised as a quantity surveyor for nearly fifty years in various parts of London, latterly under the style of R. W. Griffiths & Son, at 22, Henrietta Street, W.C. The business will be continued under this title by his son, Mr. Owen Griffiths.

Masters and Men.

Wages in the Building Trade in 1901 are stated by the Board of Trade to have experienced a further rise, but only about half as great as in 1900. Nearly 30,000 operatives received advances, and 6,614 (most of whom are in Scotland) sustained decreases, the computed nett increase in the average weekly wages of the workpeople affected being 1s. 3¼d. per head.

The Bradford Dispute which has been proceeding between the master-masons and their operatives was brought to a settlement last week after a cessation of work which has lasted since May 1st of last year—eight-and-a-half months. The masons have resumed work at a reduction of wages of ½d. per hour, and agree to work peaceably with non-unionists, while the masters withdraw a demand for a change in the dates on which notices of alterations in the conditions of work should be given.

New Patents.

These patents are open to opposition until February 24th.

1900.—**Purifying Air.**—23,435. W. Key, 109, Hope Street, Glasgow. A solution of barium hydrate or peroxide of iron is allowed to trickle down screens or rods, in combination with hydrated oxide of lime, and the air is forced or drawn through by a fan: the object being to extract carbonic acid, sulphuretted hydrogen, ammonia, dust and other organic matter in the air.

1901.—**Tramway Paving Blocks.**—3,620. H. Melsom, 121, Colmore Row, Birmingham. In order to form a water-tight joint and prevent the rail corroding, bituminous cloth is put between the rail and the paving blocks; moreover, the rail is bedded on bituminous cloth. Wedge-shaped blocks with similar cloth joints are provided outside those adjacent to the rail, the object being to facilitate removal.

Venetian Blinds.—13,773. W. H. Douglas, 2, St. Bee's Street, Denmark Road, Greenheys, Manchester. The blind can be used either as a short one for the lower portion of the window, or for the whole of the window—this by means of two sets of cords working over pulleys in a top rail.

Hollow Bricks.—22,827. D. W. Anderson 526, South Laurel Street, Richmond, Henrico, Virginia, U.S.A. The brick is pierced throughout its length with three holes or passages and carries on its outer face a ribbed tile, which is plastered. When built in position, the passages are continuous throughout the walls and may be used for heating or cooling the apartment they enclose.

The following specifications were published on Saturday last, and are open to opposition until February 31st. A summary of the more important of them will be given next week.

1900.—19,571, Spooner, machinery for making sawdust, shavings, &c., into fuel. 23,412, Cameron, Commin & Martin, apparatus for purifying sewage. 23,627, Jennings, circular pocket slide-rule for timber. 23,676, Regnander, apparatus for transporting, elevating and piling lumber. 23,851, Diesler, manufacture of cement.

1901.—558, J. Duckett & Son, Ltd., Duckett, Button & Bullock, top-flushed slop-water closets. 1,833, O'Brien, disinfectant flushing cisterns. 2,700, Gibbons, panic bolts for doors. 3,272, Ashton soil-pipes. 3,351, Shanks, water-closets and cisterns. 3,352, Shanks, fittings for lavatories, baths, &c. 3,954, Wintle, fastening device for hand tools. 4,074, Hamblett, self-locking hingeless door. 4,124, Mackay, cocks and taps. 5,257, Jacquart & Booraem, brick- or tile-coverings for beams. 8,700, Taylor & Kersett, fastenings for the doors of cold stores. 23,636, Reck, radiators for heating. 23,981, Wellington, street lamp-posts. 24,345, Horton, street door bells. 24,376, White & White, syphon-flushing cisterns and wash-out closets.

Engineering Notes.

Mr. Robert George Young, M.I.C.E., resident engineer at the London County Asylum, Colney Hatch, died recently at the age of 53 years.

Municipal Tramways for Wigan.—The Wigan Corporation have agreed to purchase the Wigan Tramways Company. The price is £45,000. The Corporation proposed to work the lines by electricity, in conjunction with the existing system.

At the Drury Lane Pantomime the elaborate electrical effects in the great fan scene are installed on the E.L.B. system. Several thousand lamps are used nightly. The same system of the Electric Lighting Boards Company has also been applied for Mr. Moss's large "Cinderella" pantomime at Liverpool.

Engineering Standards Committee.—The Lords Commissioners of the Admiralty have nominated Mr. W. E. Smith, chief constructor, as their representative on the Engineering Standards Committee, and the Marine Department of the Board of Trade is to be represented on the same committee by Mr. Peter Samson, Engineer-Surveyor-in-Chief.

American Workshop Methods: Why they Succeed.—At a meeting of the Institution of Civil Engineers held on January 14th (Mr. Charles Hawksley, president, in the chair) a paper was read on "American Workshop Methods in Steel Construction" by H. B. Molesworth, M.I.C.E., in the course of which he referred to the bridge shop at the Pencoyd Works of the American Bridge Co., near Philadelphia, which is electrically driven, each of the cranes and larger machines having an independent motor. The drawings are prepared in a very complete manner and give much more information than is usually furnished on drawings in England. Great care is taken to minimize smith's work, and to duplicate as many parts as possible. Mr. Molesworth said that the causes of cheap working in America might be summed up as follows:—(1) The workmen, though more highly paid than in England, turned out a much larger quantity of work. (2) The arrangement of the works was more carefully thought out, and labour-saving appliances were more used. (3) There was more method, and probably more scientific knowledge, in the drawing-office. (4) The works were run night and day. (5) The templating was reduced to a minimum by care in the drawing-office and by the use of automatic machinery and stops and guides. (6) Obsolete machinery was turned out of the works as soon as it was superseded by anything better. (7) All tools were kept in a state of perfect efficiency. (8) Railway freights were lower than in England.

Explosions in Electric Street-Boxes. — On Wednesday last at the Guildhall Mr. A. C. Trotter held at enquiry on behalf of the Board of Trade into the explosions which occurred on January 4th and 5th last in the electric street-boxes at King Edward Street and Newgate Street. Mr. W. H. Catchell, engineer-in-chief to the Charing Cross and Strand Electricity Supply Corporation, said that a man went down the manhole to investigate a defect, but found the air so stifling that he had to leave hurriedly. In the western districts the company worked with ventilated conduits, so that if there was an escape or overcharge of bitumen gas it could be confined to where it occurred, but different conditions prevailed in the area in question. The first explosion was the result of the lowering of a lighted lamp, which exploded the bitumen gas; and the second resulted from the lighting of a match by an employee when he thought all was clear. Mr. Catchell said he did not think any better system than the present could be adopted by his company to prevent explosions. There was no regulation of the Board of Trade providing for special ventilation of the street-boxes. The explosion in the street-box of the City of London Electric Lighting Co. was then enquired into, and the engineer of the company gave it as his opinion that the explosion was probably due to increased heat in the temperature affecting the tubing, as certain parts of it showed signs of having been heated. He suggested as a possible preventative of explosions the metallic covering-in of the wires. Other technical evidence having been given, the enquiry closed.

FIRE-RESISTING BUILDINGS.

The Associated Fire Offices' New Specifications.

As briefly announced in our last issue, in order to encourage the construction of buildings of better fire-resisting character than most of those ordinarily classed as "fireproof," the Associated Fire Offices have drawn up two new specifications: one for buildings occupied as cotton-mills or woollen-mills, or buildings for similar textile trades; the other for ordinary buildings, as sale-shops, warehouses and factories other than cotton-mills, &c. It is intimated that the Fire Offices will make reductions in rates for buildings which conform to these specifications.

I.—The following specification is applicable only to buildings occupied as cotton-mills or woollen-mills or to buildings used for similar textile trades:—

Height and Area.

1. Height not to exceed four storeys and cellar. The ceiling of the cellar not to be more than 3ft. above the lowest point of the land level or ground line of the site on which the building stands.

2. Superficial area of any one compartment not to exceed 25,000 sq. ft. internal measurement, excluding area of window recesses and doorways.

> *N.B.—The height of any compartment, excluding cellar, to be not less than 12ft., measuring from the floor level to the highest point of the ceiling.*

External, Party and Internal Walls and Partitions.

3. Brick, terra-cotta or cement-concrete composed of broken brick, burnt ballast, furnace slag, clinker, or other similar hard and burnt material.

4. No external or party or division wall to be less than 13in. thick in any part, or if of concrete 20in.

> *N.B.—Stone used externally only as ashlaring or facing, with a backing of brickwork not less than 13in. thick, and for dressings, sills, string-courses and cornices, allowed.*

5. All internal partitions to be of incombustible material, excepting only office enclosures of hard non-resinous wood with or without glazing.

6. If there is any building adjoining, the dividing or party wall to extend at least 3ft. above the roof of the fire-resisting building.

Flues.

7. All flues to be built of brickwork, no part of which towards the interior of the building is to be less than 9in. thick, and all furnace flues to be lined with firebrick throughout for a distance of at least 20ft. from the furnace. No timber or woodwork to rest in or be plugged into the brickwork of any flue.

Openings in External Walls.

8. The total area of openings in the external wall of any storey not to exceed one-half of the area of the wall (measured as to height from floor to ceiling of the storey in which the openings occur). All loop-hole or teagle doors and frames and window-frames and sashes to be of iron or other hard metal.

9. Every window or other opening opposing (whether directly or diagonally) and within 20ft. of any window, skylight or glazed or other opening in any other building (whether such latter window, skylight or opening be protected or not), or overlooking (whether directly or diagonally) and within 20ft. of the non-fireproof roof of any building, to be protected by "fireproof" shutters or "fireproof" doors which are automatically self-closing in case of fire.

Floors.

10. Brick arches, terra-cotta, fireclay, or concrete as above described, the floor being in no part less than 6in. in thickness, and carried on metal joists, girders and columns or brick walls or piers.

> *N.B.—Floors of wood not less than 9in. thick, ceiled with plaster or metal lathing, and with the floor boards laid on the bearers without intervening space, allowed.*

11. Wooden flooring laid on brick arches, terra-cotta, fireclay, or concrete as above described allowed, provided there is no intervening space. Wooden fillets not exceeding 3in. deep permitted if laid on brick arches, terra-cotta, fireclay, or concrete as above described, the intervening spaces being filled with incombustible material.

11A. Scuppers to carry off water, the opening of each of which shall not be less in area than 21in. super., to be provided in the external walls to each floor at intervals of not more than 25ft.

Roofs.

12. Roofs to be entirely of the incombustible materials as described for floors in Rule 10, except that 4in. be substituted for 6in. thick, but there may be erected above them light shelters or roofs constructed entirely of incombustible materials.

> NOTE.—*Glass not less than ¼in. thick in sections, not exceeding 36in. super., and wired glass not exceeding 1in. mesh, in sections not exceeding 144in. super., in either case set in metal, shall for the purpose of this rule be deemed incombustible. Outlets on to roofs rendered necessary to satisfy the requirements of the Factories and Workshops Act permitted, provided that all doors and frames be of iron or cased in iron plate at least ⅛in. thick, and that they be self-closing.*

Protection of Structural Metal Work.

13. All columns or stanchions to be covered with brickwork or porous terra-cotta (at least 2in. thick), or with cement, concrete, or plaster at least 1½in. thick, keyed into metal supports and protected by a metal guard up to a height of not less than 4ft. from the floor where cement, concrete or plaster only used.

14. Girders, joists, lintels, and all structural metal work (other than columns and stanchions, but including framework of roofs), where not covered with brickwork, to be completely encased in porous terra-cotta at least 2in. thick, securely anchored, or cement, concrete or plaster at least 1in. thick keyed into metal supports.

15. Space must be left at the ends of girders and joists to permit of expansion.

Linings and Ceilings.

16. No lining of wood or textile fabric to any part of the walls, partitions, ceilings or roof.

Floor Openings.

17. No openings through any floors allowed except holes to admit steam, gas and water pipes, and iron or earthenware tubes for electric conductors. All pipes and tubes to be cemented round the full thickness of the floor.

> *N.B.—All staircases, hoists, rope and strap races, and gearing-towers to be external to the four walls of the building and constructed entirely of brick or cement-concrete, as above described, at least 9in. thick.*

Hoists must be constructed in the staircase enclosures, and no opening thereto to be less than 6ft. from any opening into the building. Excepting hoists, the enclosing walls must be carried through and 18in. above the roof of the building, and the roofs, stairs and landings of said enclosures must be constructed of incombustible material. No openings permitted between the building and the rope and strap races and gearing-towers, and each opening from the staircase into the building to be protected by a "fireproof" door.

Shafting through Walls.

18. Shafting where passing through walls to fit closely into wall, or have wall-boxes closed with iron-plates not less than ¼in. thick, leaving no open space.

Pipes and Electric Conductors.

19. All pipes in the building, except water-pipes not exceeding 1½in. in diameter, to be of hard metal. No wooden casing to be used for enclosing electric conductors.

Communicating Compartments.

20. Two or more compartments each constructed in accordance with these Rules may communicate, whether by double "fireproof" doors or otherwise, provided that their aggregate superficial area does not exceed 25,000 sq. ft.

21. Two or more such compartments, whose aggregate superficial area exceeds 25,000 sq. ft., can only be allowed to communicate across a fireproof compartment, built up from the basement with walls of solid brickwork, and constructed in all other respects in accordance with these Rules, so far as the same are applicable, and having all openings protected by "fireproof" doors at least 6ft. apart.

22. Except as above, no communication allowed between a compartment constructed in accordance with these Rules and any other compartment.

II.—The following specification is applicable to ordinary buildings, such as sale-shops, warehouses and factories, excluding cotton-mills and buildings occupied for similar textile trades:—

Height and Cubical Contents.

1. Height not to exceed 80ft., measured from the lowest point of the land-level or ground-line of the site on which the building stands to the level of the highest part of the roof.

2. Cubical contents of any one compartment not to exceed 60,000 cub. ft.

> *N.B.—In computing cubical contents the whole surface, area, including half of the party-walls and the whole of the external walls, and the actual height from the surface of the lowest floor, are to be measured.*

Walls and Partitions.

3. Brick, terra-cotta or cement-concrete composed of broken brick, burnt ballast, furnace slag, clinker, or other similar hard and burnt material.

4. No external area or party-wall to be less than 13in. thick in any part, or, if of concrete, 20in.

> *N.B.—Stone used externally only as ashlaring or facing, with a backing of brickwork not less than 13in. thick, and for dressings, sills, string-courses and cornices, allowed.*

5. All internal partitions to be of incombustible material, excepting only office enclosures of hard non-resinous wood with or without glazing.

6. If there is any building adjoining, the dividing or party-wall to extend at least 3ft. above the roof of the fire-resisting building.

Flues.

7. All flues to be built of brickwork, no part of which towards the interior of the building is to be less than 9in. thick, and all furnace flues to be lined with firebrick throughout for a distance of at least 20ft. from the furnace. No timber or woodwork to rest in or be plugged into the brickwork of any flue.

Openings in Walls.

8. The total superficial area of openings in each external or area wall of any storey above the ground storey not to exceed one-half of the area of the wall (measured as to height from floor to ceiling of the storey in which the openings occur). All loop-hole or teagle doors and frames and window frames and sashes to be of iron or other hard metal. All windows above the ground storey to be glazed with glass not less than ¼in. thick, in sections not larger than 2ft. super., or wired glass not exceeding 1in. mesh in sections not larger than 4ft. super.

9. Every window or other opening above the ground storey opposing (whether directly or diagonally) and within 20ft. of any window, skylight, or glazed or other opening in any other building (whether such latter window, skylight or opening be protected or not), or overlooking (whether directly or diagonally) and within 20ft. of the roof of any building, to be protected by "fireproof" shutters or "fireproof" doors.

Floors.

10. Brick, arches, terra-cotta, fireclay, or concrete as above described, the floor being in no part less than 6in. in thickness, and carried on metal joists, girders and columns, or brick walls or piers.

> *N.B.—Floors of wood not less than 9in. thick, ceiled with plaster on metal lathing, and with the floor boards laid on the bearers without intervening space, allowed.*

11. Wooden flooring laid on concrete allowed, provided there is no space between the wood and the concrete. Wooden fillets not exceeding 2in. deep permitted if bedded flush in the concrete.

12. Scuppers to carry off water, the opening of each of which shall not be less in area than 21in. super., to be provided in the external walls

to each floor above the ground storey at intervals of not more than 12ft.

N.B.—In buildings within the City of London or within the area controlled by the London County Council, scuppers are not essential.

Roofs.

13. Roofs to be entirely of the incombustible materials as described for floors in Rule 10, except that 4in. be substituted for 6in. in thickness.

NOTE.—*Glass not less than ¼in. thick in sections not exceeding 36in. super., and wired glass not exceeding 1in. mesh, in sections not exceeding 144in. super., in either case set in metal, shall for the purpose of this rule be deemed incombustible.*

Outlets on to roofs rendered necessary to satisfy the requirements of the Factories and Workshops Acts permitted, provided that all doors and frames be of iron or cased in iron plate at least ⅛in. thick, and that they be self-closing.

Protection of Structural Metal Work.

14. All columns or stanchions to be covered with brickwork or porous terra-cotta (at least 2in. thick), or with cement, concrete, or plaster at least 1½in. thick, keyed into metal supports and protected by a metal guard up to a height of not less than 4ft. from the floor where cement, concrete or plaster only used.

15. Girders, joists, lintels, and all structural metal work (other than columns and stanchions, but including framework of roofs), where not covered with brickwork, to be completely encased in porous terra-cotta at least 2in. thick, securely anchored, or cement, concrete or plaster at least 1in. thick keyed in metal supports.

16. Space must be left at the ends of girders and joists to permit of expansion.

Linings and Ceilings.

17. No lining of wood or textile fabrics to any part of the walls, partitions, ceilings, or roof.

Floor Openings.

18. No openings through any floors allowed except as follows:—

(*a*) Holes to admit driving shafts, pipes, and iron or earthenware tubes for electric conductors. Shafts to fit closely in metal collars, and all pipes and tubes to be cemented round the full thickness of the floor.

(*b*) Staircases and hoists of which the enclosures are constructed entirely of brick or cement-concrete as above described at least 9in. thick, with a regulation 'fireproof" door to every opening.

N.B.[1]*—Stairs and landings within said enclosures to be constructed of incombustible material.*

N.B.[2]*—Where the building is within the City of London or in the area controlled by the London County Council, hardwood doors to openings may be allowed instead of "fireproof" doors.*

N.B.[3]*—Where the staircases and hoists extend to the top floors, they must have a glass roof protected externally with strong wire-work, and the enclosing walls must be carried through and 18in. above the roof of the building.*

In factories and workshops in the area controlled by the London County Council a glass roof protected as above is only to be provided in cases where the enclosing walls and staircases are carried through and 18in. above the roof of the building, and also above the roof of the adjoining premises. Otherwise the roof must comply with the requirements of the London County Council.

(*c*) Belting and rope races enclosed as for staircases and hoists.

Shafting through Walls.

19. Shafting where passing through walls to fit closely into wall, or have wall-boxes closed with iron plates not less that ¼in. thick, leaving no open space.

Pipes and Electric Conductors.

20. All pipes in the building, except water-pipes not exceeding 1½in. in diameter, to be of hard metal. No wooden casing to be used for enclosing electric conductors.

Communicating Compartments.

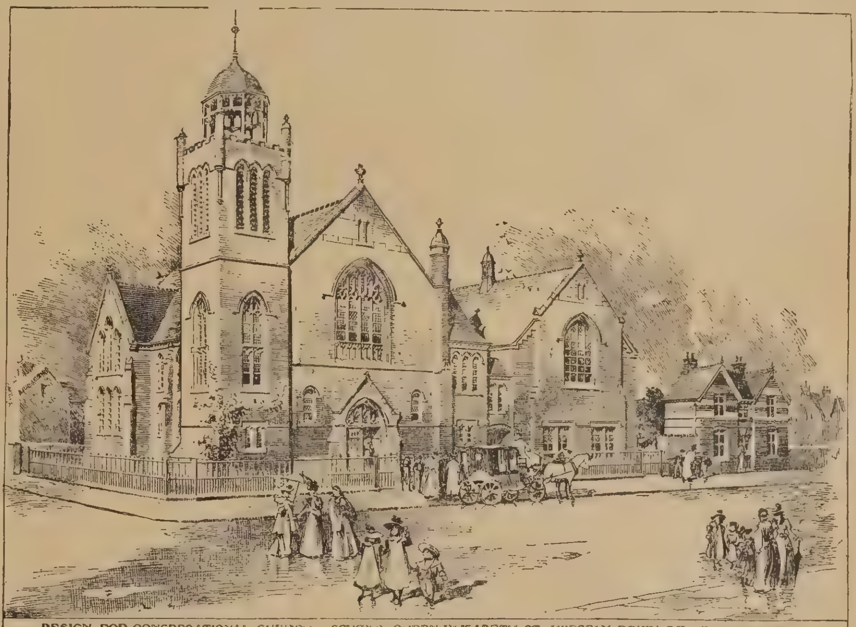
21. Two or more compartments, each constructed in accordance with these Rules, may communicate whether by double "fireproof" doors or otherwise, provided that their aggregate cubical contents do not exceed 60,000 cub. ft.

22. Two or more such compartments, whose aggregate cubical contents exceed 60,000 cub. ft., can only be allowed to communicate across a "fireproof" compartment, built up from the basement with walls of solid brickwork, and constructed in all other respects in accordance with these Rules so far as the same are applicable, and having all openings protected by "fireproof" doors at least 6ft. apart.

23. Except as above, no communication allowed between a compartment constructed in accordance with these Rules and any other building or compartment.

A SOUTHWARK CONGREGATIONAL CHAPEL.

A NEW Union Congregational Church and Schools, now in course of erection on the southern side of the Tower Bridge, will take the place of the old buildings in Parish Street, Horselydown, S.E., acquired by the South-Eastern and Chatham Railway Company in connection with the widening of their lines. The new buildings consist of two blocks, one comprising the church, with ground floor and galleries, and an orchestra behind the rostrum; also minister's vestry, choir vestry, deacon's vestry, lavatories, &c., and organ-chamber. This block is placed at the junction of Queen Elizabeth Street and Horselydown Lane, and has a tower at the corner 12ft. sq., terminating with four corner octagon pinnacles with ogee terminals, and an oak cupola, with ogee top, covered with lead, and wrought-iron terminal, the whole rising to a height of about 70ft. The walls are of brick with stone dressings, and the interior of the church will be fitted up with pitch-pine. The roof will be partially open, the timbers being arched and the ceiling of pitch-pine. The rostrum will also be of pitch-pine. The school block will consist of assembly-room and five classrooms. The church will accommodate 490 adults, or a mixed congregation of 625 persons, and the school block 400 children. Both blocks are connected at front and rear by lobbies and staircases. There is also included in the scheme a caretaker's lodge. The cost of the work is about £6,700, but with cost of site, &c, the gross total will be £10,950. The architect is Mr. John Wills, F.S.Sc., of Derby and London, and the contractors Messrs. Battley, Sons & Holness, of Old Kent Road, S.E. The illustration on this page has been kindly lent us by Mr. George Reeve, the secretary to the trustees and deacons of the church.



DESIGN FOR CONGREGATIONAL CHURCH & SCHOOLS QUEEN ELIZABETH ST HORSELY DOWN SE

JOHN WILLS F.S.Sc. ARCHITECT DERBY & LONDON

Builders' Notes.

Mr. James J. Bickerton, painter and decorator, of Alnwick, died recently.

Mr. T. Huntington, builder and contractor, of Mexborough, died last week.

Mr. Stephen England, builder and contractor, of St. Annes, died recently at the age of sixty-seven years.

Mr. Peter Cunningham, of Dunbar, died recently. He was a partner of the late firm of P. & G. Cunningham, builders.

Mr. E. Pinnell, builder and contractor, of Wotton-under-Edge, died recently at the age of ninety-two years. He retired from business about sixteen years ago.

Mr. John Noy Trounson, manager of the Penzance Gas Works, and an architect and builder, died last week at the age of eighty-four years.

Builders' Bankruptcies.—In the Bankruptcy Court last week the public examination of W. H. Gibbs, builder, surveyor and estate agent, of West Kensington and Fulham, was held. Debtor returned his gross liabilities at £245,113 (of which £21,651 are unsecured) and assets showing a surplus of £48,246. The examination was adjourned.—In the same Court W. G. Hornsey, a builder, of West Ham, applied to pass on accounts showing gross liabilities £128,022 (of which £10,515 are unsecured) and assets showing a surplus of £55,027. The examination was adjourned.—A meeting of the creditors of C. L. Schofield, builder, of Oldham, was held last week in the Official Receiver's office. The statement of affairs showed gross liabilities £25,200, amount expected to rank as dividend £1,842, and assets estimated to produce £2,332.

The Builders' Foremen's Association held its eighth annual dinner at the Holborn Restaurant on Saturday evening last. There were over 200 persons present, and the chair was occupied by Mr. G. Cakebread. In replying to a toast, the president, Mr. H. J. Strong, said the Association was formed nine years ago in a small way, but now numbered over ninety members. Its objects were to promote the interests of those engaged in the control and supervision of building and kindred works by providing a central place where meetings and discussions could take place from time to time on matters of interest to the building and allied trades. There was a benevolent fund for members in need, and £10 was paid on the death of a member. Since its foundation over £100 had been paid in benevolent grants, and the invested funds were now over £160. The monthly subscription was 2s. 3d. A musical programme was rendered during the evening. The secretary of the Association is Mr. W. Cook, 42, Amwell Street, E.C., who will furnish all particulars.

Keystones.

The Queen Victoria Memorial Fund now amounts to about £187,000.

The Sir John Cass Technical Institute, Aldgate, was opened last week.

A Bust of Sir Frederick Bramwell, by the late Mr. Onslow Ford, has been placed in the Royal Institution, Albemarle Street, W.

Mile End Public Library.—The Stepney Borough Council have had the hall of the vestry of Mile End Old Town in Bancroft Road opened as a free public library. The whole of the hall on the first floor is arranged as a reading-room.

Dalham Hall, near Newmarket, has been purchased by Mr. Cecil Rhodes. The hall is an imposing structure in the Georgian style, and was erected in 1704. Messrs. Maple have now a staff of workmen engaged in fitting up a suite of rooms at the mansion. The extent of the Dalham estate is about 3,500 acres.

R.I.B.A. Colonial Examination.—The Royal Institute of British Architects have decided to hold an examination in Melbourne from July 4th to 10th next to qualify for candidature as Associate of the Institute. They have appointed Mr. G. C. Inskip, F.R.I.B.A., and Mr. Ponkden, A.R.I.B.A., of Melbourne, as the Examining Committee.

Belfast Building By-laws.—The Ulster Society of Architects has made objection to the Belfast Corporation against the proposed building clause of the new Bill referred to on p. 343 of our issue for January 1st, but the Corporation have refused to alter the clause. Sir Samuel Black explained that the clause as it stands is intended to secure uniformity in the height of buildings.

A "**King Edward VII. Home for Nurses**" is to be erected adjoining the main building of the North Staffordshire Infirmary at Stoke-on-Trent. The building is to accommodate fifty nurses, and is to be joined to the Infirmary by a covered way. It is intended as a memorial of the Coronation year of the King, who, with his Consort, as Prince and Princess of Wales, laid the foundation-stone of the main building of the Infirmary in 1866. The cost is estimated at £10,000.

The Local Government Annual, 1902.—Several additions have been made to the eleventh issue of this book, which is indispensable to all engaged in local government affairs. The names of committee chairmen in the Metropolitan boroughs, and the chairmen and vice-chairmen of the London County Council committees, are given for the first time. There is also much new and useful information relating to the public libraries, baths and washhouses, and electric light undertakings in the boroughs of London, and the abstract of the Local Government legislation of 1901 cannot fail to be of service. The book is published at 2, Dorset Street, Fleet Street, E.C., price 1s. 6d.

Excavations in Greece.—At the Royal Institution last Thursday Dr. A. S. Murray, of the British Museum, began a series of three lectures on "Recent Excavations at Delphi and in the Greek Islands." His first lecture dealt with the French excavations at Delphi, which had now been laid almost bare, the plan showing a sacred way winding up to a temple at the summit. Along this way were a number of small buildings, called "treasuries." Of the Temple of Apollo little besides the stylobate remained, which however allowed the plan to be traced. The fragments found hardly allowed the "Order" to be formed. The most important remains found were of the Treasury of Cnidos, a small building less than 30ft. square, which had a finely-sculptured frieze. In place of columns two caryatid figures were used on the front; but although these were far from being so refined as the later sculptures of the Erectheum at Athens, they were their prototypes. Archaic sculptures from the Treasuries of Athens and Sicyon, on the sacred way, were also shown, and Dr. Murray drew the conclusion that the art of sculpture was in the sixth century B.C. trammelled by conventionalism, but the sculptors, as the poets, of that date were possessed of originality, which made it possible for the sculptors of a later date, by revising and improving, to produce their masterpieces.

At Victoria Hospital, Burnley, an operating theatre has been built at a cost of over £1,000.

New National Schools at Winslow, Bucks, have been opened at a cost of £2,700.

Mr. Joseph Toone, architect, of Leicester, died last week at the age of fifty-seven years.

The City boundary on the Embankment is to be marked by the erection of a bust of Queen Victoria, sculptured in relief, on a pediment, like that on which the Griffin at Temple Bar now stands.

Eton College Chapel is to be restored by Messrs. Wheeler, of Reading, who will repair the stone mullions and effect re-leading where necessary of the great stained-glass window on the north side of the choir.

A new Post-Office for Pudsey is to be built by Mr. E. Walker, of Armley, the owner of the site, in the centre of the town on the Waver Green Estate, adjoining the Market Place and the Municipal Offices, the Post-Office authorities taking it on a long lease.

Belfast Mill Floor Collapse.—At the moment of going to press we learn of the collapse of the fourth floor in the mill premises of the Smithfield Flax Spinning and Weaving Co., Belfast. This, it is stated, gave way without the slightest warning, a large quantity of machines cutting through the lower floors to the very bottom and burying the workers. It seems that this terrible catastrophe was caused by overloading, to the dangers of which we drew attention only last week.

Mansfield Parish Church, in order to provide for the largely increased congregations, is to be enlarged from plans by Mr. C. Hodgson Fowler, F.S.A. It is estimated that the provision of an organ-chamber, with the requisite attention to the chapel now largely occupied by the instrument, will cost between £600 and £700. The chamber will be erected on lines which will enable it to form an integral part of a more ambitious scheme, should the further extension of the church be decided upon at some future date. Both side chapels will thus be utilised by members of the congregation.

A Congress of the Sanitary Institute will be held at Manchester on September 9th-13th, 1902. The Right Hon. the Earl Egerton of Tatton will be the president. Section I.—Sanitary Science and Preventive Medicine—will be presided over by Sir J. Crichton Browne, M.D., LL.D., F.R.S., F.R.S.E. Section II.—Engineering and Architecture—will be presided over by Sir Alexander Binnie, M.Inst.C.E. Section III.—Physics, Chemistry and Biology—will be presided over by Prof. A. Sheridan Delépine, M.B., C.M., B.Sc. Eight technical conferences will also be held in connection with the Congress.

A New Street at Perth is being formed between South Street and High Street. The first block or feu has been taken for premises to be erected for Messrs. Stewart & Dick, wholesale provision merchants and commission agents. The elevations are to be of red stone. Mr. David Smart, of Perth, High Street, is the architect. The contractors for the work are:—Mason, Robert Brand & Son; joiner, Hay & Sim; slater, James Buchan & Son; plumber, James MacLeish (all of Perth); and plasterer, Alexander M'Ritchie, Dundee; while the steel beams are to be provided by P. & W. MacLennan & Co., of Glasgow.

Architects and Commercialism.—In the course of a lecture delivered last Wednesday at the Manchester City Art Gallery, Mr. J. E. Phythian, president of the Manchester Ruskin Society, referred to the lecture recently delivered at Owens College by Mr. Reginald Blomfield on "Municipalities and Architecture" (reported in our issue for December 18th last). Mr. Phythian said that Mr. Blomfield had blamed commercialism for the lack of appreciation of architecture by the average man, and for the hideousness that surrounded us; but he (the speaker) asked whether artists were not themselves to blame for commercialism to some extent? Mr. Blomfield had tried to prove that Ruskin was an untrustworthy guide with respect to architecture, but his method of proof was mere depreciation and inaccurate statement. It was certain that the Gothic revival was brought about not in obedience to a purely literary sentiment, but from a distinct love of the forms of Gothic architecture.

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THE MANAGER, BUILDERS' JOURNAL
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Jan.	23	Bolton, Lancs—Retort and Fireclay Goods	Gas and Lighting Committee	W. Walch, Office Superintendent, Gas Offices, Bolton.
„	23	Salford—Firebricks, Retorts, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
„	23	Hull—Extension of Electric Light Works	Corporation	T. G. Milner, City Engineer, Town Hall, Hull.
„	23	London, E.C.—Builders' Materials, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„	24	Norwich—Enlargement of Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, Westminster.
„	24	Aston Manor, Birmingham—Buildings	Urban District Council	G. H. Jack, Engineer, Council House, Albert Road, Aston Manor.
„	24	Raunds, Northants—Conservative Club	—	T. Brown & Fisher, Architects, Wellingborough.
„	24	Ballysillan—Cottages	Victoria Homes Committee	Mr. Hunter, Scottish Provident Buildings, Belfast.
„	24	Bradford—12 Houses and 2 Shops	—	J. W. C. Atkinson, 1 Ivegate, Bradford.
„	25	Ebbw Vale, Mon—House	Primitive Methodists Trustees	H. Waters, Architect, Beaufort.
„	25	Llwynypia, Wales—Twelve Houses	Pontrhondda Building Club	W. C. Pritchard, Secretary, Glamorgan Offices, Llwynypia.
„	15	Queenstown, co. Cork—Schools	Most Rev. Dr. Browne	S. F. Hynes, 21 South Mall, Cork.
„	25	Worsborough Bridge, near Barnsley—Villa Residence	—	Senior & Clegg, 15 Regent Street, Barnsley.
„	25	Ystalyfera, Wales—Alterations, &c. to County School	Glamorgan County Council	W. W. Williams, 63 Wind Street, Swansea.
„	25	Leigh, Lancs—Fireclay, Retorts and Bricks	Gas Committee	J. Foster, Manager, Gasworks, Leigh.
„	25	Hartlepool—Electric Generating Station	Corporation	C. Robson, Borough Accountant, Town Hall, Hartlepool.
„	25	Athenry, co. Galway—Five Houses	—	J. G. Skipton, Architect, Northgate Street, Athlone.
„	27	Liverpool—Public Baths	Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool.
„	27	Hastings—Galleries in Electric Light Station	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
„	27	Hexham—Masonry and Brick Road Bridge	Northumberland County Council	J. A. Bean, County Surveyor, Moot Hall, Newcastle.
„	27	Kirkcaldy—Tramcar Depôt	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„	27	Stratford-upon-Avon—Cowhouse and Pigstyes	Corporation	R. Dixon, Borough Surveyor, Municipal Offices, Sheep Street, Stratford-on-Avon.
„	27	Bradford—Church	Primitive Methodists	T. E. Davidson, 14 Neville Street, Newcastle-on-Tyne.
„	27	Bishop Auckland—Church, Schools and Vestries	Primitive Methodists	T. E. Davidson, 14 Neville Street, Newcastle-on-Tyne.
„	28	Beeston—Stables and 2 Houses	W. L. Ingle	T. A. Buttery and S. B. Birds, Architects, Albion Walk Chambers, Leeds.
„	28	Bamford, near Sheffield—Lodge, Stables, Engine House, &c.	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford, via Sheffield.
„	28	Guildford—Reparations and Alterations of Tenements and Farm Buildings.	Rural District Council	E. L. Lunn, 36 High Street, Guildford.
„	28	Nantwich—Technical Institute	Urban District Council	C. E. Davenport, Architect, Nantwich.
„	29	London, S.W.—Carpenters' Works and Goods	Chelsea Borough Council	T. W. E. Higgings, Borough Surveyor, Town Hall, King's Road, Chelsea, S.W.
„	29	Haverhill, Suffolk—House, Offices, and Stores	Greene, King & Sons, Ltd.	A. A. Hunt, Architect, Sudbury.
„	29	Hull—Wagon Repairing Shops, &c.	North-Eastern Railway Co.	W. Bell, Company's Architect, York.
„	29	Pegswood, Northumberland—Passenger Station and House.	North-Eastern Railway Co.	W. Bell, Company's Architect, York.
„	29	St. Agnes, Cornwall—Cloakroom at School	School Board	Carder & Carder, 4 Princes Street, Truro.
„	29	Merthyr Tydfil—School, &c.	School Board	J. Ll. Smith, 50 High Street, Merthyr.
„	29	Blackpool—Station	Lancs. & Yorks. & L. & N. W. Rlys.	Engineer, Lancs. and Yorks. Railway, Hunt's Bank, Manchester.
„	29	Hull—Synagogue and Schools	—	B. S. Jacobs, Architect, Bowlalley Lane, Hull.
„	30	Bristol—Enlargements of Sessional Courts and Offices	Council	H. Williams, Architect, Imperial Chambers, Corn Street, Bristol.
„	30	Styal, Cheshire—Cottage Homes	Chorlton Union Guardians	J. B. Broadbent, 15 Cooper Street, Manchester.
„	31	Penygraig, Wales—School	Ystradfellte School Board	T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.
„	31	Westport—Alterations to Town Hall	Committee of Management	E. J. Gallagher, Secretary to Committee, Westport.
„	31	Salford—Central Fire Station	—	H. Kirkley, 134 Deansgate Manchester.
Feb.	1	New Mills—Infirmary	Hatfield Union Guardians	Garlick & Flint, 5 Terrace Road, Buxton.
„	1	Glasgow—Hospital	Parish Council	D. Wilkie & Son, 53 Bothwell Street, Glasgow.
„	1	Wrexham—Caretakers' Houses	Town Council	Borough Surveyor, Guildhall, Wrexham.
„	3	Merthyr Tydfil—100 Houses	Urban District Council	Council's Surveyor, Town Hall, Merthyr.
„	3	Ballinamallard—Methodist Church and Residence	—	T. J. Crozier, Ballinamallard.
„	3	Shenfield, Essex—Cowbyre and Farmhouse	—	L. H. Marshall, Surveyor, Chippenham.
„	4	London, N.—Extension of Electric Lighting Station	Shoreditch Borough Council	J. R. Dixon, Engineer, Town Hall, Old Street, E.C.
		ENGINEERING:		
Jan.	23	Hull—Steelwork for Electric Light Works Extension	Corporation	T. G. Milner, City Engineer, Town Hall, Hull.
„	24	Clonmel, Ireland—Drainage Works, Water and Fire Mains, &c.	Workhouse Guardians	T. Beary, Clerk, Boardroom, Clonmel Union.
„	24	Barking, Essex—Electrical Generating Plant	Urban District Council	Engineer, Electricity Works, East Street, Barking.
„	25	Hartlepool—Electrical Plant, &c.	Corporation	C. Robson, Borough Accountant, Town Hall, Hartlepool.
„	25	Rugby—Cleaning Out, &c., Mill Dam	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
„	25	Hull—Railway Siding	Corporation	F. J. Bancroft, City Engineer, Alfred Gelder Street, Hull.
„	27	Ilford—Electrical Stores, &c.	Urban District Council	J. W. Benton, Clerk, Council Offices, Ilford.
„	27	Lochgelly, Scotland—Waterworks	Magistrates and Town Council	Buchanan & Bennett, 12 Hill Street, Edinburgh.
„	27	Pontypridd—Sulphate of Ammonia Plant	Gas Committee	E. Jones, Gas Engineer, Gas Offices, Treforest.
„	27	Gretna, Beattock and Crawford—Superstructure of Underbridges.	Caledonian Railway Company	Company's Divisional Engineer, Princes Street Station, Edinburgh.
„	27	Madrid—Electric Tramway Concession	Spanish Ministry of Public Works	Commercial Department, Foreign Office, S.W.
„	27	Shipley, Yorks—Tramways	Urban District Council	R. C. Quin, Consulting Electrical Engineer, Electricity Works, Blackpool.
„	27	Warden, Hexham—Masonry and Brick Road Bridge	Northumberland County Council	J. A. Bean, County Surveyor, Moot Hall, Newcastle.
„	27	Dundee—Main Sewer	Town Council	W. Mackison, 91 Commercial Street, Dundee.
„	27	Natland, Westmorland—Waterworks	South Westmorland Rural District Council.	W. Harrison, 1 Hind Street, Preston.
„	27	Epsom—Fire House and Fittings at Asylum	London County Council	R. W. Partridge, 6 Waterloo Place, S.W.
„	28	Manchester—Elevators and Conveyors for Coal and Ashes.	Electricity Committee	F. E. Hughes, Secretary, Town Hall, Manchester.
„	28	Little Ilford—Extension of Water-Mains, &c.	City of London Burial Board	Engineer to Corporation, Guildhall, E.C.
„	29	Amsterdam—Metal Superstructure for 4 Bridges, &c.	Netherlands Colonial Minister	Commercial Department, Foreign Office, S.W.
„	29	Liverpool—Electric Generators, &c.	South Lancs Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
„	29	West Bromwich—Electric Plant	Corporation	J. H. Wray, Electricity Works, Black Lane, West Bromwich.
„	30	Meltham, Yorks—Sewage Purification Works	Urban District Council	J. B. Abbey & Son, 34A New Street, Huddersfield.
„	31	Purleigh, Essex—Small Bridge	Essex County Council	P. J. Sheldon, Chief Surveyor, County Offices, Duke St., Chelmsford
„	31	Chelmsford—Oil Engine	Rural District Council	J. Dewhirst, Engineer, Avenue Chambers, Chelmsford.
„	31	Johannesburg—Carburetted Water and Gas Plant	—	Crown Agents for the Colonies, Downing Street, London.
„	31	Paignton—Waterworks	Urban District Council	F. W. Vanistone, Engineer, Palace Chambers, Paignton.
Feb.	1	Gwyrfai, Wales—Waterworks	Rural District Council	E. Evans, 8 Castle Street, Carnarvon.
„	5	Calcutta—Waste-water Meters	Corporation	F. Gainsford, Secretary to Corporation, Calcutta.
		FURNITURE:		
Jan.	31	Withington, Lancs—Filments and Furniture at Sanatorium.	Urban District Council	J. B. Broadbent, 15 Cooper Street, Manchester.
Feb.	5	Sunderland—Furnishing Workhouse Infirmary	Guardians	W. & T. R. Milburn, 20 Fawcett Street, Sunderland.
		IRON AND STEEL:		
Jan.	25	Hull—Cast-iron Pipes and Castings	Corporation	F. J. Bancroft, City Engineer, Alfred Gelder Street, Hull.
„	25	Birmingham—Casting, Iron and Steel Ware, &c.	Public Works Committee	City Surveyor, Council House, Birmingham.
„	25	Blackburn—Wrought-iron Piping, Fittings, &c.	Corporation	Engineer, Electricity Works, Jubilee Street, Blackburn.
„	27	Glasgow—Steelwork for Superstructure of River Bridges.	Caledonian Railway Company	Company's Divisional Engineer, Princes Street Station, Edinburgh.
„	28	London, S.W.—Tramway Rails	London County Council	Clerk, County Hall, Spring Gardens, S.W.
„	30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.
Feb.	3	London, N.W.—Iron Castings, Ironmongery, &c.	Hendon Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
„	4	Market Harborough—Iron Posts and Rails	Urban District Council	Coales & Johnson, Bank Chambers, Market Harborough.
„	15	Plymouth—Ironmongery, Ironwork, Bolts, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
„	10	London, S.E.—Iron, Steel, Ironmongery, Gas Fittings, &c.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
„	10	London, S.W.—Castings, Lamp Columns, Iron, Steel	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth S.W.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	PAINTING AND PLUMBING:		
Jan. 23	London E.C.—Oil, Painters' Colours, &c.	Metropolitan Asylums Board	T. D. Mann Clerk, Board's Offices, Embankment, E.C.
" 24	Christiania—Pitch, Tar, Oil, Brushes, &c.	Intendent of Norwegian Railway	Intendent, Christiania.
" 24	Clonmel, Ireland—Plumbing Work at Workhouse	Guardians	T. Beary, Clerk, Boardroom, Clonmel Union.
" 27	Halifax—Painting Town Hall	Finance Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
" 27	Bolton—Painting, Decorating, &c., Market Hall, &c.	Markets Committee	Borough Engineer, Town Hall, Bolton.
" 29	London, S.W.—Plumbers' and Painters' Work	Chelsea Borough Council	T. W. E. Higgens, Borough Surveyor, Town Hall, London, S.W.
" 30	Manchester—Hot Water System	Prestwich Union Guardians	Mr. Chambers, Workhouse Master, Delanney's Road, Crumpsall.
Feb. 3	Manchester—Painting (10 Contracts)	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester
" 3	Stafford—Cleansing, Distempering & Painting Markets	Markets and Tolls Committee	W. Blackshaw, Borough Hall, Stafford.
" 5	King's Lynn—Plumbers' Work	Corporation	Borough Surveyor, Town Hall, King's Lynn.
" 7	Kirkcaldy—Plumbers' Work at Tramcar Depôt	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
" 10	London, S.W.—Painters' Materials	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 11	London, S.E.—White and Red Leads, Painters' Sundries.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
" 12	Stratford, E.—Painting, Graining, &c. at Court House	Essex County Council	F. Whitmore, County Architect, Shire Hall, Chelmsford.
" 15	Plymouth—Paint, Glass, Brushes, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
	ROADS AND CARTAGE:		
Jan. 23	Dundee—Whinstone Sets	Town Council	W. Mackison, 91 Commercial Street, Dundee.
" 23	Sleaford, Lincs—Granite and Slag	Rural District Council	E. Clements, 74 Southgate, Sleaford.
" 23	Brigg, Lancs—Granite and Slag	Rural District Council	F. O. Hett, Clerk, Brigg.
" 23	Willenhall—Paving	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
" 23	London, N.E.—Road-making, Kerbing, &c.	Hackney Borough Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney.
" 23	Meridan, Coventry—Granite for Highways	Rural District Council	A. Seymour, 11 Priory Street, Coventry.
" 23	Barnstaple—Roads, Footpaths, &c.	Corporation	J. Bosson, Borough Surveyor, Barnstaple.
" 24	Hull—Street Works	Corporation	A. E. White, City Engineer, Town Hall, Hull.
" 25	Alderley Edge, Manchester—Making-up Street	Urban District Council	H. Sheldon, Surveyor Alderley Edge.
" 25	Birmingham—Materials	Public Works Committee	City Surveyor, Council House, Birmingham.
" 25	Hailsham, Sussex—Road Materials	Rural District Council	E. Catt, 17 London Road, Hailsham.
" 26	Lancaster—Forming, &c., Roads	Streets Committee	Borough Surveyor, Town Hall, Lancaster.
" 27	Bridgwater—Road Stone	Rural District Council	T. M. Reed, Clerk, Bridgwater.
" 27	Guildford—Making-up	Rural District Council	J. Anstee, Surveyor, Commercial Road, Guildford.
" 27	Sale, Cheshire—Materials	Urban District Council	J. A. Angel, Surveyor to Council, Beckenham
" 27	Beckenham—Making-up Roads	Urban District Council	Surveyor, District Council Offices, Bromley, Kent.
" 28	Bromley—Widening Roads	Urban District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
" 28	London, N.W.—Road Making and Paving Works	Willesden District Council	W. Holt, Surveyor, Council Offices, Sale.
" 28	Croydon—Road Repair	—	Borough Road Surveyor, Town Hall, Croydon.
" 28	Felixstowe—Making-up Road	Urban District Council	Surveyor, Town Hall Felixstowe.
" 29	London, S.W.—Materials	Chelsea Borough Council	T. W. E. Higgens, Borough Surveyor, Town Hall, King's Road, Chelsea, S.W.
" 29	Orsett, Essex—Street Works	Rural District Council	F. Lowry, Engineer, Hornchurch, Essex.
" 30	Reading—Improvement Works	Sanitary Authority	J. Bowen, Borough Surveyor, Town Hall, Reading.
" 31	Aylesbury—Granite	Bucks County Council	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
Feb. 1	Norwich—Granite	Norfolk County Council	T. H. B. Heslop, County Surveyor, Norwich.
" 1	Sleaford, Lancs—Granite	Urban District Council	E. Clements, Clerk, Council Offices, Sleaford.
" 3	Walmer, Kent—New Roads	Walmer Estates Co., Ltd.	Hinds & Son, Estate Agents, Walmer.
" 3	London, N.W.—Materials, Horses and Carts	Hendon Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
" 4	Leyton—Materials, Horse-Hire and Cartage, &c.	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton.
" 4	Rochester—Six Dust Vans	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
	SANITARY;		
Jan. 23	London, E.C.—Disinfectants, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 24	Clonmel—Drainage Works	Guardians	E. A. Hackett, Engineer, Clonmel.
" 25	Birmingham—Drainpipes, Gulleys, &c.	Public Works Committee	City Surveyor, Council House, Birmingham.
" 25	Rugby—Drainage Works	Urban District Council	D. G. Macdonald, Surveyor to Council, Rugby.
" 25	Mundesley, Norfolk—Sewage Works	Erpingham Rural District Council	T. J. Goldie, Engineer, Bank Buildings, Bank Plain, Norwich.
" 27	Hastings—Sanitary Works, &c., at School	School Board	C. A. Pigott, Architect, Saxon Chambers, St. Leonards.
" 27	Dundee—Sewer	Town Council	W. Mackison, 91 Commercial Street, Dundee.
" 27	Warrington—Stoneware and Cast-Iron Pipe Sewers	Paving and Sewage Committee	Borough Surveyor, Town Hall, Warrington.
" 28	Woodbridge, near Guildford—Drainage System	Joint Hospital Board	E. L. Lunn, 36 High Street, Guildford.
" 29	London, S.W.—Scavenging, Barging away Slop, Brooms, &c.	Chelsea Borough Council	T. W. E. Higgens, Borough Surveyor, Town Hall, King's Road, Chelsea, S.W.
" 30	Meltham, Yorks—Sewage Purification Works	Urban District Council	C. H. Marriott, Son & Shaw, Civil Engineers, Church Street Chambers, Dewsbury.
Feb. 1	Silkstone, Penistone, Yorks—Drainage Works	Rural District Council	T. W. A. Hayward, Borough Surveyor, Town Hall, Sudbury.
" 3	London, N.W.—Scavenging, House-Drainage, Disinfectants, &c.	Hendon Urban District Council	J. B. Abbey & Son, 34A New Street, Huddersfield. S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
" 3	Walmer, Kent—12in. Sewers	Walmer Estates Co., Ltd.	
" 8	Sudbury, Suffolk—Sewerage Works	Corporation	Hinds & Son, Estate Agents, Walmer.
" 10	London, S.W.—Stoneware Pipes, Drain Testers, Disinfectants, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 15	Plymouth—Brooms, Disinfectants, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 17	Stamford, Lincs—Sewers, &c.	Corporation	J. B. Everard, 6 Millstone Lane, Leicester.
	TIMBER:		
Jan. 23	Bramley, Surrey—Park Pale Fencing	Hambledon Rural District Council	E. L. Lunn, 36 High Street, Guildford.
" 23	London, E.C.—Timber, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment E.C.
" 23	Plymouth—Timber, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
" 25	Birmingham—Timber	Public Works Committee	City Surveyor, Council House, Birmingham.
Feb. 10	London, S.W.—Timber	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 31	Bangor—Infants' School [Local Architects Only]	——	A. C. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
" 31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
" 31	Hull—Art School (cost not to exceed £10,000)	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
" 31	Newport, Isle of Wight—Queen Victoria Memorial	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
" 31	Liverpool—Rebuilding Children's Infirmary [Six Architects to be Selected].	£50 each.	Colonel C. F. Bell, 17 Fenwick Street, Liverpool.
Feb. 1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
" 4	Mountain Ash, Wales—Municipal Offices	£75.	J. Williams, Surveyor to U.D.C., Town Hall, Mountain Ash.
Mar. 1	Aldershot—Laying-out Pleasure Ground	£20, £10, £5.	N. F. Dennis, Surveyor, Urban District Council, Offices Aldershot.
" 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria St., Westminster.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Carlisle—Racecourse Grand Stand, Offices &c.	2nd £10; 3rd £5.	Secretary, Race Stand Co., Ltd., 15 Howard Place, Carlisle.
"	Audenshaw, near Manchester—Cemetery Buildings	——	W. Clough, Surveyor, Urban District Council's Offices, 2 Guide Lane, Audenshaw.

New Companies.

Auckland Park Real Estate, Ltd.

Registered to acquire, by purchase or otherwise, freehold and other land, building sites, farms, grants, concessions, leases, &c., in South Africa, of whatever tenure; to develop the same by the construction (and control) of public works of every description, rail and tramways, docks, harbours, irrigation and sewage works; as producers and suppliers of gas and electricity, &c. Capital £150,000 in £1 shares. Registered office: 23, St. Swithin's Lane, E.C.

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Registered to provide in Birmingham and the neighbourhood clean, comfortable and inexpensive sleeping accommodation for workmen and others, and in connection therewith to afford to such persons facilities and conveniences for washing, bathing, cooking, reading, writing and finding employment, for the purchase and consumption of provisions (both liquid and solid), and for safe custody of goods. Capital £50,000 in £1 shares. Forty-five thousand shares are to be offered to the public. The provisional directors are H. C. Holder, H. Lloyd jun., and J. M. Bayley. The above hold office until a board of five directors shall have been appointed by the provisional committee, consisting of the Right Hon. the Lord Mayor of Birmingham (Alderman J. J. Lloyd, J.P.), His Grace the Duke of Marlborough, Right Hon. Earl Dudley, Right Hon. Earl Howe, Right Hon. Lord Rowton, K.C.V.O., C.B., Right Hon. Lord Windsor, Right Hon. Sir Francis Jeune, K.C.B., Right Hon. Joseph Chamberlain, M.P., Sir R. Farrant, Sir J. Holder, Bart., Alderman W. Cook, J.P., Alderman Samuel Edwards, J.P., W. B. Cregoe-Colmore, A. M. Chance, J.P., George Cadbury, J.P., H. Lloyd, A. W. Still, J.P., T. F. Chavasse, M.D., J.P., J. Barrows, J.P., A. H. Carter, M.D., J. Phillips, J.P., W. L. Powell, J.P., J. W. Lea and W. J. Lancaster, J.P.

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Registered to carry on the business of land, property and security owners and dealers, builders, brick-makers, financiers, &c. Capital £12,000 in £1 shares.

Pyrazote Syndicate, Ltd.

Registered to adopt an agreement with E. Glasse, being an assignment to the syndicate of his interest in an agreement dated December 10th, 1901, between the said E. Glasse and L. Loewenthal, and to carry on the business of manufacturers of and dealers in fire-extinguishing apparatus (including the gas and all other the subject-matter of the patents and inventions of the said L. Loewenthal), &c. Capital £15,000 in £1 shares. The first directors are L. Loewenthal (permanent) and E. Glasse (permanent managing director).

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BRENTWOOD (ESSEX).—For the construction of proposed new sewage tanks, filter beds, engine house, and other appurtenant works at Brentwood sewage works, for the Billericay Rural District Council and Brentwood Urban District Council (Joint Committee). Messrs. Jones, engineers, Parliament Mansions, Westminster, S.W.:—

Pedrette, Clapton	£3,987
Gibb & Co., London	3,667
Neave & Son, Paddington	3,536
Bell, Tottenham	3,221
Jackson, Forest Gate	3,000
Cunliffe, Kingston	2,893
C. Ford, Harlesden	2,830
Coxhead, Leytonstone	2,600
Wilson-Border, Ilford	2,502
Wheeler, London, S.E.	2,477
Felkin & Watson, Southall	2,450
Harris & Row,* Shoeburyness	2,271

* Accepted.

CARDIFF.—For the masonry of abutments, retaining walls, &c., required for (1) widening the Hayes Bridge; (2) widening of the North Road Bridge; (3) reconstruction of the East Wharf Bridge, for the Corporation. Mr. W. Harpur, M.I.C.E., borough engineer:—

F. Ashley, Conway Road	£5,026	1	7
J. Allan & Sons, Cathays	4,805	4	3
Lattey & Co., Ltd., Llanishen Street	4,678	10	8
E. Turner & Sons, Penarth Road	4,484	0	1
D. W. Davies, Wade Street	3,824	0	0
W. T. Morgan, Fair Oak Road	3,760	13	8
C. Davies,* Court Road	3,576	3	5

* Accepted.

CHINGFORD.—For the remainder of roads and sewers on the Rowden Park Estate, Chingford. Mr. T. Wilson, surveyor, 24 New Bridge Street, E.C.:—

French	£3,977
Rogers & Co.	3,944
Neave & Co.	3,785
Killingback & Co.	3,682
Eli Wilson,* Walthamstow	3,508

* Accepted.

DERBY.—For enlargement of Derby head post office, for H.M. Office of Works, &c.:—

				†
J. W. Smith	£5,087	0	0	£50
J. Cooper & Son, Nottingham, Ltd.	4,175	0	0	35
R. M. Hughes	3,791	0	0	130
Walker & Slater	3,678	0	0	79
R. C. Greaves	3,655	0	0	50
Ford & Co.	3,764	16	0	52
J. H. Williamson*	3,613	0	0	75

* Accepted. † Allowance for old materials.

ENFIELD (MIDDLESEX).—For making-up Catisfield Road, Enfield Lock, for the Enfield Urban District Council. Mr. Richard Collins, surveyor:

W. Griffiths & Co., Bishopsgate	£1,383	14	2
C. Bloomfield, Tottenham	1,162	0	0
Adams, Wood Green	1,137	15	7
F. J. Betts,* Enfield Highway	1,095	0	0

* Accepted.

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HOLYHEAD.—For the erection of an infant school at Kingsland, for the Holyhead School Board :—

Williams & Sons, Tonyrefail, Holyhead	£1,450
E. R. & J. Owen,* London House, Holyhead	1,074

* Accepted.

LONDON, E.C.—For the erection of Baptist Church House, Southampton Row, Holborn, W.C. Mr. Arthur Keen, architect, 4 Raymond Buildings, London, W.C. Messrs. Boreham & Norton, quantity surveyors, 24 John Street, Sunderland :—

Lawrence & Sons	£36,750	Holloway Bros.*	£33,890
Simpson	36,304	Holliday & Greenwood	33,545
Colls & Son	35,140	Higgs & Hill*	32,818
Hall Bedall	34,820	Turtle & Appleton	32,700
Dove Bros.	34,251		

Plumber, painter, and glazier.

Simpson	£2,988	Turtle & Appleton	£2,800
Holloway Bros.	2,844	Higgs & Hill*	2,484
Holliday & Greenwood	2,840		

* Accepted.

LONDON, N.W.—For rendering watertight the men's first-class and the ladies' first-class swimming-baths at the Hampstead Public Baths, 175 Finchley Road, N.W., for the Hampstead Borough Council. Mr. O. E. Winter, A.M.I.C.E., borough engineer :—

C. Ford, Harlesden	£1,891	0
Drake & Son, Hampstead	1,799	0
H. B. Oldrey & Son,* Kilburn	1,625	15

* Accepted.

LONDON, S.E.—For making sundry alterations and additions at Ashburton House, Beckenham Road, Penge; and erecting billiard saloon and lecture hall in rear :—

Coffin & Son, Eaton Square, W.	£1,447	0
W. Keys, Tooting	1,322	0
W. Wallis, Balham	1,560	0
Turtle & Appleton, St. John's Hill	1,548	0
Heathfield,* Beckenham	1,211	5
W. Pearce, Thornton Heath (amended)	1,156	10

* Amended and accepted.

LONDON, S.W.—For the erection of the superstructure of the Royal College of Science, South Kensington, for Commissioners of H.M. Works and Public Buildings :—

Stephens, Bastow & Co., Ltd.	£224,000	Perry & Co.	189,300
G. Trollope & Son	209,757	McCormick & Sons	185,581
J. Mowlem & Co.	199,102	Leslie & Co., Ltd.	175,678
J. Shillitoe & Son	191,000	H. Lovatt	175,540

LONDON, S.W.—For the erection of a sub-district post office at West Kensington, for the Commissioners of H.M. Works and Public Buildings :—

		*
J. Appleby	£19,300	£25
Maple & Co., Ltd.	19,929	—
Spiers & Son	18,670	25
Wilson Bros. & Lamplough	18,390	50
J. Norris & Sons	18,340	50
General Builders, Ltd.	17,997	100
J. Mowlem & Co.	17,979	—
Martin, Wells & Co., Ltd.	17,309	10
Kirk & Randall	16,996	30
J. F. Robey	16,980	25
T. E. Mitchell	16,950	—
W. Norton	16,835	20
J. Christie	16,640	—
Sabey & Son	16,451	20
F. G. Minter	16,300	—
A. W. Spencer	16,175	23
W. H. Lorden & Son	16,000	—
J. Simpson & Son	15,977	23
H. L. Holloway	15,800	30
Hobbs Bros.	15,680	35
Campbell, Smith & Co., Ltd.	13,287	100
Braid, Pater & Co.	12,737	180

* Old materials.

MARKET HARBOROUGH.—For levelling about six acres of ground for the new cattle market, forming road foundations, laying sewers, water and gas mains, and river widening, for the Market Harborough Urban District Council. Mr. Herbert G. Coales, A.M.I.C.E., engineer and surveyor :—

Contract No. 1.

G. H. Eastwood, Market Harborough	£3,635	0	0
T. Hickman, Little Bowden	3,420	0	0
W. Moss & Sons, Ltd., Loughborough	3,315	15	0
C. Ford, Harlesden	3,289	0	0
Haycock & Sons, Great Glenn	3,081	2	7
S. E. Lucas, East Leake	2,992	0	0
Johnson & Langley, Leicester	2,966	2	1
F. Barlow, Rothwell	2,873	0	0
A. Jewell, Little Bowden	2,846	10	0
A. Wright, Deenethorpe	2,803	9	7
G. L. Martin, Market Harborough	2,790	0	0
J. C. Wingrove, Northampton	2,631	0	0
G. F. Tomlinson, Derby	2,579	0	0
T. Philbrick,* Leicester	2,540	17	0

* Accepted.

READING.—For the works comprised in specification for Contract No. 3 (construction of buildings in connection with the generating station), for the Corporation :—

J. Norris & Sons, Sunningdale	£27,500	2	9
C. Ansell, Lambeth	26,088	0	0
H. W. Godwin, Reading	26,070	13	7
J. E. Johnson & Son, Leicester	25,867	0	0
F. & H. F. Higgs, Loughborough Junction, London	25,700	0	0
Martin, Wells & Co., Ltd., Aldershot and London	25,687	0	0
F. G. Minter, Westminster	25,450	0	0
A. N. Coles, Stonehouse, Plymouth	25,310	15	3
Collier & Catley, Reading	24,322	0	0
W. Pattinson & Sons, Westminster	23,975	0	0
T. H. Kingerlee & Sons, Oxford	23,727	0	0
Patman & Fotheringham, Ltd., Islington	23,456	0	0
McCarthy E. Fitt, Reading	22,695	0	0
A. J. Colborne, Swindon	22,213	10	11
A. Faulks,* Loughborough	21,541	0	0

* Accepted.

ST. BUDEAUX (CORNWALL).—For the erection of a school and boundary walls on the site between Honicknowle and Crownhill, for the St. Budeaux School Board. Mr. T. R. Kitsell, architect, 1 George Street, Plymouth :—

Roach & Lovell, Plymouth	£5,388
W. T. Stevenson, Plymouth	4,650
J. Paynter, Plymouth	4,545
W. J. Goad, Portland Square, Plymouth	4,477
W. E. Blake, Plymouth	4,373
F. C Ambrose, Plymouth	4,311
A. N. Coles, Plymouth	4,176
G. Hoskin, Lower Compton, Plymouth	4,100
Bennett & Quick, Embankment Road, Plymouth	3,846
Allen & Tozer, St. Budeaux, Plymouth	3,731
A. Andrews, 3 Evelyn Place, Plymouth	3,610
A. J. Jewell, Stoke Devonport	3,535
J. Davy,* Compton, Plymouth	3,450

* Accepted conditionally.

SHEPTON MALLET (SOMERSET).—For providing and laying about 8¾ miles of 3-inch main, and about 2 miles of 2-inch and 1½-inch branches, together with the erection of a hydraulic ram for compensation supply; providing and fixing standposts, valves, services, and fittings, for the Shepton Mallet Rural District Council. Mr. William Phelps, C.E., engineer :—

S. Dodimead, Shepton Mallet	£5,572	17	9
R. A. Crowe, Manchester	5,548	14	5
Wilkins & Son, Bristol	4,624	2	3
H. Sparrow, Martock	4,449	6	5
S. Ambrose, Bath	4,427	7	6
Guppy & Chant, Sherborne	4,234	2	0
Wright & Son, Glastonbury	4,138	10	7
Wills & Son, Bath	4,089	13	8
O. J. Allen, Evercreech	4,058	1	10
H. C. Brixey, Parkstone	3,864	16	7
Smith & Marchant,* Shepton Mallet	3,781	2	0

* Accepted.

COMING EVENTS.

Wednesday, January 22.

RUSKIN SOCIETY OF BIRMINGHAM.—Mrs. Humphry Ward on "Modern Italy," 7.45 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Prof. G. Baldwin Brown on "Some Thoughts on the Dome as an Architectural Form," 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Prof. W. J. Sollas on "Analysis of Rocks," 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Testing Works of Messrs. David Kirkcaldy & Son, 2.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Birmingham Section).—Mr. W. Kingsland on "Surface Contact Systems of Electric Traction."

DEVON AND EXETER ARCHITECTURAL SOCIETY (Plymouth, Devonport and Stonehouse Branch).—Mr. Edmund Sedding, F.R.I.B.A., on "Old Cornish Towers."

Thursday, January 23.

SOCIETY OF ARCHITECTS.—Mr. M. Sullivan on "Early British and Celtic Art," at 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY OF ARTS (Indian Section).—Mr. Francis Henry Skrine on "Bengal: The Land and its People," 4.30 p.m.

ROYAL INSTITUTION.—Dr. A. S. Murray on "Recent Excavations at Delphi and in the Greek Islands"—II., 3 p.m.

ROYAL ACADEMY.—Prof. V. C. Prinsep, R.A., on "Painting"—IV., 4 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Mr. E. B. WEDMORE on "Earth Currents derived from Distributing Systems," 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Dublin Section).—Mr. W. Brew on "Inductive Currents, 7.30 p.m.

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Friday, January 24.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. F. G. W. Buss on "The Clerk of Works, his Duties and Responsibilities," 7.30 p.m.

DEVON AND EXETER ARCHITECTURAL SOCIETY (Plymouth, Devonport and Stonehouse Branch).—Annual Dinner.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. Halsey Ricardo on "The Gothic Revival."

ROYAL INSTITUTION.—Mr. H. G. Wells on "The Discovery of the Future," 9 p m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. James Lockhead, A.R.I.B.A., on "Hospital Planning and Construction," 8 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

Saturday, January 25.

INSTITUTION OF JUNIOR ENGINEERS.—Annual Dinner at Hotel Cecil at 6.30 p.m.

DUNDEE INSTITUTE OF ARCHITECTURE.—Visit to Perth.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Mr. Henry MacEwen on "Large Storage Batteries and their Application to Central Station Supply," 7.30 p.m.

Monday, January 27.

SURVEYORS' INSTITUTION.—Discussion of Mr. A. Dudley Clarke's paper on "The Final Report of the Local Taxation Commission," 8 p.m.

SOCIETY OF ARTS (Cantor Lectures).—Mr. Samuel Rideal, D.Sc., F.I.C., on "Mechanical and Thermal Purification of Water"—III., 8 p.m.

Tuesday, January 28.

INSTITUTION OF CIVIL ENGINEERS.—Mr. Joseph Davis, M.I.C.E., on "The Sewerage Systems of Sydney, N.S.W., and its Suburbs," and Mr. William Naylor, A.M.I.C.E., on "The Bacterial Treatment of Trades Waste," 8 p.m.

ROYAL INSTITUTION.—Dr. Allan Macfadyen on "The Cell"—III., 3 p.m.

SOCIETY OF ARTS (Colonial Section).—Commander B. Whitehouse on "To the Victoria Nyanza by the Uganda Railway," 4.30 p.m.

Wednesday, January 29.

CLERGY AND ARTISTS' ASSOCIATION.—Annual General Meeting at 113 Cromwell Road, at 3.30 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Council Meeting at 6.45 p m. Mr. R. P. S. Twizell, A.R.I.B A., on "The Development of Architectural Ornament," 7.30 p m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p m.

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Straw	do.	1	8	0	2	0	0

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		£	s.	d.	£	s.	d.
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Colza Oil, English ..	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	$4\frac{1}{2}$		—	
Linseed Oil, barrels ..	do	1	9	3	1	9	6
Petroleum, American ..	per gal.	0	0	$6\frac{7}{8}$	0	0	7
Do. Russian ..	do.	0	0	$5\frac{7}{8}$	0	0	$6\frac{1}{8}$
Pitch	per barrel	0	7	0		—	
Shellac, orange	per cwt.	6	2	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	12	0		—	
Tar, Stockholm	per barrel	1	3	0	1	3	6
Turpentine	per cwt.	1	9	6		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	66	0	0		—	
Iron, Staffs., bar ..	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	0	0		—	
Lead, pig, Soft Foreign ..	do.	10	8	9	10	10	0
Do. do. English common brands	do.	10	15	0		—	
Do. sheet, English 3lb per sq. ft. and upwards	do.	11	17	6		—	
Do. pipe	do.	12	5	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	0	0		—	
Do. floor brads	do.	8	15	0		—	
Steel, Staffs., Girders and Angles	do.	5	15	0	6	5	0

METALS—*cont.*

		£	s.	d.	£	s.	d.
Steel, Staffs., Mild bars	per ton	6	15	0	7	5	0
Tin, Foreign	do.	104	10	0	105	0	0
Do. English ingots ..	do.	107	0	0	108	10	0
Zinc, sheets, Silesian ..	do.	21	0	0		—	
Do. do. Vieille Montaigne	do.	21	10	0		—	
Do. Spelter	do.	16	12	6	16	17	6

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		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
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Do. Pitch	do.	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	10
Do. Petersburg ..	per bundle	0	0	9	0	0	$0\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	13	0	0	18	15	0
Do. do. 2nd "	do.	16	0	0		—	
Do. do. White	do.	9	5	0		—	
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea ..	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st ..	do.	27	5	0		—	
Do. do. 2nd ..	do.	12	15	10	13	0	0
Do. do. 3rd &c.	do.	9	10	0		—	
Do. Canadian Spruce, 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	9	12	6		—	
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	2	6	12	5	0
Flooring Boards 1in. prepared, 1st ..	per square	0	10	0		—	
Do. 2nd ..	do.	0	8	9		—	
Do. 3rd &c. ..	do.	0	5	0	0	10	0

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Ash, Quebec	per load	3	17	6	4	10	0
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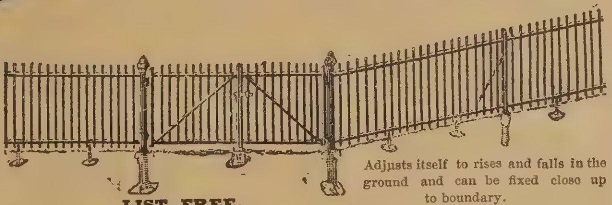
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	$4\frac{5}{32}$		—	
Do. Honduras ..	do.	0	0	$1\frac{3}{4}$		—	
Do. Tobasco	do.	0	0	$3\frac{25}{32}$		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	$4\frac{7}{8}$		—	
Do. African ..	do.	0	0	$3\frac{17}{32}$		—	
Do. St. Domingo	do.	0	0	$5\frac{1}{2}$		—	
Do. Tobasco ..	do.	0	0	4		—	
Do. Cuba ..	do.	0	0	$4\frac{7}{16}$		—	
Oak, Dantzic and Memel	per load	3	15	0	5	7	6



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JAN. 29, 1902.
No. 364.

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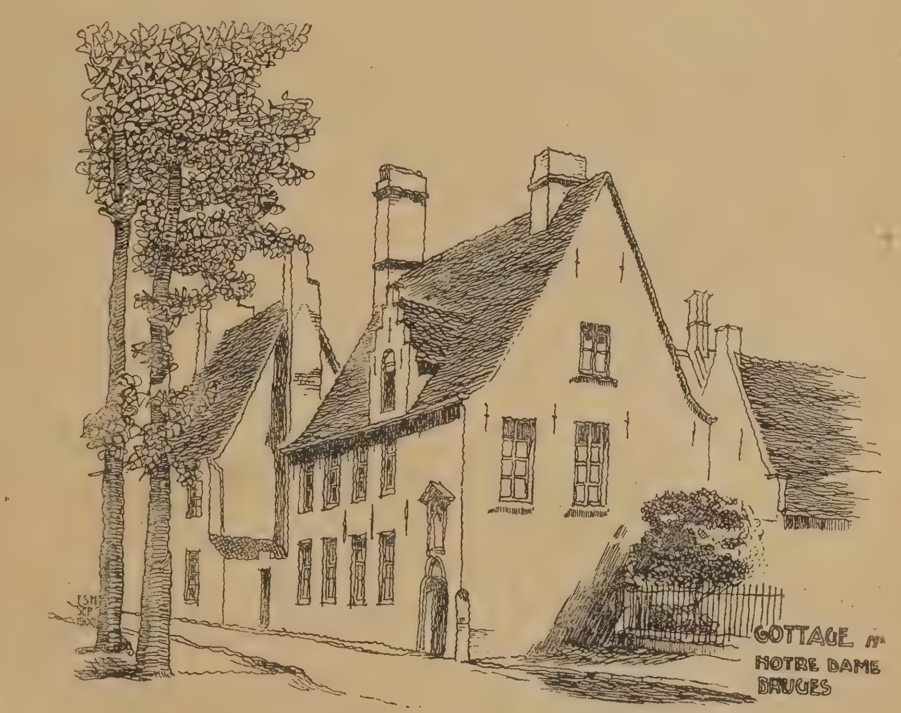
An Architectural Causerie.

Unsafe Buildings. THE cause of the Belfast disaster, which we were able to briefly report in our last issue, has not yet been ascertained, though several conjectures have been made. The managing director of the firm, Mr. Arthur Herdman, repudiates the suggestion that the older portions of the building were unsound, as when extensions were being made to the premises about eight years ago the addition of another storey was contemplated, and after a careful examination it was found that the walls were quite capable of supporting this extra weight. However, as the firm found they would obtain more room by building a new department, the additional storey was not erected. It has been suggested that the regular vibration of the numerous machines employed in the factory set up an accumulated effect which ultimately resulted in this disaster, but such an inference is not logical, as the spinning machines used would not, by their very nature, have the effect suggested. This reflection of the effect of vibrating machinery on building structures is, however, interesting, though it cannot be classed among such examples as that of the boy who, by constantly and regularly projecting a pea on to the arch of Waterloo Bridge, could ultimately wreck it; or the instance of a body of men who are required to "break step" when marching over a suspension bridge. The cause of the Belfast disaster will probably not be ascertained until the Board of Trade enquiry is held, but everything seems to point to our original assumption—overloading on the upper floors. Whilst referring to this subject it is opportune to note that the Improvement Committee of the Manchester Corporation has decided to appoint Mr. William Wilson, an official in the city surveyor's department, as inspector of dangerous buildings, the salary being £230 per annum. The object is to prevent accidents similar to the one which occurred on the occasion of Lord Roberts's visit to the city, when a woman was killed by the fall of a coping-stone in Deansgate; a fatality which we commented on in our issue for October 23rd last.

Shams. THE present is an age of many things, and amongst others it is an age of shams. So insidious has been their production and so demoralizing their effect, that people regard them with tranquillity and even with admiration; and the misfortune is that the practice of making imitations is increasing in all branches of industry. Taste doubtless changes with the times, but if a thing has some logical reason for its being and construction it will outlive the fashion of the moment, though it be the fashion itself. Take doors as an instance. Suppose a front door is wanted for a suburban house, and that deal instead of oak has to be used on account of expense. To leave it unprotected is obviously a mistake, as the rain will drive into its pores, swelling the joints and rotting the wood. Consequently it is painted. This is perfectly justifiable; and if the door has been well designed and made, however plain it be, it should be as satisfactory to one generation as to the next But why spoil everything by graining? Why spend money on trying to make it look what it isn't? The idea is absurd on the face of it, yet the reason for this "embellishment" is that the general taste is so demoralized that people have come to regard plain things as necessarily ugly, and hence to be avoided; whereas they are courting ugliness in its worst form—fraud. This subject of graining is perhaps a hackneyed one, but some good has certainly resulted from the tirade against the practice, and we see more houses with neatly-painted windows and doors than formerly. The passion for graining has invaded the inside also, and besides sham skirtings, dados and picture rails there are even cast-iron chimney-pieces grained to look like walnut! When one arrives at articles of real wood another difficulty presents itself, one which is also due to the popular hatred of anything plain. Let any person with taste look upon those walnut overmantels and sideboards which are the joy of the furniture dealer. Has one anything but contempt for the puerile "carving" or the turned knobs and pillars which so commonly get loose because they have never been properly fixed, or for that bugbear, the pediment with rosettes? And, to add to the effect, there must be generous application of varnish and polish. Yet this is the kind of stuff which people of standing fill their homes with. Then, again, consider how sham half-timbering is regarded by the public—the intelligent public. They say it looks the same as the genuine construction, and the house holds up; so what, they ask, can be the objection to it? These people would regard as clever the painting of dummy windows (with the blinds down) on a blank wall space, or they might even go so far as to approve the erection of imitation ruins. Similarly, they will use celluloid articles which imitate ivory and tortoise-shell, stained wood for ebony, imitation old furniture, imitation inlay work, sham stained glass, gas fires with logs of wood in them made of fireclay, and the hundred-and-one other shams of to-day. It is true that in some cases these things are forced on them—such as marbled slate mantelpieces which are in their house when they rent it—but they need to be roused from their state of complacency and to appreciate the fact that when an article is what it pretends to be, that is something in its favour; and that when it pretends to be something which it is not, then it should be avoided on every possible occasion. By constantly dinning this into people's ears one may hope for some improvement taking place; and both the individual and the community will benefit by it.


COTTAGE AT NOTRE DAME BRUGES

DRAWN BY F. STANLEY MITTON.

Glazed Tiles. MR. HALSEY RICARDO'S paper on "The Architect's Use of Enamelled Tiles" is not only useful and interesting for the excellent critical history it furnishes of this subject, but also for the many conclusive arguments which the author puts forward for a much more extended use of glazed tiles on modern city buildings. His two remarks that "for half the year our city is the colour of a dirty cobweb" and "the ordinary brick wall is nearly as thirsty as a sponge-cake" summarize very well his plea for more colour and illustrate the fact in its favour that a thin glazed skin will more effectively keep out damp than a thick porous one; so the weight of walls could be reduced. While we agree that a glazed street architecture is suitable to dirty cities, we fear there is little hope at present of seeing it carried out on the large scale which Mr. Ricardo considers essential to success. The Birkbeck Bank is a glazed building, but the flagrant abuse of the material utterly condemns it. "The colour must be laid on in a broad bold mass, and pattern used only sparingly"—not allowed to go rampant, as on this bank.

A Cottage at Bruges. BRUGES, which in Flemish means "bridges," a name due to the many picturesque bridges crossing the canals, was the great commercial centre of Europe in the fourteenth century. Of its architectural beauties the belfry is the chief, towering up 352ft. It was begun in 1282 and finished at the end of the fourteenth century. Notre Dame is a church surmounted by a tall brick tower, a fine work dating back to 1230, with a modern spire which rises to 442ft.; the nave and inner aisles belong to the year 1180, while the outer aisles date from 1480 to 1520. The pulpit is of wood, elaborately carved, a feature common to churches in the Netherlands. Close to Notre Dame is the delightful cottage shown in the accompanying sketch.

SICILY AND ITS ARCHITECTURAL MONUMENTS.—II.

By F. HAMILTON JACKSON, R.B.A.

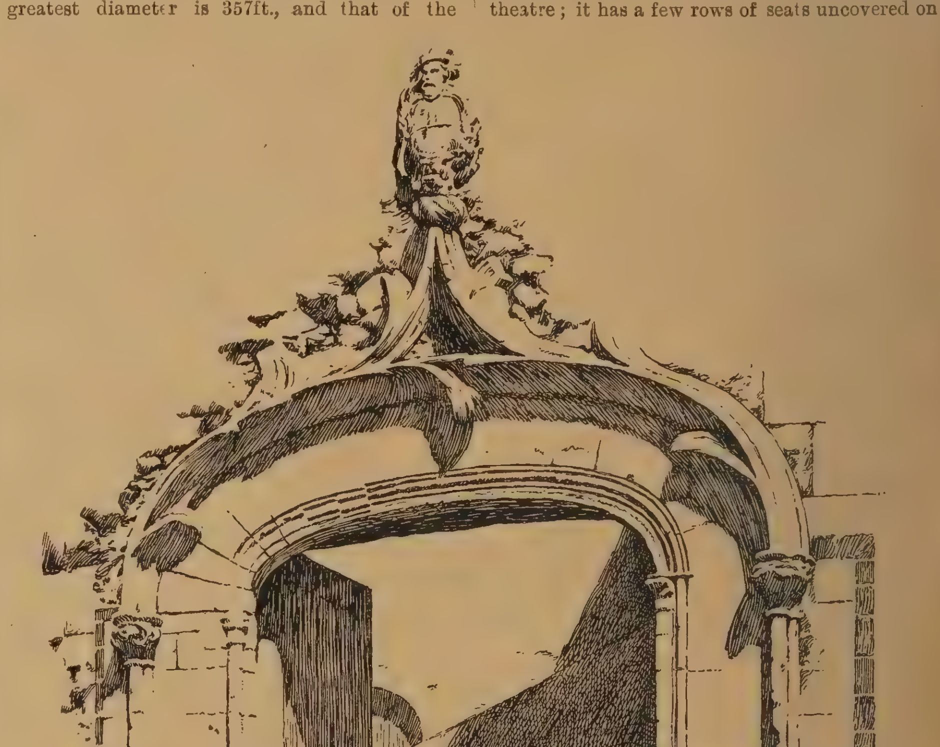
(Continued from p. 377, No. 362.)

TAORMINA lies on the side of a hill, called Monte Tauro, above the station of Giardini, and about three miles from it by the new road, though it may be reached in half an hour by means of a steep mule-track. As it is nearly 400ft. above the sea, extensive views are commanded by many points, both inside the town and immediately beyond the gates, looking in both directions. To the south Etna dominates the landscape, the sweeping curves of the coast leading the eye towards it, and the lines of the hills as they decline towards the sea contrasting and emphasizing its enormous bulk. From this side the height of the mountain is not so striking, the slope of the sides being exceedingly gradual, owing to the large space covered by the outlying spurs, and indeed it is difficult to realize that its summit rises to the height of 10,742ft. To the north the view is bounded by the mountains above Messina, while the mainland shows pale and delicate across the strait, and the coast-line is broken by the beautiful capes of S. Andrea and Taormina. The line in both directions runs by the coast, a practice which much conduces to the pleasure of the traveller, and which most of the Sicilian railways follow; and the journey, especially if made by a slow train (which is never crowded, so far at least as the second- and first-class carriages go), is most interesting and the scenery delightful. Many "fiumare" are passed, broad expanses of stone with occasionally a pool or two of water still remaining, but used by the country people as roads during a great part of the year, as is evidenced by the beaten track which meanders along by the side walls which confine the flood when it comes—as one must suppose it sometimes does, or why the elaborate and extensive preparations? At such times one is inclined to wonder how the people get about, forgetting that these river-roads are only auxiliary to the main highway. Many of the hills, at least the lower spurs, are crowned with castles or monasteries, most of them in ruins, but a few still inhabited. Those of the former category form the greater addition to the picturesqueness of the landscape.

The town is asserted to be of Siculan origin, or even Sicanian; at all events, after Naxos was destroyed by Dionysius of Syracuse, in 403 B.C., the Siculi who were established there went up to Monte Tauro and disappeared among the inhabitants of the city which was already there, and of which they appear to have erected or rebuilt the acropolis in gratitude to the gods for their release from slavery. (This was on the height above the town, where the ruins of the Saracenic castle may still be seen.) Andromachus (396–352 B.C.) was the name of the ruler who received them, the father of Timæus the historian, whose hatred of tyranny and love of liberty were probably the result of the example and teaching of his father, whose character was a great contrast to that of the usual tyrant. He it was who invited Timoleon and his Corinthians into Sicily, and it was from his house that the latter set forth on the triumphal march which freed Sicily for a time from tyrants and Carthaginians. The ancient name was Tauromenium, a name which it bore for a long time and of which the modern name is a corruption; but after the third taking of the town by the Mussulmans it was named Muezsiya by Hassan-el-Muez, its conqueror, who also introduced a colony of Mussulmans. The second taking was by the bloodthirsty Ibrahim-ibn-Ahmed, in 902—at the same time that Mola, the inaccessible-looking village on the hill beyond the castle, was taken and the whole population massacred. They only held undisputed possession of the town for 100 years, since the Normans took it in 1078, a capture which was most advantageous to the place. At one time the population, which is now but 3,000, must have reached 100,000, if the size of the theatre may be taken as any criterion. It was one of the first cities to protest against the tyranny of Verres, throwing down the statue which the pro-consul had erected in the forum, and here a number of slaves established themselves during the first Servile war, offering a long and obstinate resistance to the soldiers. Together with Mola, it has been the scene of many romantic deeds of arms; and when one considers their apparently impregnable position, situated far up steep rocks, one wonders how it was possible to take either before the invention of gunpowder.

The most important building in Taormina, and the one which is the principal object of attention, is the theatre, erected in Greek times, but reconstructed by the Romans, under whom the town was very flourishing. The local authorities have the liberality to leave it open from 7 in the morning to 6 in the evening, so that one is able to go again and again and see it under different conditions of light and shade, and even, if one pleases, follow the guide-book directions and see the sunrise from that point of vantage; for the custodian, who lives in a little house on the summit of the rock, is very civil, and makes no difficulty about leaving the gate unlocked if requested.

The proscenium is well preserved, as such things go, and, indeed, there are but two others—those of Aspendus, in Pamphylia, and that of Orange—which are in so complete a state. Its greatest diameter is 357ft., and that of the orchestra is 126ft. The back wall is two storeys in height, and has had some of its original decorative details re-erected. Three entrances are provided, and between the centre doorway and each of the two outer ones are three niches, and on the further side of each outer doorway one niche for statues. The stage is narrow, on the Greek plan, and beneath it is a vaulted channel in which the rainwater from the rest of the theatre was collected and through which it passed away. The seats were divided into nine "cunei," or sections; around the top ran a corridor, the upper "præcinctio," which belongs to the Roman period, since the wall (which is coved on the exterior at the top) crosses diagonally the remains of a Greek house or temple. Steps remain, and some rough mosaic floors within the walls, made of irregular pieces of white marble on a ground of broken pottery, looking much like "opus signinum." According to an inscription behind the stage, the theatre was destroyed by the Saracens, but the greatest destroyer was the Duca di San Stefano, who employed its marble ornaments in the decoration of his palace. Behind S. Caterina, close to the Palazzo Corvaia, are the remains of a small Roman theatre; it has a few rows of seats uncovered on



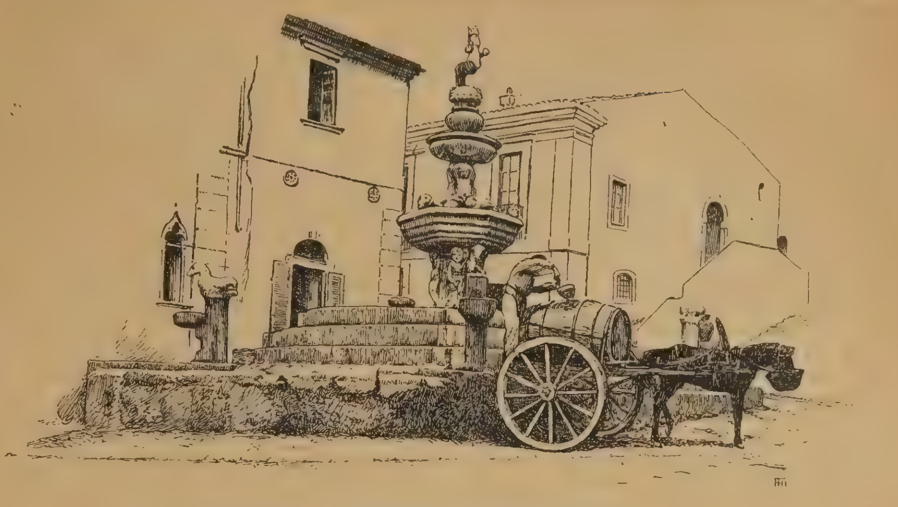
DOORWAY, PALAZZO CORVAIA, TAORMINA.

one side, and a vomitorium in the middle, the vault of which is oval in section. The church of S. Pancrazio, outside the Messina gate, is the cella of a Greek temple, and, with a Roman bathing establishment called the Naumachia, without any authority for the name, exhausts the antique remains of the city.

The mediæval buildings are almost as interesting. The first place must be given to the Palazzo Corvaia, a building perhaps of thirteenth-century origin, but which appears to be of the fourteenth. It has two-light windows with ogee hood moulds, and inlays of lava in string-course and cornice, while the wall is furnished above with forked battlements. In the courtyard is a fourteenth-century relief representing the creation of Eve, the Fall, and Adam delving while Eve spins. An outside staircase ascends to the *piano nobile*, in the great rooms of which are traces of wall frescos. Here it was that in a large hall (now given-up to chickens except where used for the purpose of storing corn and beans) a general parliament was held, promoted by Bernardo da Caprera, Count of Modica, which on the death of Martin the Second without direct heirs, in 1410, gave to Sicily a national king in the person of Caprera himself, already grand justiciar. It was but two years later that the jealousies of the barons called in the Castilians.

The north door of the cathedral is of the fourteenth century apparently, but the interior is rather earlier. The nave arcade consists of large columns with roughly-cut caps. On the left, near the high altar, is a seat raised on four steps, the whole of red marble, probably for the seigneur, or the signory; opposite are the seats for the celebrant and his assistants, made of wrought iron, a very unusual feature. On festa days the first mass is said at the unearthly hour of 3.15 a.m. A fountain in the piazza is picturesque, but not ancient, though some of the sculpture is very much worn. The Palazzo S. Stefano, called also S. Germano, is said to be the palace for the construction of which the theatre was stripped of its marble. It is a late thirteenth-century building, though portions of it look earlier. The windows and the curious crowning feature inlaid with lava are similar to another facade higher up the hill, now unfortunately a mere shell, La Badia Vecchia, which has three pointed windows of two lights each with tracery above and a more lavish use of inlay. In the crypt of the Palazzo S. Stefano is a central column of Greek marble, which supports the vault, the capital of which is also of marble but with late thirteenth- or early fourteenth-century carving. This room was used as a bath, though only accessible from outside, and in the wall the conduit through which the water flowed still remains, leading to a curious pit-like sinking, about 4ft. deep, in a triangular space sunk about 1ft. below the floor-level. The whole is lined with marble. The water at that time came from Monte Venere, but the modern supply comes from a less distance. Another palace, the Palazzo Giampoli, stands at the top of an imposing flight of steps. It has a Renaissance doorway and window of graceful proportions at the side, though itself thirteenth or fourteenth century. Others of the ancient palaces have either pointed windows of several lights, or doorways of the type of that illustrated.

A few balconies with Spanish-looking ironwork are to be seen, but for the most part Sicily is rather bare of this kind of interest, and Taormina is not exceptional in this respect. The names of the streets were scrawled up in red paint, but neat tablets of roughened grey marble, with the letters and border polished, are superseding without destroying them. At the end of the town, beyond the Porta San Pancrazio, is a curtain wall leading to an outlook post. From this place a fine view of the town may be had, and one looks right down upon the monastery of S. Domenico (now an hotel), the sacristy of which contains some fine Renaissance carving in frieze, pilaster and panel; there are also carved stalls in the monks' choir, behind the high altar, of similar style, and in a chapel at the bottom of the church is an interesting early monument. Of the Saracenic period the remains are the castle on the hill and portions of the walls, for there is more than one line of defence, but to the untrained eye the difference is scarcely perceptible. A few wall fountains make picturesque bits of light and shade; and from the main street delightful glimpses of sea and distant country appear down precipitous alleys, while from the two or three piazzas more extended views may be had; for it may be repeated that the greatest charm of Taormina is the beautiful view over mountain and sea which is visible from so many points in and about the town, and the lovely sunsets and sunrises, which the early habits of the place (they milk goats at your door at 6 a.m.) stimulate the traveller into seeing many more of than he would at home.



FOUNTAIN IN CATHEDRAL PIAZZA, TAORMINA.

The main line from Taormina to Catania continues to run by the sea, with the slopes of Etna on the right hand, from which numerous lava streams have descended at different dates. On the northernmost of these stands the Castello di Schisò, which indicates the site of the ancient city of Naxos. A little further on is another ancient lava stream, where the road to Catania viâ Randazzo diverges—one which in B.C. 396 prevented the Carthaginian general Himilco from proceeding direct to Syracuse after the destruction of Messana, and compelled him to march round the mountain. Timoleon also followed this route in 344 B.C., and Charles the Fifth in 1534. Above Giarre, a station which serves two villages between which it stands, in the common Sicilian fashion, are the remains of the gigantic chestnut tree called "di Cento Cavalli" (of the hundred horses), that being the number which its spreading branches were reputed to have sheltered at one time, and several other famous old trees. This is the place from which the Valle del Bove and the craters which were active in 1865 are best reached. It is thought that the original crater of the volcano is above this "Valle." Several more lava beds are crossed, and Acireale is reached, standing among its orange groves and olive woods, a prosperous and quite uninteresting place with warm mineral springs, rebuilt after the earthquake of 1693, but the locality of the myth of Acis and Galatea; while a little further on the rocks of the Cyclops hurled by Polyphemus at the escaping Ulysses may be seen at Aci Castello, where the picturesque old castle combines with them and the coast-line to make a delightful picture. More lava streams are crossed and the line descends towards Catania, which it enters on its least attractive side.

(To be continued.)

A Record of the Repairs to Winchester Cathedral has been cut in stone and recently placed in the west end of the nave. It states that the repairs to the roof were begun in March, 1896, and finished in December, 1898; the cost was £12,670 10s. 11d.; and the total area treated, 31,973 ft. super., or about three-quarters of an acre; weight of lead removed and recast, 156½ tons, put on 197½ tons; weight of new oak, 198¼ tons; weight of pitch-pine in battens, &c., 326¾ tons; length of battens, 93,510ft., or about 17 miles. The work was carried out by Mr. J Thompson, of Peterborough, under the supervision of Mr. J. B. Colson, F.R.I.B.A. A good deal of necessary work on other parts of the roof remains to be done.

THE ARCHITECT'S USE OF ENAMELLED TILES.*

BY HALSEY RICARDO.

THE architect's use of enamelled tiles may be classed, for convenience sake, into three divisions, according to the purposes for which he uses them—either on hygienic grounds; for the purpose of saving or reflecting light; or for decoration. These three divisions blend, of course, into each other, and sometimes all three objects are obtained simultaneously in one scheme of tile-work. Thus, the staircase hall in Lord Leighton's house presents a wall whose surface can be thoroughly and easily cleaned; whose glaze checks the diffusion of air, dirt and moisture; which retains its light and colour even in the darkest corners; and which by its pattern and hues constitutes a beautiful scheme of decoration.

More often a combination of two requisitions only is secured, as in the case where tiles are used to line underground passages, railways, lavatories, dark rooms and courtyards. In a dairy, to take another example, the decorative as well as the hygienic aspects of the case are sometimes considered. But for the present I shall pass by the builders' and plumbers' use of the material, and shall consider mainly the employment of

Enamelled tiles as a Mode of Decoration.

Incidentally for this form of decoration I shall claim the collateral advantages it affords both as regards the economy of light and the wholesomeness of the practice of covering one's walls with an impervious glaze; but the decorative treatment is what I shall most concern myself with, considering its use and the limits of its use, and what should be the architect's attitude in regard to this method of architectural enrichment.

In referring to the examples of tile-work in the past, I shall allow myself some latitude in my definition of an enamelled tile, for I shall want to cite the Assyrians' use of glazed bricks, the Persians' treatment of glazed terra-cotta and the Della Robbias' of glazed earthenware; the differences, however, which are so apparent are not essential, but arise from the nature of the material.

A glazed brick is only a thicker tile and a glazed plaque but a wider one. An enamelled tile, then, is a slice of terra-cotta with its face glazed with white or colouring matter put on it or in the glaze. As a rule, the terra-cotta foundation has a distinct colour of its own, which shows through and modifies the effect of a transparent stained glass poured over it. To obviate this—when the simple result is undesired—there are

Two Methods

generally practised; one, to render the glaze partially or entirely opaque, by the admixture of oxide of tin; the other, to mask the surface of the terra-cotta with a film of white ware or porcelain (technically known as slip), and on this to flow the glass.

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* A paper read before the Society of Arts on January 21st.

The difference in effect of these two methods is very striking; comparable in terms of water-colour painting to the use on the one hand of transparent tints, on the other of body colour. In the first instance, the brilliancy of the hues and the subtlety of the gradations depend upon the whiteness of your paper: that is, the paper is your highest light, and every tint you lay on it is so much diminution of its brilliancy. So with the slip-faced tile, the white porcelain face is your highest light, and the more brilliantly white it is the more brilliant show the colours of your stained glass upon it; it is the light reflected from the ground behind the glass that brings out the glory and the splendour of the dyes. So it is, precisely, with transparent enamel-work on metal: the more brilliant the ground, the richer and more beautiful the enamel.

With painting in body colours the nature and colour of the ground are unimportant—brown paper will do: the brilliancy of the finished effect depends upon the purity of your white paint. So with opaque enamels, whether upon metal or terra-cotta, the brilliancy must be in the glass itself; the ground contributes nothing to the effect.

The Difficulties of the Glass Face.

The glass face to the tile is one of the difficulties in tile manufacture. It has to be melted on the tile, brought to a viscid state like treacle, and by rights both the glass and the terra-cotta should contract equally on cooling. But they do not; and the addition of a white-ware slip complicates matters. Consequently cracks, generally minute but sometimes serious, occur in the glaze – known in the trade as "crazing" —and may be classed under two heads: those that, occurring in the thickness of the film, still do not actually split it, and those that really divide the glaze, and in consequence expose the body of the tile to the elements.

In many cases the "crazing" (where the cracks do not come through the glaze) adds a quality and charm to the tile. The walls of the fissures on either side slope at an angle, and catch and reflect the light, giving a lustre and a sparkle to the tile. But where the "crazing" is thorough, it is an evil, for it renders the tile unfit for use if exposed to the weather, and even for internal use the beauty of the tile is gradually dimmed, because the cracks in time get filled up with a fine siltage of dirt, and the effect is that of a black cobweb sullying the surface.

Tiles used Externally.

The question of using tiles externally is made very difficult by the doubtful behaviour of the tiles themselves. It is a common sight to mark great patches on walls, where tiles have been and have dropped off—to find them cracked and discoloured. The Underground Railway here is painfully rich in examples of their failure, and I note that the linings in the Two-penny Tube are beginning to discolour. Wet, followed by frost, with an imperfect key for fastening at the back, accounts for the downfall in most cases, whilst the impure atmosphere of London endeavours to discolour everything that it cannot corrode.

In Mr. William De Morgan's opinion, tiles made on the "dry" system—*i.e.*, of clay ground dry, and compressed into shape by hydraulic pressure—are unable to withstand the action of frost when damp. The particles are in such a juxtaposition that the tile is soon saturated with moisture, and when this crystallises there is no room for the expansion of the water, and consequently the ice breaks up the tile; whereas, by the "wet" system, when the clay dust is mixed with water and pugged and variously handled before it is dry enough to go into the oven, the disposition of the particles of clay allows for some expansion of the moisture that has soaked in, which enables the ice to be formed without doing damage to the tile or its cement backing.

Fixing and Joints.

Fixing is often imperfectly done, and unless the fixing is perfect—that is to say, absolutely solid over the whole area of the back of the tile—its detachment is only a matter of time. Tiles made by the "dry" process keep very true in shape throughout all the steps in their preparation (which is by no means the case with those made by the "wet" process), and this accuracy makes their fixing much easier; and when a wall is being tile-plated with a view to protection from the weather or reflecting the maximum of light, a close joint is a desideratum. Too much stress however, I think, is generally laid upon this fine joint and even surface, and the tile-work is apt to look tired and mechanical in consequence.

We lose much of the inherent qualities of our materials in our attempt to secure an excellence that really does no justice to them, and which has as its chief merit that it saves labour and ministers to our convenience.

Of Necessaries and Luxuries.

Now, as regards the necessaries of our lives, these be great and real excellences. To be able to build a wall rapidly and well with bricks that can be equably and truly laid, set in mortar, mixed, and mixed most efficiently, in a mortar mill—is a true convenience, and all thought to that end is thought worthily expended.

But when we come to the luxuries, that is another matter. If you cannot afford to have them done well, why have them at all? It is their excellence that is the justification of their expenditure. And these not quite first-class luxuries defeat their own ends. They are not luxuries unless they amuse and interest us—and how can the blind fingering of a machine tell us of anything beyond its inhuman perfection?

Compare a slab of marble, hand-polished, with one that has been polished by machinery. In the first instance, the surface is full of life and movement; the light falls on its tiny depressions and irregularities, awakening wayward reflections, strengthening and palliating its colours, developing its lustres and translucencies, so that it becomes rich in story as well as in hue. In the other there is the dead level of polished surface, unassailably perfect, but, comparatively speaking, uninteresting. The life and vivacity of the marble are gone; it is merely a polished record, with the pleasant part of its individuality rubbed away into a wearisome uniformity.

So it is with the machine-made wood-panelling with which we decorate our rooms and halls. From lack of any other special qualities its mechanical excellence becomes an offence, and we hang pictures on it and back furniture up against it to mitigate and interrupt its exasperating uniformity.

So with mosaic work. To keep the tesseræ equal and to set them all to one level face is to renounce the great quality of life in one's work and to throw away much that constitutes the charm of the material.

With tile-work the same holds good. A great sheet of exact-shaped tiles, with dead true faces, irreproachably fixed on a dead straight wall (such as one sees at the Wallace Gallery, Hertford House), is sad miprision of the qualities of the material. The want of thought in the arrangement, the presence of mechanism both in the design and the facture (I can hardly use the word *manu*facture, for the hands only guide, they do not make) makes the result a bore and oppressive from the consciousness that it must have been expensive.

What Modern Tiles should be.

That all tiles should be made by the wet process and all be hand-painted is asking, in these days of economical production, more than the circumstances demand; but we might narrow our requirements down to these few particulars, and refuse to allow ourselves to be tempted to enlarge them: that all tiles should have a sufficient key for fixing; that they should be coated with a glaze that protects them from injury by dirt, acid or attrition; that those which are to be used for external purposes should be able to withstand the weather; and that when a printed pattern has to be on the face, that pattern should be of a very simple character, so that its mechanical repetition may be as little tiresome as possible.

In firing a batch of tiles there are generally some variations in the intensity of the colours, &c.; and where the pattern is very simple these discrepancies become fairly marked, and when judiciously assorted help to alleviate the regularity of the printed design.

There are various shifts that may be legitimately used to temper the exorbitancy of hand-labour, such as stencils, printed outlines, and so forth, but the cloven hoof is apt to peep out from amongst them; and the larger the area of repetition the more marked becomes the mechanical regularity of the design. A tile used in a single series down the side of a grate hardly betrays the method of its colouring, but a square yard of them blurts out the story beyond any possibility of suppression or disguise.

Where cost is a consideration and a large quantity of space is to be covered, use plain coloured tiles, and encourage such processes as exhibit the humours and behaviour of the kiln. The glory of a tile is its colour—the pattern is little more than a set of pegs on which to hang these colours; and to cripple one's effect by unnecessary care upon the skeletons of one's figures of beauty is a miserable misapplication of force.

So much, then, as specification of the tile from the decorator's point of view, and of the chemistry of its clays, of its glass, and the methods of handling and firing, I shall not here concern myself; but with the application of the finished article, and that not so much from the utilitarian point of view as from the decorative.

It will be as well, I think, to glance briefly at what has been done in the past, and at examples of what are acknowledged to be masterpieces in the way of tile-work when the art of tile-making and tile-using was at its height. To do this at all adequately is out of the question on this occasion, and it is only by severe and reluctant pruning that I can contain myself within reasonable limits.

Egyptian Work.

I must begin with Egypt because they began first. They discovered a stone that would stand glazing, and they used glazed wall-decoration extensively. The Tell-el-Yahoudi plaques are to all intents and purposes wall-tiles, and their date is 1400 B.C., and Dr. Flinders Petrie has discovered glazed wall-tiles of a still earlier date amongst the ruins of the palace erected by Ku-en-aten in his newly-founded capital. The colours mostly have disappeared owing to the action of the damp during the centuries wherein they lay buried. When the Egyptians used polychrome decoration on their plaques the different colours were let into the object, making it a kind of tile mosaic—not painting, as in a picture, on the surface.

The Discoveries at Susa

mark an advance in the art of wall-decoration. During the Achæmenian dynasty the royal palace had its walls adorned with panels of painted plaques, but these were rather bricks than tiles, and the methods employed were derived from the glazed bricks employed in the architecture of the Babylonian and Assyrian empires. The walls were built of light grey and light rose unglazed bricks ranged somewhat like the walls of the Ducal Palace of Venice, whilst the ornamented parts, which were the portals and great entrance staircases, were in enamelled terra-cotta bricks, the colours being separated by what appears to be a vitreous wall, something after the manner of the metal walls of cloisonné enamels.

Darius gave up the use of terra-cotta and employed a kind of concrete for his bricks, because he found the enamel wore better on the latter.

Ecbatana, with its Walls.

From Susa 'tis but a short step into Persia and that amazing entity, Persian art. In Mesopotamia the Medes built the town of Ecbatana. Up the sides of a steep hill rose the seven circular walls, one inside the other, enfolding the treasury and the king's palace. The outer wall was of immense diameter, and the terraces enclosed by each ring carried collections of country houses with small farms and gardens attached, rather than the suburb buildings to which we are accustomed.

The city was consecrated to the great powers of the firmament, and the devotion of its founders was registered in the form and colour of its walls. The battlements to the outer wall were white; to the next black; the third scarlet; the fourth blue; the fifth orange. The two last walls had their battlements silvered and gilt.

This profusion of colour and metal-work strikes us as extravagant, even in conception, not to speak of realisation; but in Herodotus's time he was writing of facts well-known to many of his readers who had seen Ninevah and Babylon and the pictured splendour of Egypt.

Amidst this wealth of artificial colour grew up the art of Persia, as we know it, and its influence throughout the past has been very subtle and far-reaching. It has coloured India and the shores of the Mediterranean. It is impossible to look at the Moorish work of North Africa and of Spain and not feel the Persian influence exhibited; nay more, most of the work must have been done by actual Persians carried in the train of Arab conquerors. The art of Byzantium played upon it and probably deeply influenced it, but our knowledge of Byzantine art is at present too imperfect to let us pronounce definitely in this direction. The stream of merchandise that flowed through Persia brought with it samples of the porcelains from far Cathay, and after a certain date Chinese influence on the Persian potter is very perceptible.

In China coloured tiles are largely used in exterior work. The "Porcelain" tower at Nankin (destroyed 1853) was so called because the lowest of nine storeys was covered with glazed brick; the eaves over the balconies were roofed in with green tiles, and the window jambs plated with glazed porcelain modelled in relief.

Tile-Making in the Middle Ages.

In the Middle Ages, and outside the sphere of Persian art, there was tile-making, but the tiles so made were for pavements and later on for roof-coverings. The floor tiles were made glazed, but the glaze soon wore away. Innumerable examples of these abound in England and on the Continent, made, I imagine, to reproduce as well as might be the splendours of the marble pavements abroad about which the pilgrims spoke when they returned from Rome and Byzantium or from their crusades in Paynim lands.

When the revival of letters and classic lore and antique art set in, every craft was touched by its influence, and pottery had its renaissance as well as sculpture. But the tile makers drew their new inspirations, not so much directly from the past, as from Spain, and thus in this roundabout way came under the influence of Persia. The Arabs invaded the peninsula of Spain A.D. 711, and remained there, so far as their influence of the tile trade is concerned, till 1610. The Alhambra was begun in 1272, and the tiles that decorate it are the oldest and most interesting in Spain. Their repute widened, and Spanish tiles spread far and wide; they

PALAZZO S. STEFANO, TAORMINA. DRAWN BY F. HAMILTON JACKSON, R.B.A.

were imported in considerable quantities to Genoa, to Naples, and to the islands westward of the peninsula of Italy, and, in company with the European craftsmen, found a market in India.

Della Robbia: Faenza: Majorca.

During the period of the Renaissance various attempts were made to develop the qualities of glazed ware in the direction of architectural employment, the work of the Della Robbia family being the products perhaps the most generally known. Famous factories were established at Florence, Faenza, Gubbio, and many other places under Italian rule; and under the Spanish in the Balearic Isles, and at Naples. So famous were they that they gave a name to their ware that lasts to this day. Faience is Faenza ware, Majolica is the pottery that comes from Majorca.

In the Spanish Peninsula the Renaissance found a special state of affairs. To the south, in what was once the Sultanate of Cordova, Moorish traditions and Moorish craftsmen still lingered on, distinct from the Christian workers who were absorbing their territory; and these rival potters had occasionally blended, so that, besides the Christian and the Morrisco styles, there was a third style that went by the name of Mudejar. It was not till the time of the Great Emperor Charles that the influence of the Renaissance began to show on Spanish work—the painted tiles date from the sixteenth century. Talavera was then the famous emporium, and its goods supplied the country, Portugal and the Far East.

In England glazed plaques, other than paving tiles, are rare. There is an interesting specimen in Lingfield Church, Surrey, an effigy of the time of Henry VIII. in glazed tiles. The figure is incised on a rather coarse red clay covered with a greenish glaze now much worn away. It is supposed, however, that the tiles are of Flemish origin. Similar instances of sepulchral portraiture are fairly common in France.

Tile Pictures.

By the time we are reaching the sixteenth century tiles in Europe—except for pavings and skirtings—are ceasing to be architectural adjuncts, and becoming—or trying to become—more and more tile pictures. It was the flood-tide of the painters and painters who prided themselves on their versatility. Every material was pressed into their service; mosaics, stained glass, tiles, pots, plates and dishes—all were to come out as pictures regardless of the qualifications and the limitations of the material.

In Spain, the Spanish Netherlands and the two Sicilies this picture-painting was taken light-heartedly; the humours of the material were allowed to have their say, and there is a general air of not being on your oath in the treatment of these panels. If you recall the subject of a set of Dutch tiles, you will see a kind of ease in the handling and a liberal acceptance of the imperfections of the ware altogether different to the tense serious treatment of a Maestro Giorgio tazza. The result is that these (to use the loose and inaccurate but generally accepted appellation) Dutch and Spanish tiles persist to this day as living things, whilst the solemn works of art are to be found now only in museums; and we can observe how hopelessly dead the art of them has become by the imitations that are being here and there manufactured.

These finished picture-tiles fulfilled no real want; and as soon as the great burst of enthusiastic appreciation of all forms of craft was over, and the wave of studio excellence abated, they dropped out of circulation. Nobody would have of such things any but of the very best, and the very best were not being made Even the other, more homely, efforts shared in this discouragement and soon sank to a serviceable level, such as lining dark walls and those services that were likely to get discoloured by smoke and dirt; and on these terms they are made and used to this day.

The high standard of draughtsmanship and design had this moral disadvantage, that the artist, to gain this excellence, had to devote his whole force and attention to the pictorial side of his craft, and so became divorced from his material. The tile was no longer treated on its own merits, and its decoration evolved therefrom, but as a field for the painter's display, and to secure effects which, though proper and natural in frescos and easel pictures, are foreign to the nature of a tile, and can only be exported (and then but partially) by the utmost technical ability.

"The Changeless East."

In the East and that part of Europe under Persian influence—as regards the potter's craft—the aim was different. The qualities of the clays and glass were accepted as the basis for development and improvement, and all advance, both in the substance and the technique, was evolved from the tile itself. Nor was the standard pitched either too rigidly or on too high a plane. The ideal was not beyond the reach of the craftsman, and there was no thought of the presence of some superior imported personage who should invest with the garniture of Art the product of the potter's labour; and yet, on those terms, we have examples of consummate work—supreme in technique and in beauty. And this art is still alive, and if it could be left undisturbed would go on quietly fulfilling its purpose.

Unfortunately the restless activity of modern life, with its eager but ignorant appreciation of foreign work, is battering at its door, and we are all busied by our patronage to change "the changeless East."

European—and I am afraid English—influence has, in its blind admiration for the art of Japan, ruined it. It set up a huge and feverish demand, and the Japanese at once set themselves in haste to satisfy it. Other nations in the East are not so mercurial, and consequently have not been so much affected, but they have not been uninfluenced. Both India and Persia, not to speak of other countries, have set themselves to serve the British markets and to conform to British standards. It may be inevitable: it is certainly disastrous. It is sad to think how, with all our good intentions, destructive we are of all those qualities we talk so glibly about—destructive because we are ignorant of what is the essence and purpose of the qualities we call Beauty and Art. At this moment we are not agreed as to what constitutes beauty and what is the function of art; and in our perplexity, whilst attempting to preserve and enlarge the influence of beauty, we do actually eliminate it, whilst we are agreed to transfer art from the practical side of life and to view it as a kind of varnish which only the cultured can acquire and the leisured enjoy.

During the past century we worked ourselves up to a consciousness of the beauty of the works of the Middle Ages in England, our Gothic monuments in especial. We set to work to preserve these beauties, and not knowing wherein they consisted we replaced them with restorations; consequently, nearly all of the chief examples and an immense number of the small are examples no longer. In place of the original, with its history and its beauties, we have a replica which is a modern and silent forgery.

An Instance of Modernism.

Another common instance of ignoring what constitutes the actual charm and beauty of a thing is when some traveller discovers a little spot that has been left untouched by the modern excursionist. Struck with its peace, and the beauty that comes from centuries of quiet contention with and mastery over Nature, and anxious to share his discoveries with others, and thus add to their happiness, he shouts aloud in the highways and market-places the beauty of the village he has found and the simple content of its inhabitants. The ring of enthusiasm in his voice reaches many ears. Next year the village is invaded. A toad-stool growth of cheap lodging-houses springs up, and attractions (so-called) are constructed. The railway sprouts out a branch line, and a station is dumped down cheek by jowl beside the church. The place is now easily accessible, and hundreds can now enjoy the refreshing solitude and idyllic simplicity of the place. Only the solitude and simplicity are gone. So with our improved methods of transit, our facilities of commerce, and our demands, too important to be disregarded and too urgent to be properly executed, we have brought Oriental wares within reach of the humblest; but the beauty and excellence of the stuff is fast disappearing.

Let us review some examples of the architectural application of enamelled ware in times before the advent of the railway and the influence of the connoisseur was less universally diffused.

(A fine series of lantern slides, obtained from the South Kensington authorities, were at this juncture thrown on the screen, illustrating examples in Persia, Turkey, Spain and other countries.)

The Function of Tiles.

And now, what is the moral of all this? One thing that can hardly have escaped notice is the nature of the country in which the examples that you have seen occur. Both in Persia, Tunis and in the Spanish Sierras we are in the presence of arid wastes. Outside the towns there are no trees, no pasture. There is the blue sky over us—but, till twilight, too blinding for the eye to contemplate. No doubt there is a colour in the vault of night that can scarcely be imagined by those that have not seen it; but, speaking generally, there is no colour about these cities but what is of man's nurture or manufacture. The spring brings a flush of blossom and a short-lived wealth of verdure—enough to exemplify what luxuriance of colour means. But for the greater part of the year the landscape is a sober drab affair, with little moisture in the atmosphere to temper the brilliancy of the sunshine. The great function of these enamelled tiles, then, was to catch the fleeting glories of the fields and gardens, and, Orpheus-like, to fix them as "a lasting spring." Both by their design and their colour they recall the starry meads and their wondrous varieties of hues and the lush luxuriance of their verdure.

In the Persian work this is more directly pictured than in the Spanish; but in both the instinct is to secure, by carpets, embroideries, tiles and stained glass, an entourage of colour.

Colour in Country and Town.

In this country colour is perennial with us. It has its tides, its ebbs and flows, but even at its greatest ebb we are encircled with tender russet and purple tints from the woodlands and from the ploughed fields; the pastures keep a greenness; the hedgerows an intricacy of innumerable tints; the hillsides are shaggy with copse wood, and fledged with pines; and sheets of water reflect in intensified colours the vegetation that surrounds their margins.

But it is otherwise in our large and crowded towns; there Nature's restless activities are confined in space and checked in growth. A film of grime reduces the green of summer to an inky grey, and obscures and sullies the yellow of decay, so that we view the complete ruin of the foliage as a desirable riddance, and are thankful to have the fallen leaves swept up and consumed as promptly as possible.

For half the year our city is the colour of a dirty cobweb, and the only refreshment the eye gets is in the glimpses of the sky overhead, the shop windows and the hoardings; these last mark the hunger for colour significantly.

We want colour in our streets; we have tried for it by using coloured building materials, paint, creepers, and flowers in window-boxes. But these ventures are generally disconnected attempts, and so are on too small a scale to make any distinct effect, and owing to the nature of the materials they soon sink back into the general dinginess of the surroundings.

A Plea for the Use of Tiles in Streets.

Why not plate your building with tiles? I do not suggest that a man should veneer his vertical section of a street-side that serves him as his house, and let his neighbour on either side follow or not his novel start, because colour to be effective in such circumstances must be in broad masses.

I should like to see whole streets treated in permanent colour, and please myself with the hope that some day they may be so, but as a beginning in so bold an experiment I should like to see the scheme tried on a detached building, standing free and with some trees about it, or a public building of such a frontage as should be sufficient to display a large plain mass of wall-surface. We have tried spots and panels of colour here and there in our streets already, and they have failed from the timidity of their employment and the insufficiency of their area. The colour must be laid on in a broad bold mass, and pattern used only sparingly, if at all. The windows and other openings should occur in a field of plain colour, or some simple chequer or trellised diaper, and the limits of the tiling should be bounded by bands and trimmings of glazed terra-cotta. I specify glazed terra-cotta, because in building you must not mix perishable and imperishable materials together. Whilst the one is toning, softening and decaying under the blunting hand of Time, the other is merely getting dirty; and each time the front of the house is cleaned the tiles come up as fresh and bright as on the day they were fixed, whilst the corroded framework must remain with the grime that age has brought it.

This permanence is not so great an evil as at first appears. Much, say one-third, of a house-front consists in any case of imperishable materials, such as the glass windows and the woodwork, which are renewed periodically with coats of paint; and whilst the remainder of the house is toning into a dingy uniformity, the harmony of the frontage is every few years disturbed by the freshened appearance, under the painters' hands, of the parts required by the covenants of the lease, and thus making of the harmony a painful discord.

It is true that where the materials are all indestructible the kindly agency of Time can play no part, the building is never any better than when it leaves the contractors' hands, except for the history that gradually humanises its walls; but this view of the ameliorating power of Time belongs to our timid age—the age not of creation but of selection—and is by no means a healthy one. We are afraid to risk anything, and why? Because we are so self-conscious, because we are so eaten up with our sense of responsibility. Not so came the models which we copy into being, although at this moment the style of the past most in vogue is perhaps the most self-conscious that we could have chosen, and (for this follows) the one that is the most disdainful in its refusal of colour.

Work done in Youth.

The love of colour and the power to apply it is characteristic of youth—of the youth of nations as well as individuals. The best (and by that I mean the most inspired) work is done in youth, and the colour then is the richest and most eloquent; though some there be, like Gian Bellini, or to come nearer home, Mr. Watts, who retain their colour faculty right on into old age.

In youth a nation has the courage to court failure, or rather to regard it as a passing circumstance, in its attempt to grasp the ideal. For what to them was failure but the stepping-stone to new effort? So much experience brought to them so much new knowledge and suggested so many fresh possibilities. Not only the science of architecture but the beauty which is the cream and bloom of science, grew up from the careful observation of building disasters, and the invention of expedients that might obviate their recurrence. The conditions of the time and the temper of the people determined the actual forms of the building, so that, for example, we get in one case Classic, in another Gothic architecture, but these styles were living only so long as failure was allowed to be possible and experiments encouraged. When that ceased the art of architecture became a recapitulation of past examples, the science their reconstruction or adaption.

Arguments for the General Use of Tiles;

Why should we fear to cover whole streets in London with coloured tiles? Is there anything to lose? The streets at present are not beautiful, nor are they interesting. The modern ones have no single architectonic quality. There is no general principle of design in them, no uniformity, style, composition, balance; a few good examples of designs occur in the general welter, but they make no effect on the whole, which mainly expresses private obstinacy, tinctured with selfishness. What could be gained by a broad treatment of colour is periodically shown to us when the Quadrant at Piccadilly gets repainted. In that fine sweep we have an idea, unanimity of design, and breadth of colour, and, in consequence, it is one of the pleasantest things one can meet in a tramp through town.

And Objections.

It may be objected that to incrust whole streets with enamelled tiles would be a very expensive business; and that the decoration, whether we liked it or not, would—owing to the cost involved in applying it—be permanent.

I will take the latter objection first. It would, I hope, be permanent. Any scheme, reasonably comprehensive, simple and straightforward, must be a distinct improvement on the present polychromatic distraction, gradually surrendering its distinction under the obliterating coating of London grime. No other surface wears so well. Stone perishes rapidly. Brick and terra-cotta get incurably befouled. Marble requires frequent repolishing. Granite endures, but unless it be polished it also gets very filthy. But a good glazed tile, glazed brick or faïence, should be as durable as a plate-glass window, unaffected by the wildest acids that infest our atmosphere.

Then as to cost. Of course, tiles by the acre come expensive. But there is another side to the matter that we may well consider. At present our buildings, in order to get the contrasts of light and shade—colour, in short—are covered with ornamental features, such as mouldings, pilasters, window trimmings, cornices, balustrades, and similar architectural upholstery, and adorned generally with a profusion of inferior carving. Now, although all this architectural frippery is pretty cheap stuff, considering; still, it does cost money, and by the use of colour we can dispense with the bulk of it. The projecting cornices and sills, the carving, and features generally, form so many shelves and nooks for the dust, dirt, products of coal combustion, and the unhydrated acids enveloped in them. The rain comes and washes the collected dirt against the brickwork, whilst the liquid acids proceed to eat away the stone. Besides, these big projecting cornices are for the purpose of casting deep shadows—the very last things of all that we want in our streets.

In tile-work we can reproduce this effect and count upon its loyal service, whereas in our stonework the effects of light get reversed by the soot, our high lights become the deepest blacks, and the soffits, that should be in shade, are the brightest parts of our mouldings. So that in a colour scheme, with tiles, the value of projections is got by patterns and particular dispositions of tint, and all that is wanted besides the tile-work are slips of some glazed material to act as boundaries to the fields of colour.

There is another virtue in tile-work besides its being imperishable and easily cleaned, and that is, that it is impervious to the elements. There is not the same necessity to load up our girders with thick masonry walls to keep out the weather. A thin glazed skin is sufficient for this purpose, and our walls will be drier and warmer as well. The ordinary brick wall is nearly as thirsty as a sponge-cake, and after a heavy rain-storm there is an immense amount of water to be vapourised before the walls can become dry and warm, and the weight of this water is considerable. With a glazed skin, beyond the comfort of unchanging temperature, so much firing to dispel water will be saved. Moreover, the rain, instead of dirtying the house, will help to clean it, and after each shower the bulk of the filth, disease germs and acids will be washed into the drains and be got rid of comfortably.

But there is more to be done with tiles in the way of external decoration than merely to put them on the fronts of buildings. There are bridges, walls and fountains to be considered.

Glazed brick makes an appropriate casing to the concrete arches of our modern bridges, and the spandrels might be most effectively treated with fine civic heraldry executed in tiles.

A Scheme for Improving Trafalgar Square.

Then as to our public places. Take Trafalgar Square as an instance. At present it is an arid waste, grey and ineffective, with various disconsolate grimy black statues attempting to ignore the presence of the two steaming fountains which mark significantly the proximity of St. Martin's baths and washhouses.

Let us imagine it taken in hand and made to serve some pleasant and and useful purpose, and, so far as we can, beautiful. We will begin by reducing the inordinate size of the basins to the fountains, and lining them with turquoise blue tiles, and by stipulating that for the future the fountains shall spout clear water. We lay the whole of the area, except a fringe to the south of the necessary paths, which shall be of Purbeck stone, with turf, and jealously keep the hoof of the loafer from off it. The statues shall be cleaned up and either kept clean by frequent scrubbing, or gilded. Gordon's statue should be moved nearer to the north wall, and the number of future statues permissible and their positions at once determined, so as to present an intelligible scheme: the wall serving for a background. This wall we will treat for the most part in plain colour, so as to form a quiet backing to the statues; but beneath the parapet we will have a row of hatchments, the arms of those who have done good service to the State and who were connected with that neighbourhood. Beyond and above this base of colour rises the National Gallery, made the richer by this coloured setting.

At present we quite waste our statues by the inappropriateness of the sites chosen for them. Standing in the midst of the confusion and turmoil of our crowded streets, they form pathetic objects, helpless in the torrent of the traffic, or else they are stranded against some building and absorbed in the conflicting detail of their background. The monument is made regardless of the site; and as nobody in authority seems to care, it is dumped down on the first convenient spot handy, where it may divide with overshadowing lamp-posts the duty of dividing the traffic and imprisoning the pedestrian.

The Internal Use of Tiles.

Of the internal application of tiles there is not much for me to say. A good deal has been done in this direction of a very interesting description, but by the nature of the case most of the examples were conditioned by special circumstances.

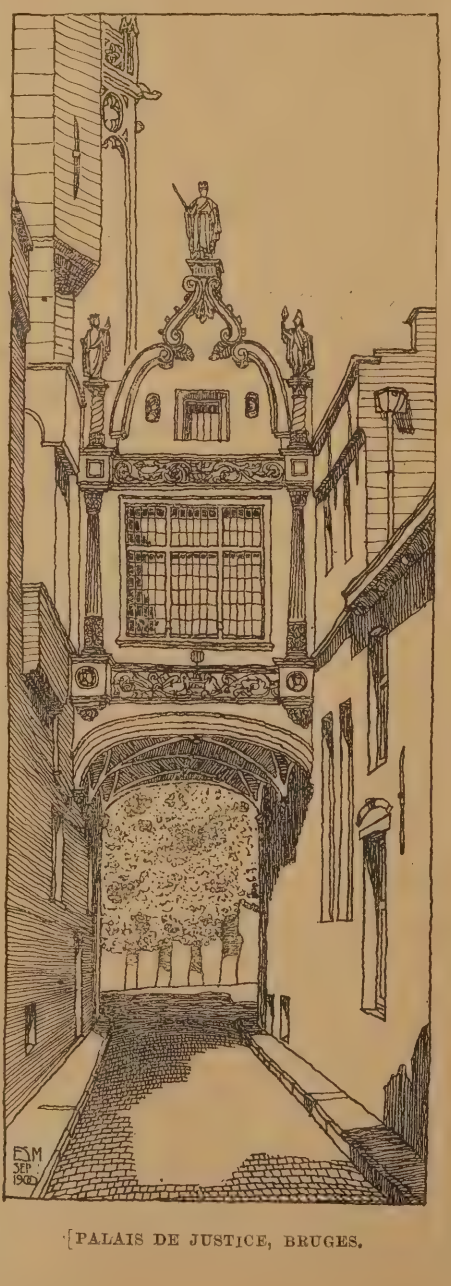
An early example of the decorative treatment of tile-work can be seen in the refreshment and grill rooms at the South Kensington Museum; and examples of Mr. Waterhouse's treatment of tiles may be seen in his various public buildings, banks and insurance offices. Mr. Butterfield, in several of his London churches, was also a pioneer in this species of decoration, though the tiles he used were for the most part those misnamed encaustic rather than the enamelled ones. Subsequently Mr. Aitchison built the Arab Hall for Lord Leighton, using for the most part the collection of old Oriental tiles that Lord Leighton had procured, and decorating the staircase hall with mainly new ones, but in admirable sympathy with the old. Outside the specimens of old tiles in the British and South Kensington Museums, a more beautiful example of Persian tiling is not to be seen in England. Leighton House also helps to dissipate the rather general idea that a tile-surface must look cold and uncomfortable, for nothing can exceed the air of protection and richness that even the plain tiles on the staircase give.

Since then the practice of using tiles for internal decoration has increased immensely, though more in what are known as business premises than in private residences. It is, consequently, for the external use of colour decoration that I would specially plead, and, for the decoration to be of a permanent kind, got either by enamelled tiles, glazed faïence or mosaic. The French have already made some excursions into this field, notably at the Paris Exhibition, and are still pursuing the subject of building in steel and terra-cotta. It is a matter, I think, of deep regret that at the South Kensington Museum, where so plucky a start was made in using materials that withstand our climate, and carrying them out with so much interest and beauty, there should now be abandonment of their spirited departure instead of development, and that they should have reverted to the tame respectability of stone. One might have hoped that in a new building, for new purposes, and on so large a scale, every opportunity would have been taken to advance one step further the architecture of the present day, and, since the occasion seemed so suitable, to erect an example of coloured architecture. The result of this stony disdain, this proud scholarship of our streets, is that we cannot live in them. Every evening thousands upon thousands escape by every railway from these masterpieces of correct architecture and superfine sculpture to the shelter of the country, where the earth is green about them and the heaven blue above them. Cannot we make our streets a little more kindly and comforting to those poor prisoners who cannot escape? We have tried mass and form and light and shade; might we not now have an attempt at colour?

A short discussion followed the reading of the foregoing paper. Mr. Lewis F. Day said, with regard to the Spanish work, that it was not realised how all the tile-work in the Alhambra was literally a mosaic of pieces of tiles, which were very soft and were thus able to be cut and filed up into shape. This treatment was also due to the fact that the workers had no means of obtaining various colours on the same tile. When they did arrive at that knowledge they proceeded to imitate those mosaics and produced tiles like them.—Mr. H. H. Statham remarked that wherever bright sunshine was, there bright architecture would be found; and wherever strong colour was used in the architecture, the employment of mouldings became restricted. Whilst agreeing with Mr. Ricardo that a greater use should be made of tiles in this country, he did not very much like the idea of a street architecture of glazed surfaces: and he made the practical objection which arose from the fact that different ownership of buildings in the same street would result in different treatments, and he was dubious of the means for harmonizing them. Perhaps, he suggested, the district surveyor of the future would, among his other qualifications, be required to possess an eye for colour, so that he might sit in judgment on any new scheme that came within his sphere?—Mr. Aumonier, who entirely supported the lecturer's opinions, failed to appreciate Mr. Statham's objection, remarking that in a garden of many flowers, though the colours were innumerable, yet there was always harmony and not discord.—Mr. Paul Waterhouse (who presided over the meeting) spoke of the use of lead in glazing, and drew attention to the battle which the Home Office was waging with manufacturers. By an increased use of tiles architects might be increasing the great moral evil attendant on lead-glazing, but more than one manufacturer had shown that it was possible to obtain equally good results without the use of lead, and their methods deserved our support

INDIAN ARCHITECTURE.

INDIAN architecture does not receive the attention which it deserves, considering what splendid buildings are included in that style. In this connection it is interesting to refer to the annual report of the Archæological Survey of Western India. Mr. Henry Cousins, the superintendent of the department, says of his visit to Mount Abu, which lies near the south-west extremity of the Aravalli range that divides eastern from western Rajputana:—The plateau extends some fourteen miles north and south, while in breadth it varies from two to four miles. Towards the southern end lies the civil station. About a mile to the north are the Dilwara temples. This group consists of four principal temples, each with its subsidiary shrines and corridors, contained within its own enclosed quadrangle, as is the usual arrangement with the Jains. They are constructed almost wholly of white marble, quarried in the plains below, and brought up miles of rugged hillside by some means we are now altogether ignorant of. The amount of ornamental detail spread over these shrines in the minutely-carved decoration of ceilings, pillars, doorways, panels and niches is simply marvellous; the crisp, thin, translucent shell-like treatment of the marble surpasses anything seen elsewhere, and some of the designs are dreams of beauty. Amongst all this lavish display from the sculptor's chisel, the two great domical ceilings of the halls of Vimala Sah's and Tejahpala's temples attract most notice and come in for most praise. Within each of these great ceilings, arranged in a circle, are sixteen female bracket figures, goddesses known as the sixteen *Vidya-devis.* There are some curious figures in the corners of some of the smaller ceilings, half-human, half-bird, with magnificent florid tails. These are *Gandharvas*, or celestial musicians, with their pipes and cymbals. In the older temple—that of Vimala Sah, which, an inscription tells us, was built in A.D. 1032—the pillars of the hall are of the same type as those in the hall of the Temple of Ambarnatha near Kalyan, which is dated A.D. 1060, and are all of a uniform pattern. But in the Temple of Tejahpala, built about 200 years later, the architects had lost the early vigour of well-established forms; they allowed themselves a freer fancy, and we find them indulging in very nondescript and whimsical designs. The general plan of the later temple has been copied from the earlier, and so has the great dome in all save the bolder innovation of the heavy massive pendant in the centre. Though the detail work of these temples is exquisite, and the designs are not only novel in their treatment but extremely pleasing to the eye, yet the setting of the work is at fault. The general outlines of the buildings are not in the best proportions. Such large domes as these two principal ones of Vimala Sah's and Tejahpala's temples are set too squat; they require greater height. Although the interior of the temples and courtyards are kept scrupulously clean, their surroundings are certainly not so, and the filthiness in some places is a disgrace to the Jaina community.



[PALAIS DE JUSTICE, BRUGES.

New Patents.

These patents are open to opposition until February 31st.

1900.—Sewage Purification.—23,412. D. Cameron, 1, Sylvan Road, Pennsylvania; F. J. Commin, 7, Bedford Circus; and A. J. Martin, Bradninch House: all of Exeter. This invention relates to the aëration of the sewage effluent by causing it to fall through the air from the edge of a trough fixed above the filter. Instead of fixed aërators, rotary sprinklers are used, such as are used for watering lawns. The invention also includes improvements in the alternating gear and other details.

Slide-Rule for Timber.—23,627. R. L. Jennings, 114, Colum Road, Cardiff. This rule, which consists of a disc having two rotatable flat rings of brass or aluminium, combines five logarithmic scales for the purpose of quickly computing the measurement weight of deals, flooring boards, &c., and also for cubing timber.

1901.—Cistern Disinfecting Apparatus.—1,833. A. G. O'Brien, Machon Bank, Nether Edge, Sheffield. Above the cistern is fixed a funnel-shaped receiver having a depending tube with a basket at its bottom end (within the cistern). The receiver is filled with a disinfectant in powder form and a charge automatically falls into the basket after each discharge of the cistern, this being effected by a pair of cut-off plates which are attached to and operated by the main lever.

Water Taps.—4,124. F. N. Mackay, Holly Bank, 4, Nicoll Road, Willesden, London, N.W. On the pressure side of the valve-seat the tap is provided with a spring-controlled supplemental valve, which rises and checks the supply to the tap when the main valve is removed. The washer can thus be renewed without necessitating the shutting-off of the water from the main.

Girder Coverings.—5,257. B. Jacquart, South River, Middlesex, New Jersey; and J. F. Booraem, 1, Madison Avenue, New York, U.S.A. The girder is entirely covered by a brick on either side and a bottom brick (preferably enamelled), all interlocking. Similar bricks cover the span.

The following specifications were published on Thursday last, and are open to opposition until March 8th. A summary of the more important of them will be given next week. The name in italics is that of the communicator of the invention.

1901.—32, Cook, guards for wood-working machines. 70, Harris & Hawes, radiators. 361, Shanks & Simpson, lavatories and urinals. 942, Crellin, apparatus for raising, lowering and transporting machinery. 2,098, Thorpe, windows, sliding panels, &c. 2,975, Dewhurst, means for connecting filters, pipes, &c., to taps, 3,348, Pridmore, door-knobs. 4,249, Anderson, cranes. 4,366, Bellamy, Turner & Hardman, safety devices for the trolley poles of electric cars. 14,333, Karfunkelstein, gas soldering irons. 18,032, Spatz, waterproofing and drying walls. 18,677, Dawson, apparatus for detecting leaks in drains and other closed systems of pipes. 19,017, Green, channels and terminals for inspection chambers. 19,683, Schulze, baths. 20,023, Taylor, excavating machines. 20,839, Lepper, taps and cocks. 22,320, Haddan (*Brown Hoisting Machinery Co.*), corrugated material for roofs, walls, &c. 23,404, Kett & Hossenlopp, coverings for the floor openings of lifts.

The Palais de Justice at Bruges is just beyond the cottage at Notre Dame illustrated on p. 409 of this issue. The back view of the building towards the fish-market and canal is the most picturesque. The front is very elaborate, being decorated with gold (the accompanying sketch up the passage between the Hôtel de Ville, by Mr. E. Stanley Mitton, gives one an idea of it). The council-chamber of the magistrates is particularly noteworthy. It is antique (though the rest of the buildings date from 1722), and contains a magnificent oak chimney-piece occupying nearly the whole of one side of the room, and dating back to 1509. On it are carved statues of Charles V., Mary of Burgundy and Maximilian, Charles the Bold and Margaret of York, his third wife, surrounded with coats of arms of Burgundy, Spain, &c. It has also marble bas-reliefs representing the story of Susannah.

Views & Reviews.

Early Christian Art.

This book, written by an American scholar, is a most important contribution to the history of the monuments of the early Church, comprising in its scope all branches of Christian art and archæology. The period covered is from the second to the sixth century inclusive. In this work the author, we think, conclusively shows that the early Christian art was not, as has often been assumed, new and original in its form, produced by the complete dissociation of religious thought and ideals from the Roman; but, like the religious conceptions, was based on the other, the early Christian congregations being no more able to separate themselves from the current thought of their age than we are from this. In course of time the differences in view made the most momentous changes in form, and the importance of studying this early art is to trace its effect in the evolution of the Romanesque and Gothic styles. This book does not, of course, pretend to follow the subject into these later stages, but wisely confines itself to clearing up the illusive ground of the early beginnings, and the author, having unravelled the tangled skein, leaves to others the joining on of the later forms to the now clearly visible ends. Mr. Lowrie, we are thankful to say, is not critical of this rude art, but contents himself with collecting material and presenting it in historical form. The book deals very thoroughly with the wide range which the subject covers, treating of cemeteries; architecture; pictorial art, including paintings, sculpture, mosaics and miniatures; the minor arts; and civil and ecclesiastical dress. In the architectural chapter the author traces the church plan as derived from the plan of a Roman house. It is certain that the earlier meetings must have taken place in houses, but it seems somewhat far-fetched to argue any close connection, seeing how diverse were the plans of actual churches. It would seem that the plan was more a product of the form of ceremonial.

"Christian Art and Archæology," by Walter Lowrie, M.A. London: Macmillan & Co., Ltd., price 10s. 6d.

British Sculpture and Sculptors.

Mr. Spielmann must be congratulated on having seen a want and met it. True, this book is primarily for the public, but of course any book would be of little practical use to a sculptor. The chief purpose of a book on British sculpture is to give interesting biographical details of sculptors and to record their chief works; and it should be made interesting and entertaining to the public appealed to. The illustrations in this book are well reproduced in the majority of cases, though the black backgrounds generally make a piece of sculpture look lifeless and cold. Every living sculptor of note is mentioned. In the introduction several contentious subjects are touched on. Mr. Spielmann thinks that if several colours are applied to sculpture they clash and weaken it, but that a single colour throughout does not decrease from its dignity. If imitative colour is indulged in on a statue, of course the work is at once degraded, as it pretends to be what it is not; but if the work is of decorative character, decorative colour is perfectly justifiable. As long as the colour takes its place in the fulfilment of a logical idea all is satisfactory, and the successfully coloured sculpture is entitled to be held higher in the scale than monochrome, in virtue of its possession of another powerful element.

Stress is laid on the degrading influence of clay-modelling on sculpture in stone or marble, by making the forms plastic rather than glyptic. It is here that we find the traditional architectural sculpture of the Gothic, Roman, Greek and Egyptian periods was superior in some respects, the idea not then being inharmoniously rendered by overpowering the technique. Of course clay is most useful for sketching out, but the difference between glyptic and plastic art must always be borne in mind, and, indeed, in working in metal even the material must rule the forms.

The bane of "Committees" is dealt with vigorously, and should do good. Mr. Spielmann, we are glad to see, recognizes that an architect should control the sculptor where the latter's work is subordinate to the building, and *vice versâ* where the sculpture is monumental and to be supported by the building, but of course the two should closely co-operate. The best work will never be done, however, except by each knowing a good deal of the other's art. Architecture is indeed but sculpture on a large scale, and both must be organic.

"British Sculpture and Sculptors of To-day," by M. H. Spielmann. London: Cassell & Co., Ltd, price 5s.

Egyptian Archæology.

All those interested in Egyptian archæology will find this dictionary a most useful addition to the books on the subject. There is a great fascination in the remains of ancient Egypt, and every year the labours of Prof. Flinders Petrie and others are adding to our knowledge and bringing back to us some conception of that wonderful bygone civilization. To most it has been very difficult to interpret something from such objects as are in the British Museum, by reason of the want of a small dictionary that could be placed in the pocket. This book now accurately fills that want. It is profusely illustrated with small figures giving the hieroglyphs for the words where necessary. We would suggest, however, that a fairly long list of hieroglyphs should be given, as it would save going to other volumes not so easy of reference. The book will undoubtedly be of very great value to those travelling in Egypt.

"A Concise Dictionary of Egyptian Archæology." By M. Brodrick and A. Anderson Morton. London: Methuen & Co., 36, Essex Street, W.C., price 3s. 6d.

MR. HAITÉ ON MODERN DECORATION.

IN the course of the lecture on "Decoration, its Methods and Materials," which he delivered recently to the Northern District of the Institute of British Decorators, in the Museum Galleries of the Manchester School of Art (Mr. J. H. Reynolds, director of the School, occupying the chair), Mr. G. C. Haité said he must assume his audience to be conversant with the lecture delivered by him at Sheffield on November 28th last, when he dealt with the subject of decoration from a historical point of view (reported in our issue for December 4th); and he must also assume that he was addressing an audience of decorators. Trustworthy decorators were very much needed to-day; and it behoved every master-decorator and every workman to make himself trustworthy. There ought to be the desire on the part of every decorator to do better work than his rivals; and such a desire was very laudable. He should always be ready to learn and be open to conviction, but very slow to adopt eccentricities. The connection between architecture and decoration was also of the greatest importance, and decorators should carefully study this relationship. Unfortunately, in many cases of domestic decoration with which one had to deal there was no architecture worthy of the name; and to that extent the decorator had nothing to work upon. This brought one face to face with the fact that the architect often entirely ignored the decorator and his work; and by his influence retarded the progress of decorative art, instead of advancing it, as he should.

There was much that was repulsive to good taste in the misapplication of the principles of form and colour in pictorial and decorative art, in jewellery, and even in advertising posters. It really seemed in the last direction that an official censorship was necessary. It was anomalous that we should have a censorship of plays, for instance, and no supervision of what passed as art in many of our public places. Bad decoration was, however, supposed to entail no consequences. The lecturer pointed out some of the consequences of bad construction in architecture, in engineering and in furniture. It was just as desirable that those who gave expression to bad decorative art should also suffer. Again, while people were willing to take the advice of specialists in most things, almost everyone considered himself a decorative expert. True, there was a small class of people willing to be advised as to what was good for them in matters decorative, but the great majority were not.

Mr. Haité spoke at some considerable length on the principles of ornament. Some persons ridiculed the idea of laws in decoration. Applied art, however, depended on law. The essential principles, underlying everything else, were fitness and beauty. Their application must be fit as to time, fit for the place, fit for the object decorated, and fit as to the medium employed. He enumerated some of the laws which were interpretations of the principles referred to: symmetry, balance, proportion, spacing, subordination, repose, radiation, contrast, repetition, rhythm, &c. Beauty might be defined as a harmonious co-operation of many pleasing qualities.

Decoration was subject to many limitations, and often these limitations were positive advantages. Take, for instance, the Moorish prohibition of the imitation of Nature. As a result of that we had the use of many forms showing very beautiful results. The limitations imposed by lines in lead-light work were an absolute necessity, yet, once recognized, what possibilities arose in their use. In stencilled ornament, the fact of having to use ties imposed certain limitations; yet, when properly employed, ties greatly enhanced the effect of the ornament.

Coming to essentially modern forms of decoration, he said there appeared to be two schools of thought, one of which would prohibit the use of many examples of manufactured goods, believing that the true sphere of the decorator was in the production of ornament in the flat; and the other recognizing that the goods made ready to hand were a product of the time, and their use, as such, quite appropriate. The first idea implied that every executant should be a designer, and he was in favour of this if the men could be found. We must differentiate between a designer and a house-painter, for design required a master-hand. He would urge upon all decorators the desirability of having their own private designs prepared for them by competent designers. Such men could offer great advantages to their clients.

Speaking of the many relief materials now in use, the lecturer pointed out numerous decorative possibilities open to the decorator. These materials were put into his hand in an incomplete state, and left for him to finish. By a wise selection and use of these materials good effects might be produced.

With the aid of a lantern and specially-prepared slides, many suggestive arrangements of these materials were illustrated.

Engineering Notes.

The Electric Light Installation at the Northern Hospital has cost the Metropolitan Asylums Board £11,781 4s. 4d.

The Mission Hall, Rugby, has been fitted with the latest improved hot-water heating apparatus by Messrs. John King, Ltd., engineers, Liverpool.

The Corporation Temporary Hospital, Southport is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

New Tube Railways.—Three Bills are to be introduced in this Parliamentary session, namely, the London United Electric Railway Bill, the Charing Cross, Hammersmith and District Electric Railway Bill, and the Piccadilly and City Railway (No. 2) Bill, all of which threaten in some way Hyde, St. James's and the Green Parks by proposed tunnels under them. It is feared that the existence of tube railways beneath the surface will cause injury to the flora. It is suggested that the plan of running under the parks is due to a desire to avoid possible claims by owners of buildings, on account of vibration. A Bill will also be promoted this session for the construction of an underground electric railway from the City to Wimbledon. The proposed line will begin within twelve yards of Cannon Street Station, and will pass under the Thames to Southwark, from whence it will proceed, viâ Lambeth and Wandsworth Road, to a point near Clapham Junction. From this district it will run viâ St. John's Hill to Wandsworth, and from thence to its termination at Hartfield Road, Wimbledon.

Shillelagh Water-Supply.—Earl Fitzwilliam has provided at his own expense a water-supply to Shillelagh. Before this the people had much difficulty in getting pure water, several sources having been condemned as dangerous to health.

The Westminster Electric Supply Corporation, Ltd., have reduced the price for energy used for power purposes to half the lighting rate. The rate is now, for the first 4,000 units used in each year, 3d. per unit. For all units used in each year in excess of 4,000, 2d. per unit. These rates are subject to a discount of 8 per cent.

Liverpool's Water Supply.—The Liverpool City Council last week adopted a recommendation by the Water Committee that a second line of pipes be laid between the city and Lake Vyrnwy, in Wales, the chief source of the present water-supply. The work will involve an outlay of £785,000.

The Leith Dock Commission propose to improve the shelter and accessibility of Leith Roads, and at the same time assist the flow of the tidal current, on which the maintenance of the depth depends, by carrying out, at a cost of £135,000, a breakwater 3,770ft. in length along the reef of rock from the south point of Inchkeith, and to remove the Hermit and the Little Hermit rocks, &c. The whole estimated cost of the work amounts to £325,000.

Electric Traction between Tooting and Westminster.—The work of laying the conduit system of electrical traction on the Tooting and Westminster route will be commenced in the middle of March. The contract price is £171,000, and it is hoped that the new cars will be running in about ten months' time. In all probability operations will be started in the southern district. The work will be done in sections, from which the ordinary horse tramway traffic will be diverted until they are completed. Generally speaking, there will be no night operations, which are twice as costly and half as efficient as day work.

Southend Improvements.—The Southend Town Council has sealed an agreement with a syndicate for the construction of a large water chute on the east side of the pier, the rental to be £1,000 per annum. A suggestion has been made for utilising the tide, by means of an extensive inland lake, for generating electricity for driving the tram-cars and lighting the borough and the adjacent towns of Rochford, Shoeburyness and Wakering. There is also another suggestion for constructing a double tunnel about a mile long from the shore end of the pier for continuing the trains to the terminus of the Great Eastern Railway or a station midway connecting the Tilbury and Midland lines.

A New System of Steel Manufacture.—The Frodingham Iron and Steel Co., Lincolnshire, which has successfully worked the open-hearth basic steel-making process for eleven years, have just commenced the working of a 100 tons Talbot continuation process furnace. It is the first of its kind in Europe, and with the exception of a small experimental furnace in America is the only one in the world. The inventor of the furnace is Mr. Benjamin Talbot, a native of Shropshire, who received his preliminary training in England before going to the United States. The principle is a combination of the open hearth worked on the continuous process. The bath of molten metal in the furnace is worked up to a certain point, and then a portion of the steel is poured out, the charge in the furnace being then made up to its normal strength by molten iron taken up in ladles from the adjoining blast furnaces and poured into the furnace. The furnace will be tapped, or, rather, a portion of the steel will be taken from it, at very short periods, probably about every four hours, and this will constitute a very rapid process of manufacture. The furnace is a Wellman tilting furnace fitted with an electric charger. The whole is worked mechanically. There is an electric crane, and even the doors are lifted by hydraulic power. The builders are Messrs. Tannett, Walker & Co., of Leeds.

Scarborough Town Hall.—Application is to be made to the Local Government Board by the Scarborough Corporation for power to borrow £3,075, in addition to the £14,000 already authorised, for the adaption of St. Nicholas House for the purposes of a town hall and public offices.

Law Cases.

Definition of "Adjoining Premises."—The case of *White* v. *Harrow—Harrow* v. *The Marylebone District Property Co.* recently came before the Court of Appeal. The plaintiff White is the lessee of No. 24, High Street, Marylebone, for a term expiring in 1932. In 1899 he demised the house to the defendant Harrow for a term of twenty-one years, and the lease contained a covenant by the lessee that he would not do anything which might "interfere with the quiet enjoyment of any adjoining or neighbouring premises." The Marylebone District Property Co. have acquired an interest in property adjoining No. 24, High Street, and they were proposing to erect thereon some buildings which, as Harrow alleged, would obstruct the access of light hitherto enjoyed by his premises. He accordingly brought an action to restrain the company from building, and White, who is also interested in the company, took proceedings to restrain Harrow from prosecuting his action, on the ground that it constituted a breach of the above-mentioned covenant, and he moved for a stay of proceedings in that action. Their Lordships allowed the appeal. Lord Justice Vaughan Williams said it had been contended that upon the construction of the particular covenant in question the words "adjoining premises" extended not only to buildings which came in physical contact with the demised building, but also to any buildings which were situated near enough to obstruct easements. He could not agree to that construction. He thought that "adjoining" meant "adjoining" in the sense in which the word was used in the London Building Act, 1894.

Clauses in Specifications.—The case of *Hobbs* v. *Turner* recently came before the Court of Appeal. The plaintiff sued the defendant for £27 10s. for metal work supplied for a house which the defendant was having built for him under the supervision of Mr. J. L. Williams as architect. By the contract, which was in the form issued by the R.I.B.A., the builder undertook to do certain portions of the work, and as to the other portions provisional sums were specified. The specification contained this clause: "Provide and fix iron balcony railings to design (allow £50 for this irrespective of carriage, fixing and profit)." In consideration of the sum of £4,700 the builder agreed to execute and complete, subject to the conditions in the schedule to the contract, the works described in the specification. He was not necessarily to execute the whole of the work, but the building owner might get other persons to do certain parts of the work, and as against the builder certain fixed sums only were to be paid out of the lump sum to those persons for that particular class of work. He could only allow as against the builder the fixed sum for each class of work. That being so, clause 28 of the conditions seemed to the Master of the Rolls to contemplate payment for this class of work being made either by the builder or by the building-owner, and the last part was based on the hypothesis that part of the work might be done by the builder and part not done by him, and where any such work was not done by the builder the building-owner would be entitled to hold back the amount specified for that work. This clause was obviously framed upon the footing that the building-owner was liable for this particular class of work. In his (the Master of the Rolls's) opinion, when one looked at the whole of the contract taken together, the proper inference as regarded this particular class of work was that it was intended that the building-owner, and not the builder, should be the principal. If the builder entered into a contract for any of this class of work he might make himself liable to the tradesmen or artist; but, as he was acting under the general scope of the contract, he would be acting as the agent of the building-owner and would create privity of contract between the building-owner and the tradesman or artist. That could only be got rid of by the tradesman or artist contracting with the builder in such a way as to debar himself from resorting to the building-owner. Nothing of that kind occurred here. What happened was that the plaintiff was put into relation with the defendant through the architect, and, though this was not clear, he understood that the order was given to the plaintiff by the architect. It seemed to his Lordship that the initial liability of the defendant in respect of this class of work was established, and that all the parties dealt upon that footing. The judgment of Mr. Justice Kennedy was, therefore, right. Lord Justices Romer and Mathew agreeing, the appeal was dismissed.

THE DOME AS AN ARCHITECTURAL FORM.

THIS was the title of the paper which Prof. Baldwin Brown read before the Edinburgh Architectural Association last Wednesday (Mr. Henry F. Kerr, president, in the chair). The purpose of the paper was to bring into view the general æsthetic character of the dome, and more particularly to vindicate for it a place among the architectural forms suited for a Christian church. The lecturer said that the main characteristic of the dome in general was its embracing uniting quality. Its employment as a mere roof, as in the multiplied domes of later Byzantine churches, such as St. Mark's at Venice, or the series of cupolas along a rectangular aisle, as in churches of the west of France, was not the way to secure all the advantages of that most beautiful and expressive feature. The dome, wherever it appeared, lent distinction to a building, and it had been rightly pronounced to be on the whole the most satisfying to the æsthetic sense of all architectural forms. The real power of the dome was, however, only exhibited when it was made to exercise an influence far beyond the limits subtended by its own circumference, and brought into harmony the complex elements of a sub-divided plan. The Pantheon of Hadrian at Rome, the starting-point of the development of dome-construction in the modern world, completely embraced the spaces of the plan it surmounted, but this plan was not that of a regular unbroken circle. The Christian builders desired to use the dome for their own purposes; but such a plan as that of the Pantheon was not suited for a Christian meeting-house. One of the most interesting chapters in the whole history of architecture was occupied with various experiments made by early Christian architects to adopt the dome to plans suited to the requirements of congregational worship. The efforts to overcome the difficulties which presented themselves were sufficient proof that they recognised the dome as a form not only beautiful in itself but expressive of Christian ideas, and this was a consideration too often lost sight of by the mediævalists of to-day, who, as the discussions connected with the new Liverpool Cathedral had shown, were still dominated by the ideas embodied in the Gothic revival of the first half of the nineteenth century. The efforts referred to were ultimately crowned with success, when the architect of Justinian's Church of Sta. Sophia at Constantinople combined the dome with the rectangular ground plan normal in the Christian meeting-house. It was a curious fact that after Sta. Sophia the planning of domed churches retrograded, and small cupolas were multiplied over the arms and intersection of Greek crosses, or distributed like the five on a dominoe over a square. Some later Turkish mosques seemed, however, to show a revival of the Sta. Sophia tradition. Meanwhile other points of interest in the history of dome construction emerged, the chief of which was the employment of the cupola in later Byzantine architecture, and again at the Renaissance as an external rather than an internal feature. There was a fine field open to the efforts of the modern designer in the direction indicated by Sta. Sophia. The triapsidal plan, that could be effectively combined with a central dome, offered opportunities for experiments, and these might result in a centralised church for congregational purposes, free from the suggestion of mystical sacerdotalism which clung to the mediæval fane, and recalling the glories of some of the early Christian domed structures that had passed away. If architectural students who went to Cologne would shorten their stay in the Gothic Cathedral, and spend more time in St. Mary of the Capitol or the Apostles' Church, some fresh and promising elements might be imparted into the church architecture of the day.

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Supplement to
The Builders' Journal and Architectural Record,
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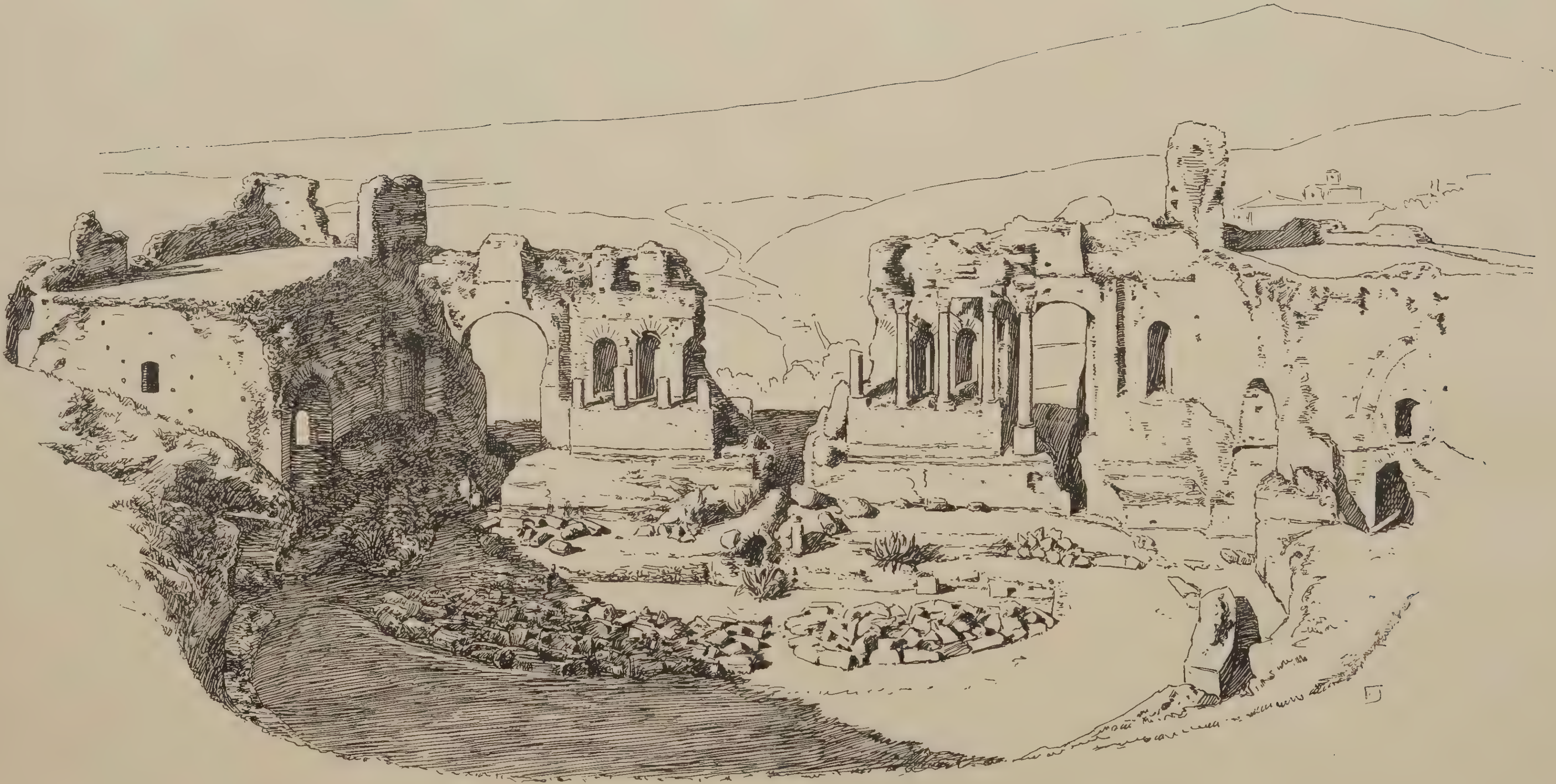

THE GRECO-ROMAN THEATRE, TAORMINA. Drawn by F. Hamilton Jackson, R.B.A.
(In illustration of "Sicily and its Architectural Monuments," p. 410.)

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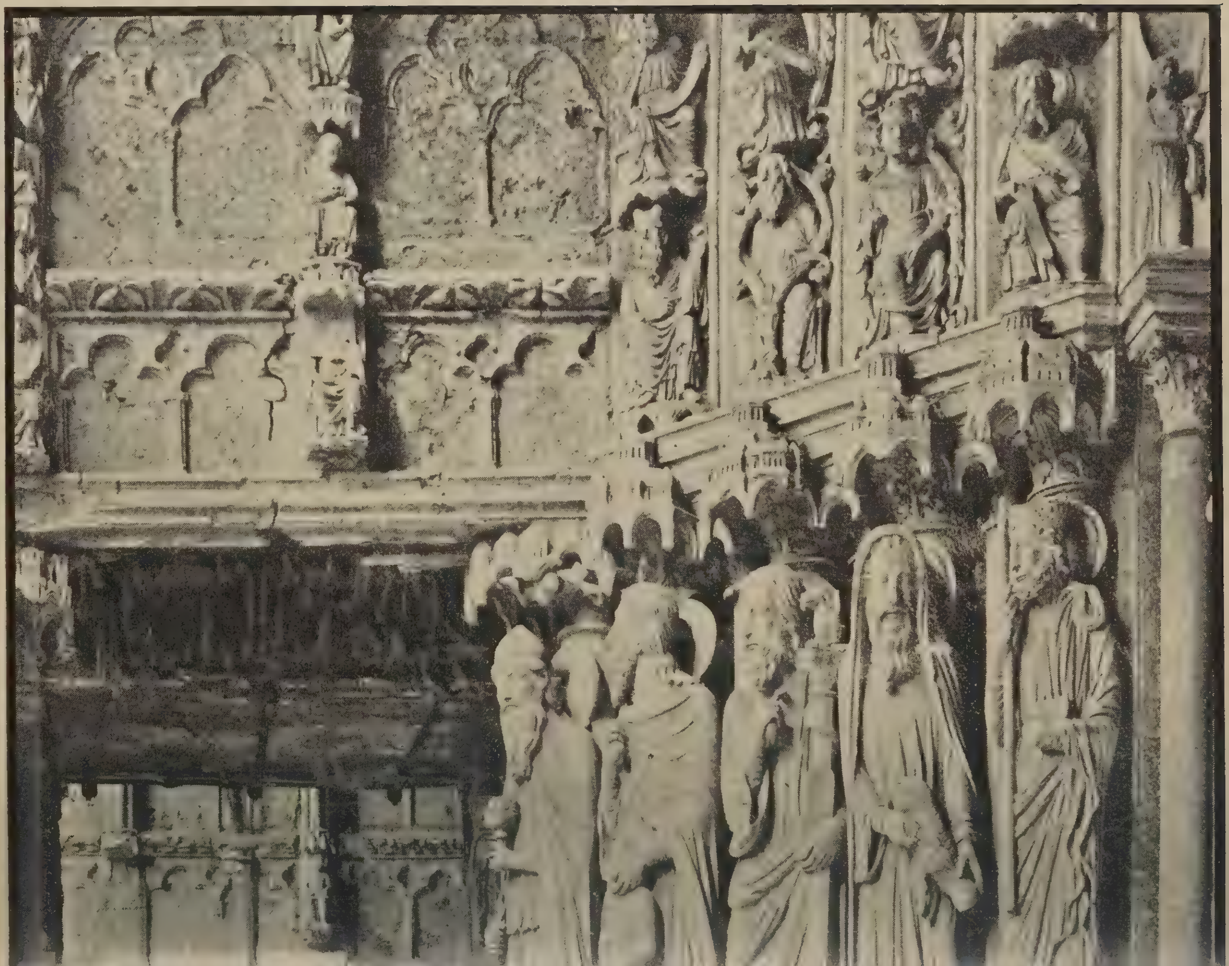

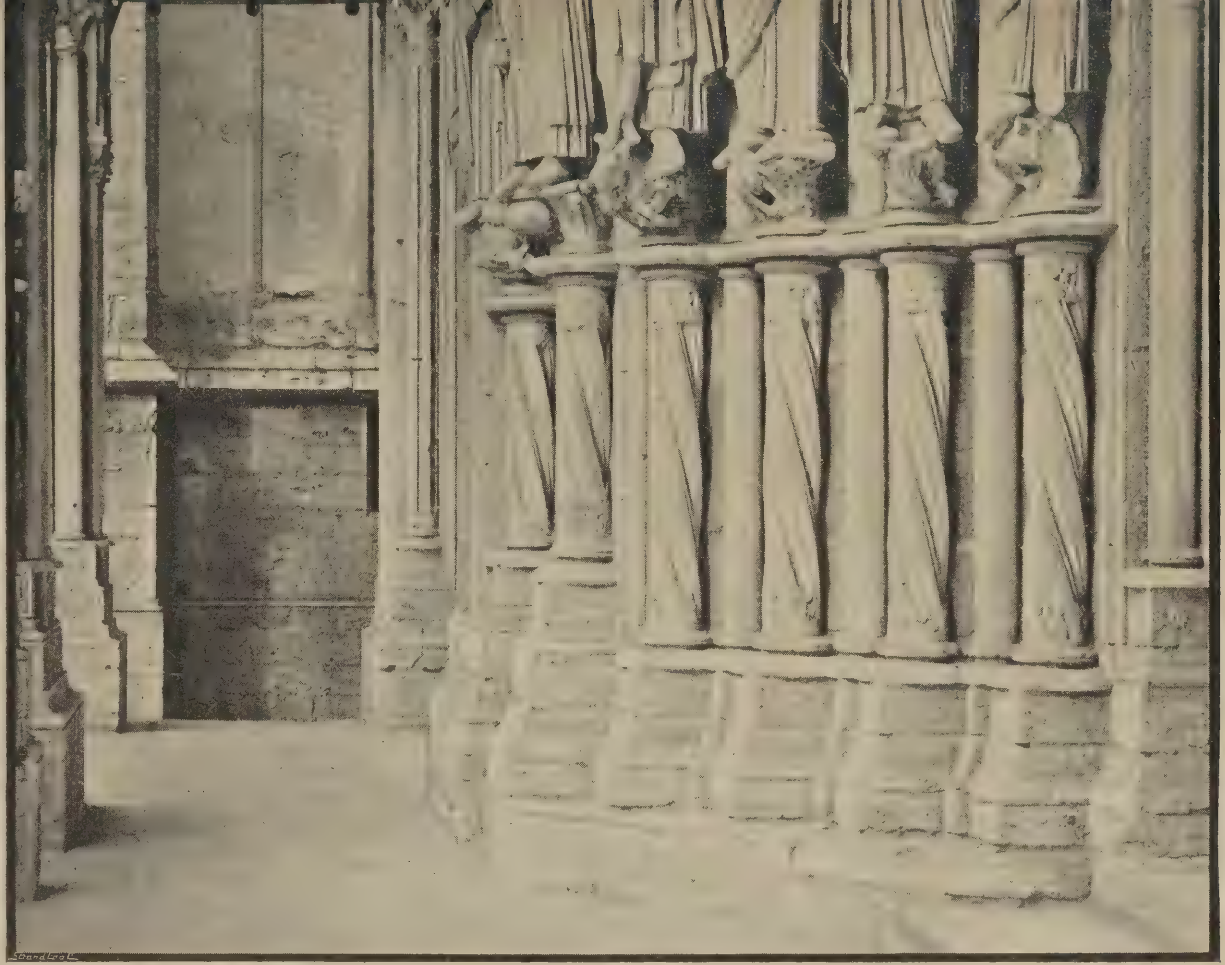

CHARTRES CATHEDRAL: DETAIL OF CENTRAL BAY OF NORTH PORCH.

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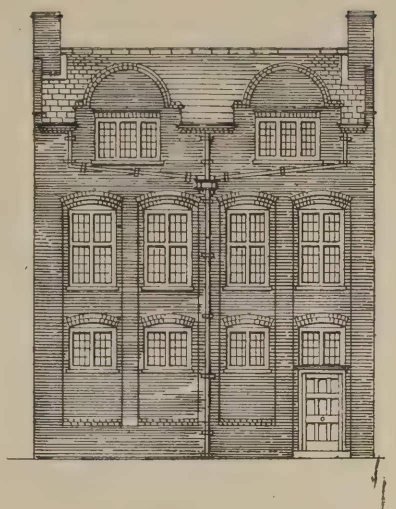
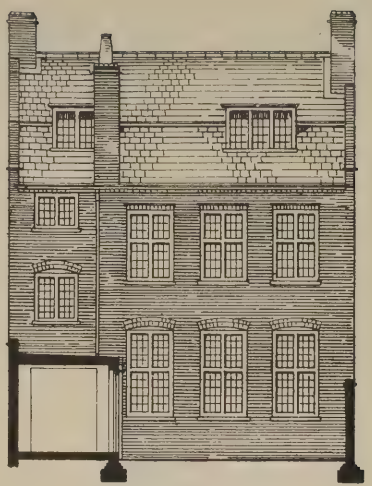
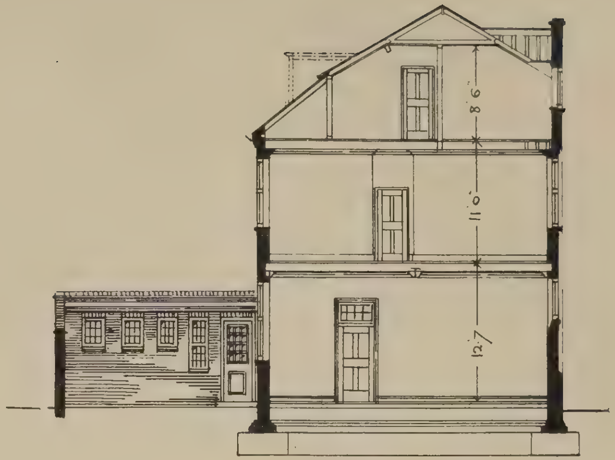


Elevation to Cornwall Road

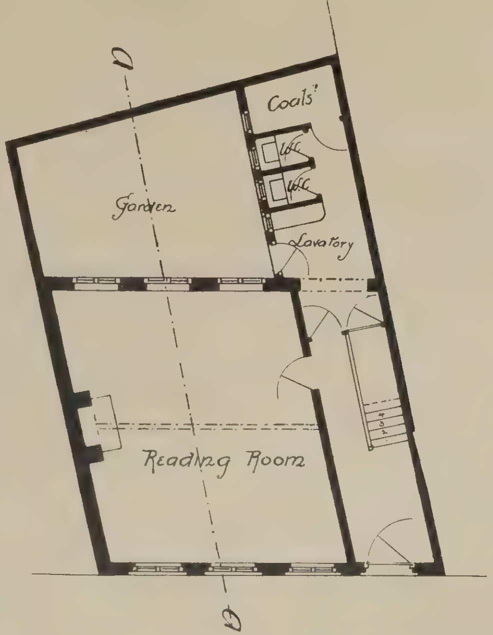


Back Elevation.

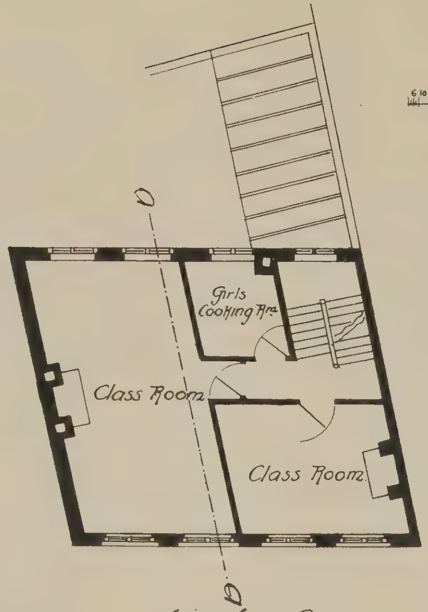


Section upon line a..a.

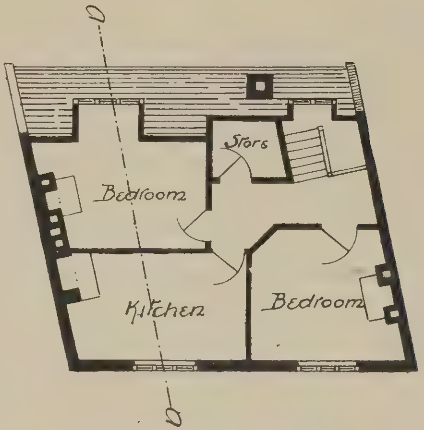
Scale



Ground floor Plan



First floor Plan.



Second floor Plan

THE ROEHAMPTON CLUB FOR WORKING GIRLS, CORNWALL ROAD, LAMBETH, S.E.   W. G. HORSEMAN, Architect.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Claim for Alleged Violation of Contract.

NEWPORT, MON.—NAIVETE writes: "A accepts tender by B (of £36) to execute some alterations to A's premises. A complains that parts of the work are not done according to specification, and also informs B of certain damage to his premises. B in reply sends A an account and requests a cheque in settlement. A sends a cheque for two-thirds of the amount of B's tender and points out the work not done according to specification. B contends he has finished the work, but, as regards the damage, offers £ as an indemnity. Can A legally claim from B the cost of finishing the work and repairing the damage done? Also, can A legally claim reasonable expenses in preparing professional and other evidence? Can B claim the full amount of his tender?"

I am of the opinion that a binding contract exists between A and B—B to do certain work according to certain plans and specifications furnished him by A, and A to pay him when the work was completed according to these specifications. You do not state what is the damage alleged to have been done to A's premises by B, nor the alternatives he proposes for B's acceptance; therefore I am unable to say whether or not they are reasonable. B, on the other hand, alleges that he has finished the work according to contract, and offers a certain sum to A to cover the damage. For the reasons above stated I am unable to say whether this offer is reasonable or not; neither is it stated whether or not B's offer was made "without prejudice." The question as to whether A can, in the event of B refusing or neglecting to complete the work, complete it himself depends on the question of fact whether or not the work as it stands is complete according to the contract. No data has been given which would enable me to form an opinion on this part. If the work is not complete, and if the time (if any) fixed for completing it has expired, or, in the event of no time being fixed, after the lapse of a reasonable time—and in either case after due notice to B of A's intention—A can, in my opinion, complete the work himself and afterwards recover the amount from B or deduct it from the balance payable to B in his hand. I gather from the facts submitted that B's offer was *not* in respect to damage for non-completion of the contract but was offered in liquidation of damage caused by him to A's property irrespective of the contract. If A's contention that the work is unfinished is upheld in court he will of course be entitled to all costs of suit. From the amount of B's tender I gather the amount in dispute to be small, and suppose A will proceed in the county court; but before incurring expense for preparing professional and other evidence he should consult a solicitor.

W. JOHNSON-ROBERTS.

Book on Ventilation and Heating.

BIRMINGHAM.—G. H. L. writes: "What book would you recommend as trustworthy and practical on hot-water supply to domestic buildings; and also what book on heating and ventilation? I do not want a small text-book."

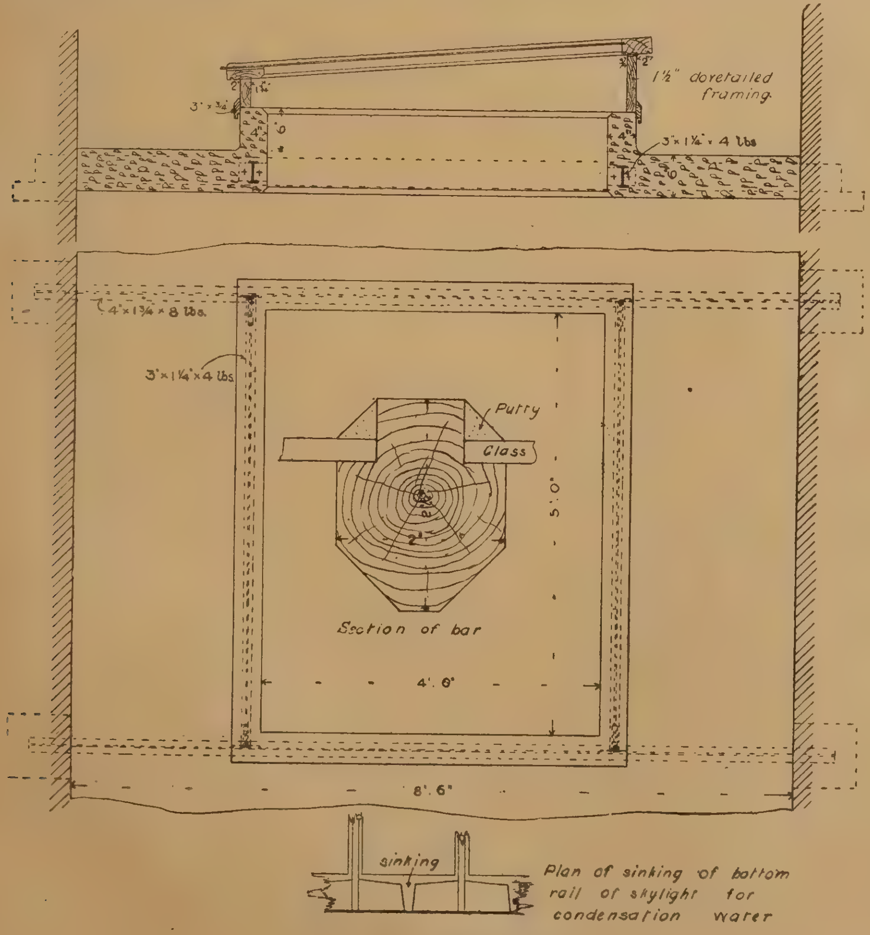
"Ventilation and Heating," by J. S. Billings (B. T. Batsford, 25s. nett).

Skylight on Cement Flat.

LONDON, N.—QUERIST writes: "Please give details of a skylight on a cement flat."

The accompanying illustration shows a cheap skylight arranged as requested on cement flat. The larger rolled joists should be about 5ft. centre to centre throughout, but may be widened a trifle at the skylight. The concrete should be, say, 5 ballast to 1 of cement, and the centering should remain at least a fortnight after completion.

HENRY ADAMS.



SKYLIGHT ON CEMENT FLAT.

Powers of Urban Council to Enforce Repairs.

FLEET.—DOUBTFUL writes: "Has the local authority the power to compel owners to close property and still levy rates on it? Having some old dwellings in the suburbs of an urban district, I was induced to sign a form in which I agreed to pay the local rates (reduced), whether the houses were occupied or not. I have now received a notice under the provisions of the Public Health Act, 1875, and the Housing of the Working Classes Act, 1890, to do certain repairs (not stated), or am threatened with proceedings. Supposing I elect to close the houses, would I still be liable for the rates, or would it be necessary to pull the property down entirely to get rid of this incubus?"

Owing to the fact that you signed an agreement to pay rates, whether your premises were let or unlet, in consideration of being charged a reduced rate, you are placed in a very awkward position. As far as I can see your sole defence is that the premises have ceased to be houses, *i.e.* habitable houses, and consequently should not be rated as such, and that you should not be called upon to pay rates on them as houses. In order to sustain this contention you would have to show that the houses were not fit for human habitation. The only way I see you could expeditiously do this would be by applying to the justices to have the houses closed as unfit for human habitation, or agreeing to such an order being made at the suit of the sanitary authorities. Even then you would not be out of difficulties, as you would have to get the rating adjusted on this proviso. When all this is satisfactorily accomplished a considerable amount of money and time will have been expended. This brings us to the question, would it not be better for you to execute the repairs required by the sanitary authorities? In answering this question I may premise that the sanitary authorities *very* frequently request repairs, &c., to be executed which are entirely beyond their powers, and which are, moreover, quite unreasonable and possibly unnecessary. It appears in this case that the sanitary authorities have not stated what repairs they require. You should write to them requesting to be furnished with full particulars, and stating that you are willing to execute all proper and reasonable works. If in the face of this they refuse to state what they want, let them proceed. Attend at the hearing before the magistrate and state that you are and were quite willing to do what is necessary to the premises, but that the sanitary authorities will not inform you of their requirements. If you state your case properly I have no doubt the magistrate will rule in your favour. On the other hand, if the sanitary authorities furnish you with particulars of what they require to be done, you should communicate with a solicitor to advise you as to its legality. Unless the premises are in such a condition that they are absolutely not worth repairing, I think it will be better for you to comply with the sanitary authorities' requirements. Without seeing a copy of the agreement entered into between yourself and the urban council, I am not in a position to advise you as to its effect.

W. JOHNSON-ROBERTS.

Levelling with Theodolite.

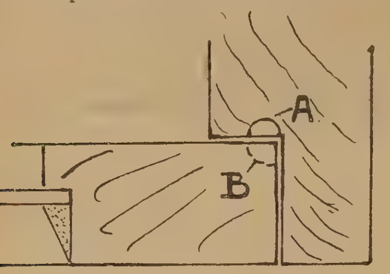
LOWESTOFT.—S. A. C. writes: "(1) Can I set a plain 6in. theodolite so that it can be used in exactly the same way as a dumpy level, reading the rise and fall on the staff, and can levelling be done as accurately? (2) Are iridium points with stadia reading used in plain theodolites; if not, could they be fitted? (3) Could a small survey of a farm be made as well with a dumpy level and compass fitted under it as with a theodolite? (4) Which is the most practical book on surveying and levelling with a description of the instruments used?"

(1) By clamping the vertical arc at zero, a theodolite may be used in precisely the same way as a dumpy level. (2) Iridium points are supplied with most modern instruments, but if they are lacking they can always be fitted. My own instrument has been fitted for stadia reading in this way, but the lines are permanently drawn on a glass diaphragm instead of iridium points. (3) A compass is far too inaccurate to be in the least relied upon. Besides the difficulty of reading it accurately, the needle is continually being affected by external influences such as iron railings, &c. (4) I should like to recommend my own book, "Surveying and Surveying Instruments" (Whittaker & Co.),

but fear the first edition is out of print, while the second will not be ready for a few weeks yet. G. A. T. M.

Making Casements Water-tight.

HANDSWORTH.—HANDS writes: "Some casement windows let in driving rain very badly. I presume this would not have happened had a groove been put in the frame at A on sketch. On account of expense I do not want to take out the frames. Would it remedy matters if the inner edge of the casements were cut away as marked at B?"



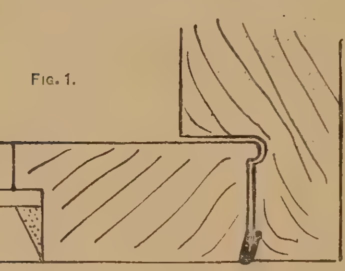


FIG. 1.

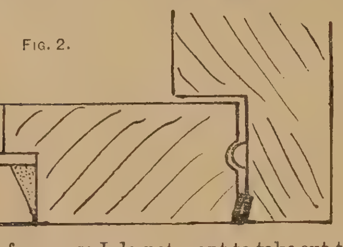


FIG. 2.

A hollow at B would be useless. The correct form of joint is shown in Fig 1. As you do not wish to take out the frames and alter them, we advise you to put a bead on the frame and make a corresponding groove in the casement as in Fig. 2, which should be fairly water-tight.

Building Trade Catalogues.

MOBBERLEY.—FOREMAN BRICKY writes: "Why are advertisers who are manufacturers of goods used in the building trade so chary in sending their catalogues to anyone who has not a printed trade card or memorandum form?"

The catalogues of many firms who supply the building trade are costly to produce, and it is only to be expected that they do not wish to waste them on persons who are not likely to become customers; hence the reticence you refer to, though for our own part we have always found that the firms are very generous in sending out copies of their catalogues to all and sundry. It should also be remembered that, besides the cost of the catalogue itself, there is the postage on it; and business houses are not philanthropic institutions.

Books on Sewage Matters.

LONDON.—E. E. B. writes: "Kindly recommend a work dealing with the different methods of sewage-disposal now in use, and their respective merits; the law relating to the responsibilities of the various local authorities; and also the limits of their power: for instance, I am told that they have no legal power to compel the owner to put in surface-water drains under roadways. Also a book giving practical formulæ or tables for determining the size of the proposed sewers for new roads, correct distances apart for storm gulleys, and road drainage generally."

The most recent and comprehensive work dealing with the various subjects mentioned is "Specification No. 5" (published at these offices, price 5s.). The following works, treating of the different phases of sewage-disposal, &c., are also recommended:—Santo Crimp's "Sewage-disposal Works" (Griffin & Co., 30s.), illustrating methods of land purification of sewage; Rideal's "Sewage and the Bacterial Purification of Sewage" (Ingram, 14s.) for biological systems of purification; and Poore's "Dwelling-House" (Longmans, Green & Co., 6s. 6d.) for details of the dry-earth system for country houses, &c. The legal duties and responsibilities of local authorities and the statutory limitation of their powers are described in "Knight's Annotated Bye-laws," (Knight & Co., 12s. 6d.) and in Stevenson & Murphy's third volume of "Hygiene and Public Health," which deals with sanitary law (Churchill, 28s.). Another useful little brochure is Ravenhill's "Elements of Sanitary Law" (Sanitary Publishing Co., 6d. nett). Practical formulæ for the determination of the size of sewers, together with details of sewer construction, road drainage, &c., will be found in Savage's "Sewerage and Sewage-disposal of a Small Town" (Biggs & Co., 5s.); also in Moore's "Sanitary Engineering" (Batsford, 30s.). With regard to the provision of separate surface-water drains to new buildings, it was decided last year in the Court of Appeal (*Matthews* v. *Strachan*) that in considering what is "necessary for the effectual drainage" of a new house under section 25 of the Public Health Act of 1875 the local authority cannot take into consideration what is desirable for the sewage-disposal of the district generally, so that the local authority cannot therefore insist upon separate drains for sewage and surface-water. We are, however, unable to find any authoritative decision that it is contrary to the provisions of the Public Health Act to require separate surface-water drains or sewers to new streets if considered necessary.

T. E. C.

Varnishing on Outside Doors.

LEICESTER.—R. G. writes: "(1) The outside woodwork of my house was painted and finished with a coat of varnish, in the summer. After a driving rain, it has a milky appearance which disappears in time. What it the cause of this? (2) Kindly name a good book on measuring timber, deals and hardwood (logs squared and round and uneven), with tables, and the customs adopted in the timber trade."

(1) A coat of varnish although good, often gets a "bloom" upon it from bad application. Damp wood on which it is applied is one of the most frequent causes, and it is also caused by damp before the varnish is dry. The peculiar effect rain has in the case you instance, we cannot explain, assuming your account to be correct, but we should think the varnish was not good. (2) W. Richardson's "Practical Timber Merchant," price 3s. 2d. post free, from Mr. B. T. Batsford, 94 High Holborn, W.C.

Thickness of Plastering.

TODMORDEN.—STUDENT writes: "(1) What should be the thickness of three coats of plaster on lath-and-half laths? (2) What quantity of sand should be used with 100 tons of stone lime for three-coat plasterwork on laths?"

Lath-and-half laths are about $\frac{1}{4}$in. thick. The first coat should not be less than $\frac{3}{8}$in. and not more than $\frac{5}{8}$in.; the most suitable thickness is $\frac{1}{2}$in. The second or floating coat should be not more than $\frac{5}{8}$in. or less than $\frac{3}{8}$in. thick. The setting coat should not exceed $\frac{3}{16}$in. or be less than $\frac{1}{16}$in; $\frac{1}{8}$in. is best. The three coats should not be less than $\frac{3}{4}$in., and with the laths should occupy 1in. (2) 100 tons of stone lime should be used to every 400yds. of sand and 600 bushels of hair (this latter must not be omitted).

Compensation from a Trade-Union.

R. G. writes: "A member of a trade society resigns, and thus becoming a 'non-unionist' the union men refuse to work with him, so that he must either leave or be discharged. Can he claim compensation from the Society for loss sustained whilst out of work?"

We do not know of any similar case having been decided at law; but if there were no remedy it would be contrary to every principle of right. Such an action by a trade-union is practically a case of boycott, and the offence is criminal. It has been decided in the case of *Taff Vale Railway Co.* v. *Amalgamated Society of Railway Servants* that a labour union can sue and be sued in respect of wrongs committed by or against it. If, therefore, it could be proved that a workman had suffered loss by the action of a trade union, compensation could undoubtedly be obtained.

Pope's Villa and Walpole's Villa.

SOUTHPORT.—F. H. C. writes: "I am much obliged to Mr. Burgess for his information about Horace Walpole's villa. A short time ago I rode on the top of a 'bus from Richmond to Hampton Court. Pope's villa, at Twickenham, I understand to be a comparatively modern house erected on the site of the house in which Pope lodged. Is this so? Further on we passed a plaster castellated building which it struck me might very well answer to Horace Walpole's villa. This was at Strawberry Hill. I had a distinct recollection, however, of having read that Walpole's villa had ceased to exist. Is this so, or is this house really Walpole's building?"

The "castellated" building which "F. H. C." passed on his ride from Richmond to Hampton Court is the house which Horace Walpole built and lived in. He is also correct about Pope's villa, which is on the same route. The house which Pope bought (with money obtained from the sales of the first portions of his translation of the Iliad) consisted of a small body with a small hall, paved with stone, and two small parlours on each side; the upper storey being disposed on the same plan. This house was contained by the river on one side, and the road—Cross Deep—on the other. He also purchased an extensive garden on the opposite side of the road, and he connected the house with the garden by means of a tunnel under the road. This tunnel was embellished with many devices to make it appear a grotto. A plan of the grotto and gardens, and a catalogue of the ores, spars and gems which enriched it, with the names of those persons who had been benefactors to it, was published in a brochure by J. Serle, Pope's gardener, in 1745, a year after Pope's death. The cost of constructing the grotto and laying out the gardens is given as £6,000. Dr. Johnson remarked: "A grotto is not often the wish or pleasure of an Englishman, who has more frequent need to solicit than exclude the sun; but Pope's excavation was requisite as an entrance to his garden; and as some men try to be proud of their defects, he extracted an ornament from inconvenience, and vanity produced a grotto where necessity enforced a passage." After being in the possession of several worthy people, the house was bought in 1807 by Baroness Howe, who preserved the grotto, but entirely demolished the house, and erected at a little distance a commodious family residence; this was at a later period divided into two houses. The present house, "neither like Pope's house nor any other," was built by Mr. Thomas Young (not, however, on the site of Pope's). It has been described as follows: "It is a combination of an Elizabethan half-timber house and a Stuart Renaissance, with additions of Dutch, Swiss, Italian and Chinese features, probably designed when its architect was fresh from a diligent study of the paintings in Lord Kingsborough's work on Mexican antiquities." This house is at present occupied by Mr. H. Labouchere.

As regards Walpole's villa, Walpole purchased the place in 1747, when it was but a "little plaything house." The "Castle," as he called it, was formed by alterations and additions to the old small house. The library and refectory were built in 1753; the gallery, round tower, great cloister and cabinet in 1760; the great north bedchamber in 1770; and the Beauclerk tower with hexagon closet in 1776. Lord Macaulay says: "Every apartment is a museum, every piece of furniture is a curiosity; there is something strange in the form of the shovel, there is a long story belonging to the bell-rope." Walpole's aim in designing it was the revival of Gothic domestic architecture. It is constructed in a kind of concrete. Its general effect would be more pleasing at a distance. Although he persevered with his intention, Walpole does not seem to have been altogether satisfied with the result, for he makes many apologies for it, the best of which was that it is "a fantastic fabric." A full account of the buildings, with plans, elevations, details and interior perspectives, as well as a catalogue of the numerous and valuable art treasures it contained during his lifetime, may be read in the second volume of his works.

ALFRED BURGESS.

Bricks and Mortar.

APHORISM FOR THE WEEK.

The majority of men prefer the worst architect and the most slap-dash way of dealing with the work, and would give anything to be rid of the restraint which a conscientious architect imposes upon their wishes.—SIR GILBERT SCOTT.

Our Plates. THE Roehampton Club for Working Girls, Cornwall Road, S.E., is situated in a very poor and thickly-populated part of Lambeth. It was built and opened for its work in 1900, and the accommodation provided comprises a large reading- and games-room on the ground floor and lavatories in the rear. On the first floor are two class-rooms and a small kitchen or cooking room for the use of the girls, and on the second floor a kitchen and two bedrooms are provided for the caretaker. The external walling is built in stock brickwork, with red-brick relieving arches over the windows, &c. The roof is covered with grey slates. All the external woodwork is painted white. The whole of the work was well executed by Messrs. Garratt & Son, builders, of Old Town, Clapham, S.W., from the designs of Mr. W. G. Horseman, architect, of 67, St. George's Road, S.W., and the cost, exclusive of the site, was just under £1,000. The site being very much out of square, was not easy to deal with, but the rooms as finished do not show this internally to any extent. The funds available precluded any elaboration.

The Alterations at Windsor Castle. MESSRS. WARING are carrying out the alterations at Windsor, which are now sufficiently near completion to allow a description of them to be given. In the private royal apartments, where the importance of the work centres, a brilliant effect has been obtained by employing large surfaces of cream-white as a background for the works of art. In the king's bedroom the colour predominating is an Irish green. The King's sitting-room is the one in which the late Prince Consort passed his last hours, and the whole of the interesting features which identify the room with Prince Albert have been preserved. The ceiling has been slightly reduced in height; an eighteenth-century raised moulding in flowers and fruits of a simple form occupies the centre, with a console cornice. The whole is left a perfectly plain white. Below is a deep frieze or band of soft-coloured green. The room has a high wooden dado, with bevelled panels and pilasters, forming an excellent background for the favourite family portraits which adorn the room. Her Majesty's bedroom is panelled in a soft rose silk, and the windows are hung with a pure white soft satin, which hangs in ample folds and gives the necessary cool effect. The whole of the furniture is of the Empire period in design. The bathroom adjoining is panelled with marble on one side and Sheraton woodwork on the other. The marble employed both in the King's and Queen's bathrooms is of Greek origin, from the quarries which have been reopened within the last year after having been lost sight of for over 1,000 years. For the royal boudoir old Louis XVI. furniture has been rummaged out from another part of the Castle and covered in a soft-coloured Beauvais tapestry, and the carpet manufactured in France at the State factories is remarkably tender in colour, taking up the mother-of-pearl tints of old rose, green, blue, cream, &c. The broad old-fashioned gilt moulding round the panels has been retained and the centre filled in with beautiful silks. The old satin-wood doors have been replaced by Spanish mahogany with bronze ornaments. In addition to the decorations considerable improvements, amounting to reconstruction, have been made in the sanitary arrangements of the southern part of Windsor Castle by the officials of his Majesty's Office of Works, under the advice and supervision of Professor Corfield, their consulting sanitary adviser. The whole of the drains under the south towers, from Edward III.'s Tower to the Victoria Tower inclusive, have been done away with, so that there is now no drain under the buildings on that side of the Castle, and new water-tight iron drains have been laid outside the buildings. Similar improvements will gradually be carried out throughout the rest of the Castle.

Builders' Notes.

"The Quarry" Collection of Building Stones was inspected on December 14th last by the Battersea Polytechnic Architectural Society, when Mr. J. V. Elsden, B.Sc. (London), F.G.S., delivered a lecture on them. This lecture has now been reprinted in pamphlet form by "The Colliery Guardian" Co., Ltd., 49, Essex St., Strand, W.C.

The Aberdeen Master-Slaters' Association held its first annual meeting last week, when the following office-bearers were appointed:—President, Mr. James Wright, 5, Belgrave Terrace; vice-president, Mr. James Wilson, 79, Spring Garden; treasurer, Mr. Robert Stuart, jun., 35, Holland Street; committee, Messrs. Merson, Kincaid, Farquhar and Martin; secretary, Mr. P. W. L. Clark, solicitor, 259, Union Street. Auditors, Messrs. A. Kincaid and Macdonald.

Fire Tests with Warehouse Floors.—The British Fire Prevention Committee have arranged for a very important test to take place to-day with a large warehouse floor constructed entirely of Karri and Jarrah wood, the floor being constructed on the same principle as recently adapted for the big warehouse in the new Free Port at Hamburg. There will also be tests with Karri and Jarrah doors for comparison with the fire-resistance of oak and teak doors.

Partnership Dissolved. — The partnership between Messrs. Samuel James Chambers and George Chambers, carrying on business as builders and contractors at Dorset Road and Weymouth Avenue, South Ealing, and at the Grove, Ealing, under the style or firm of Chambers Brothers, has been dissolved by mutual consent as and from November 5th last. All debts due to and owing by the late firm will be received and paid by Mr. Samuel James Chambers.

The Executive of the British Fire Prevention Committee announce that the silver medal which they offered for the best essay on fire-resisting materials exhibited at the International Fire Exhibition of 1901, at Berlin, has been awarded to Lieutenant Elener, of Berlin, the assessors being Chief Officer Giersberg, of Berlin, and Mr. Edwin O. Sachs, chairman of the Committee. The essay will be published in the official Government report of the Exhibition in the German language, and also in the Committee's publications in an English translation.

City and Guilds of London Institute: Department of Technology.—With the view of allowing candidates for the honours grade examination in painters' and decorators' work a longer period in which to execute the practical tests for that examination, the Institute has decided, as notified in the report on the work of the Department, to issue particulars of such tests to all centres at which classes in the subject are held, by Saturday, February 8th, instead of by March 1st, as stated in the programme. The candidates' prepared work must be forwarded to the Institute on or before Saturday, March 22nd. External candidates who wish to present themselves for the examination should apply for particulars to the Superintendent, Department of Technology, City and Guilds of London Institute, Exhibition Road, London, S.W.

The Mason Trade in South Africa.—A correspondent, who has been about thirty years at Cape Town, writes: "When the war is finished there will be hundreds of masons among the refugees and colonials already in the country who will only be too glad to avail themselves of the opportunity to work on the projected railways. As regards hewing, there is nothing in the whole country at present; there is any amount of material, and all kinds of the best stone; but it requires the railways extended throughout the country, and that will take several years; then stone and slate will be easily and cheaply conveyed to growing townships. As regards masonwork on the railways, it is far different from the style of work at home; there is no such thing as skewed arches, or neatly scabled ring-heads; it is mostly all from the spauling hammer (Cornish style), and then the stone is nearly all granite or bastard stone that they use on railway works. Still I believe there is a great future for the building trade out there, but the country will have to get over the effects of the long war before the mason trade will be brisk (I mean for hewers)."

The Aberdeen Master-Painters' Association held its annual meeting last week, when office-bearers were elected as follows:—President, Mr. Alexander Latto; vice-president, Mr. William Philip; secretary and treasurer, Mr. J. B. Davidson, of Reid & Davidson, advocates; committee, Messrs. Henry Donald, John Mason, Edward Copland, Adam Buchan, C. R. Fraser and J. W. Forrest.

London County Council.—At last week's meeting of the Council Mr. Davies, chairman of the Improvements Committee, informed Mr. Emden that the question of widening Piccadilly from the Circus westward was under the consideration of his committee, and it entirely depended upon the sympathy that would be shown by freeholders and leaseholders affected as to whether a report would be presented or not.—A resolution was passed referring to the Highways Committee to consider and report on the best means for the Council to obtain such statutory powers as to insist on inadequate notice being given before opening roads or streets, and also for the Council to superintend and expedite such work.—A motion was adopted referring to the Highways Committee the question of some "over and under" provisions, by means of bridges or subways, to cope with cross-traffic in streets.

Surveying and Sanitary Notes.

Competition for Laying-out Estate.—Plans recently submitted in open competition by Mr. Ernest E. Ellis, architect, Exmouth, for laying-out a building estate near London, have been judged the best. The estate is a very large one, and contains about 1,500 acres.

"Insanitary Angles."—Mr. Mark H. Judge, A.R.I.B.A., has addressed a letter to the mayor, aldermen and councillors of Hampstead (in pamphlet form) in reference to the drains of 70, Canfield Gardens, Hampstead, objected to by the borough sanitary inspector (as reported in our issue for December 11th, 1901).

Epping Forest Improvements.—In 1897 suggestions were made to the Corporation of London by the local authorities that a large ornamental pond should be constructed in the Forest between Whipps Cross Road, Leyton, and the Snaresbrook Road, on a swampy and uneven portion of the Forest, known as the Hollow Pond, and the Corporation provided £650 towards the cost. The work was immediately put in hand, and completed at an expense of £1,228. The Corporation now consider that a great improvement would be effected if the area of the pond were extended by the addition of about three acres at a cost of about £1,800.

A Criticism of the Designs for Birmingham University.—In the course of his presidential address to the Midland Arts Club last week Councillor J. W. Tonks contended that the true art of architecture consisted in the right and balanced application of right lines, sloping lines and curves. In modern buildings they saw nothing but a series of vertical lines, and he held it to be barbarous and contrary to the best traditions. In this connection he severely criticised the designs for the proposed Birmingham University buildings (by Messrs. Aston Webb and E. Ingress Bell). He described them as a series of blocks or square towers at intervals like gate-legged tables set on end, with a flattened dish-cover in the centre of each to serve as a dome. As one stood opposite them he would see nothing but a monotony of barbarous vertical lines, and the flattened domes would only seem to weigh like a nightmare on the soul. The style was called Spanish, but he thought it was Saracenic. The Trocadero in Paris was built on somewhat similar lines, but there the towers were not at the corners. The two mighty towers approaching the centre gave picturesqueness to the whole, and the building was thrown into a noble curve, but it was a failure, and so would the University be if built on the proposed plans.

RECENT DATA CONCERNING CONCRETE BEAMS AND CONCRETE FLOORS.*

BY JAMES BRUCE.

CONCRETE, whether used for foundations, walls or floors, is of great and increasing interest to us as architects. As an Association it has come under our consideration many times, both in lectures and in visits to works in progress, and in the future it will be still more forcibly brought before us. Those who live into the middle of this century will see its use still more widely extended, and it becomes us to prepare for this increasing application by studying its resources and experimenting upon its properties. We are, as a body, so conservative and reluctant to adopt either new methods or new materials that any attempt to extend our knowledge in either direction will rightly be subjected to rigid scrutiny. Not that concrete is in itself a new material—for is not the dome of the Pantheon partly constructed of concrete?—but its use for beams and floors is comparatively recent. Entire buildings, including domes and bridges, are now constructed in armoured concrete. We have in this city a large warehouse at present in course of erection on the Hennebique system of ferro-concrete, to which this Association paid a recent visit. Engineers, at any rate, are not afraid of it; and that leads me to say that if we do not make ourselves well acquainted with concrete as a building material, the designing of such structures will naturally pass to the engineer, and he will not be slow to take advantage of it.

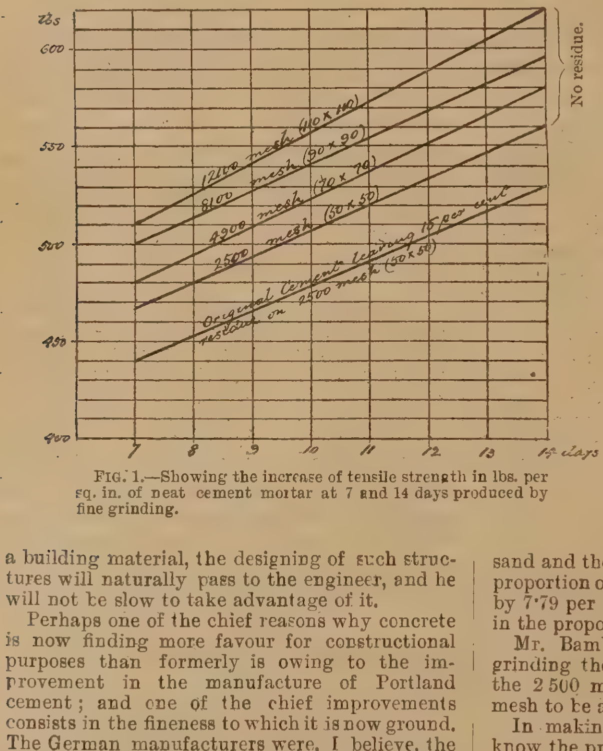


FIG. 1.—Showing the increase of tensile strength in lbs. per sq. in. of neat cement mortar at 7 and 14 days produced by fine grinding.

Perhaps one of the chief reasons why concrete is now finding more favour for constructional purposes than formerly is owing to the improvement in the manufacture of Portland cement; and one of the chief improvements consists in the fineness to which it is now ground. The German manufacturers were, I believe, the first to produce that extreme fineness of grinding which is now considered to be the best test of Portland cement. In Germany to-day cement can be obtained which leaves less than 10 per cent. residue on a sieve of 32,200 meshes to the square inch.

Of two cements of the same age and from the same maker the finer-ground variety will invariably be found to be the stronger. This is shown in Fig. 1, where the original cement as it came from the bag was tested and found to leave a residue of 15 per cent. on 2,500 mesh (50 by 50). It was tested for tensile strain at seven and fourteen days, after being kept six and thirteen days in water respectively, and the strain was applied at the rate of 100lbs. every fifteen seconds. The results given are the mean of six briquettes in each case. A quantity of the same cement was then taken and ground over again so that it now all passed the 2,500 mesh. It was then tested, and showed an increase of strength. The same cement was ground still finer so that it all passed the 4,900 mesh and tested, and so on to the 8,100 mesh and the 12,100 mesh, each test showing an increased strength. (This and the following diagrams are taken from tables given by Mr. H. K. C. Bamber in a paper read before the Incorporated Association of Municipal and County Engineers at the annual general meeting held at West Bromwich on July 14th, 1893.)

But the increase in the strength of finely-ground cement is better seen in Fig. 2, which gives the results of tests made with briquettes mixed in the proportion of 3 of standard sand (all to pass a 20 by 20 mesh and be retained by a 30 by 30 mesh) to 1 of cement. After each experiment the cement was ground to a finer quality, as in Fig 1, and then subjected to the next higher test. As before, the original cement left 15 per cent. on the 2,500 mesh, and when mixed in the proportion of 3 of sand to 1 of cement broke with 154lbs. per sq. in. at twenty-eight days (twenty-seven in water). The cement was ultimately ground to all pass a 12,100 mesh and then tested. It was found that it broke with a tensile strain of 294lbs. per sq. in., which is nearly double (90·9 per cent.) the original strength (154lbs.).

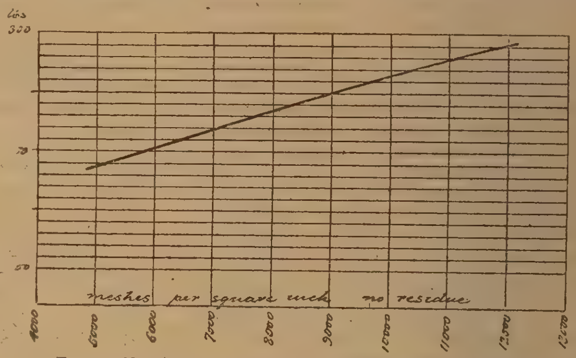


FIG. 2.—Showing the increase of tensile strength in lbs. per sq. in. at 28 days of cement mortar (1 cement and 3 sand) produced by fine grinding.

Mr. Bamber has also made another series of tests in which he gradually reduced the proportion of cement to sand as the cement was ground finer until he at last reached the proportion of 3 of sand to ½ of cement, which gave a tensile strain of 166lbs., the cement having all passed the 12,100 mesh. The original cement, as before, gave 15 per cent. residue on the 2,500 mesh and broke with 154lbs., and was mixed in the proportion of 3 of sand to 1 of cement; so it is evident that by using the same sand and the former fine-ground cement in the proportion of 3 to ½ a stronger mortar is obtained by 7·79 per cent. than by using mortar mixed in the proportion of 3 to 1 of ordinary cement.

Mr. Bamber states that the extra cost of grinding the ordinary cement (15 per cent. on the 2 500 mesh) until it all passes the 12,100 mesh to be about 6s. per ton.

In making concrete it is very important to know the proportions of voids in the aggregate. This can easily be found by experiment. The best concrete is made by selecting the most suitable aggregate and filling all the voids with a matrix as strong as the aggregate itself. Each separate piece of aggregate must be surrounded by the matrix to form a mortar joint at least ⅛in. thick. In this way, after being gently punned, solid concrete will be formed. To find the correct amount of mortar to fill all the voids and surround each stone or pebble with such a joint, it is necessary to add 10 per cent. of the bulk of the aggregate to the voids already found by experiment: because in measuring the voids in any given aggregate the separate pieces are all touching, and the thing to aim at in making concrete is not to have any of the separate pieces of aggregate touching but to form a mortar joint around each piece; hence the necessity of adding 10 per cent.

Many experiments have been made to find the proportions of voids in different kinds of aggregate, and I would here like to direct your attention to those made by Mr. J. Watt Sandeman, M.I.C.E., of Newcastle, who has given a great deal of study to this subject. He found that the voids in broken stone of various sizes ranged from 34 per cent. to 50 9 per cent. of their bulk, and in gravel consisting of small pebbles up to those which would pass a 2½in. ring the percentage was 33·6. I recently made two experiments myself to find out the amount of voids in brick aggregate broken to pass a 3in. ring, and found that one result gave 51 and the other 52 per cent.

When the aggregate is broken to various sizes, large and small, the proportion of voids is less than when broken to a uniform size, because the little pieces tend to fill up the spaces between the larger ones.

That concrete is often made with an insufficiency of mortar to fill all the voids is a fact which has come under my own observation. When it is used for foundations, such cavities or air-spaces (if they are small) do not perhaps detract to any appreciable extent from its strength, because the concrete is almost entirely in compression; but when the same material is used for beams or flooring slabs any cavities or air-spaces occurring must reduce its transverse strength very considerably, and if situated in the lower half of the beam or slab they are simply fatal to its strength.

To fill the voids in the aggregate, the mortar must be mixed with the proper amount of water. If less than the proper amount is used the mortar occupies more bulk than it would otherwise do, and in setting it leaves cavities. That such cavities do sometimes exist in slabs used for flagging purposes the following case mentioned by Mr. Bamber will show. He was consulted as to the reason why certain concrete flags after rain always remained wet and seemed to absorb water very easily, while their neighbours made from the same cement soon became dry. By experiment he found that enough concrete composed of 1 cement, 2 sand and 4 shingle could be made to fill a box 18in. cube by using 40lbs. of water. Again, by using only 15lbs. of water, the other proportions being the same, he could only get seven-eighths of the bulk of the resulting concrete into the same box. Hence, he concluded that of flags of the same size made in the above proportions the one mixed with the least water contained cavities amounting to one-third of its bulk, and he thought the explanation of the wet and dry flags was that the rain soaked those having air-spaces which filled with moisture and only evaporated very slowly. It appears paradoxical to say that the flags remained wet because they were made too dry, but such appears to be the case.

Coming now to some actual experimental data concerning concrete slabs, it is proposed to compare those tested at London in March, 1896, by Messrs. Fowler & Baker with those at Gallowgate in September, 1899. The latter were carried out jointly by a committee of this Association together with representatives from the local master-builders' association and the Council of the Building Trades' Exchange. The age of the slabs at the time of testing was in both cases nearly the same, the London ones being sixty-three days old and the Gallowgate ones sixty-one; while the cement used in the latter case was rather finer ground and weighed less than that used in the London slabs.

To begin with the Gallowgate slabs. These were made without expanded metal in the proportion of 1 cement, 1 sand and 4 clean-washed gravel, to pass a 2in. gauge. They were of different spans, but were all 8in. thick and 4ft. wide. The gravel must have contained voids to the amount of one-third of its volume.

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* A paper read before the Northern Architectural Association at Newcastle on January 15th, 1902.

One volume of cement and 1 of sand would, on being made into mortar, only occupy ·76 per cent. of its former volume—that is, $2 \times \frac{76}{100} = 1{\cdot}52$ volumes of finished mortar. (This data is taken from the experiments by Mr. Sandeman before referred to.)

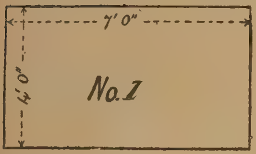
To make solid concrete, the mortar should fill all the voids plus 10 per cent. of the volume of the aggregate. The amount of gravel whose voids the 1·52 volumes of mortar will fill in this way can be found thus:—

Let A represent the volume of gravel required. The voids in A are $\frac{A}{3}$, to which must be added 10 per cent. of A, or $\frac{A}{10}$. These two expressions must equal the amount of mortar as above.

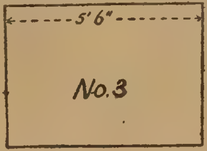
$$\therefore \frac{A}{3} + \frac{A}{10} = 1{\cdot}52.$$

$$\frac{13A}{30} = 1{\cdot}52.$$

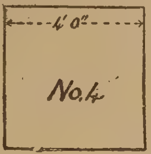
$$A = 3{\cdot}5 \text{ volumes of gravel.}$$



Superimposed weight	-	9
Weight of slab	-	23
Total breaking weight	-	32 cwts.



Superimposed weight	-	22·66
Weight of slab	-	18·07
Total breaking weight	-	40·73 cwts.



Superimposed weight	-	124·678
Weight of slab	-	13·142
Total breaking weight		137·82 cwts.

Therefore the proportions of 1 cement, 1 sand and 4 gravel will not make solid concrete. The gravel in certain places will be quite bare of mortar, and when subjected to transverse strain will be weak. To make solid concrete we may either reduce the amount of gravel to $3\frac{1}{2}$ parts or increase the mortar to 2·28 parts. The proportions will then be 1 cement, 1 sand and $3\frac{1}{2}$ gravel, or $1\frac{1}{7}$ cement, $1\frac{1}{7}$ sand and 4 gravel; the former proportion is preferable.

Coming now to the actual tests at Gallowgate. Three slabs of concrete in the proportion of 1 cement, 1 sand and 4 gravel, sixty-one days old, were loaded with an equally distributed weight until they broke. They were each 4ft. wide and 8in. thick, and of the above clear spans.

As the slabs had to carry their own weight in addition to that imposed on them, it is necessary to find the weight of each slab and add it to the superimposed weight. The total thus obtained is the breaking weight of each. It would have simplified matters if a few of the slabs had been weighed before testing, and an average weight per cub. ft. thus obtained. As this was not done, the weight of the slabs will have to be found from the given data thus:—

"The stability of a loaded beam is founded on the equality that must always exist between the resultants of all the external forces tending to cause its rupture and the sum of the molecular forces which resist the same." Practically these may be resolved into $M = R$, where M denotes the external forces and R the internal molecular forces; or, in other words, M stands for the bending moment and R for the moment of resistance. The bending moment for a beam with a distributed load supported at the ends is $\frac{WL}{8}$ where W is the weight and L the span. The moment of resistance for a rectangular beam is $\frac{CBD^2}{6}$, where C is a constant depending on the nature of the material, B the breadth and D the depth.

As stated, the bending moment is equal to the moment of resistance,

$$\therefore \frac{WL}{8} = \frac{CBD^2}{6}.$$

To apply this expression to the two slabs No. 1 and No. 3, let x denote the weight of No. 1 in cwts. and y of No. 3; L, the length of No. 1, is 7ft. and $5\frac{1}{2}$ft. for No. 3. The superimposed weights are 9 cwts. and 22·66 cwts. respectively. Substituting these values, the foregoing expression now becomes

$$\text{For No. 1 slab, } \frac{7(9 + x)}{8} = \frac{CBD^2}{6}.$$

$$\text{For No. 3 slab, } \frac{5{\cdot}5(22{\cdot}66 + y)}{8} = \frac{CBD^2}{6}.$$

$$\therefore 7(9 + x) = 5{\cdot}5(22{\cdot}66 + y).$$

$$63 + 7x = 124{\cdot}63 + 5{\cdot}5y$$

$$7x = 61{\cdot}63 + 5{\cdot}5y \quad \ldots \ldots (1).$$

We also know that the weight of No. 1 slab is to the weight of No. 3 slab as the span of No. 1 is to the span of No. 3. Therefore, we have this proportion:—

$$\frac{x}{y} = \frac{7}{5{\cdot}5}$$

and

$$y = \frac{5{\cdot}5x}{7}.$$

Substituting this value of y in (1), we get

$$7x = 61{\cdot}63 + \frac{30{\cdot}25x}{7}.$$

$$49x = 431{\cdot}41 + 30{\cdot}25x,$$

$$18{\cdot}75x = 431{\cdot}41.$$

$x = 23$ cwts. = the weight of No. 1 slab, from which we find the weight of a cub. ft. of the concrete to be 138lbs. The weight of all the other slabs can now be found.

To compare the transverse strength of the various slabs it is only necessary to find the value of C in the original expression

$$\frac{WL}{8} = \frac{CBD^2}{6}.$$

Taking slab No. 1 and substituting the proper values in the above, we get

$$\frac{32 \times 84}{8} = \frac{C \times 48 \times 8 \times 8}{6}$$

$$C = \frac{21}{32} = 0{\cdot}656 \text{cwts. per sq. in. for No. 1 slab.}$$

$$C = 0{\cdot}656 \text{ cwts. per sq. in. for No. 3 slab.}$$

(L, B, and D are taken in inches and W in cwts.)

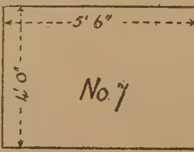
The weight of No. 4 slab is 13·142 cwts., and the superimposed weight is 124·678 cwts.; therefore, the total weight which broke the slab is 137·82 cwts., and the value of C is found as above thus:—

$$\frac{137{\cdot}82 \times 48}{8} = \frac{C \times 48 \times 8 \times 8}{6}$$

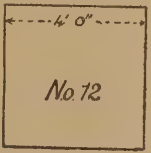
$$\frac{413{\cdot}46}{256} = C$$

$$1{\cdot}615 \text{ cwts. per sq. in.} = C \text{ for No. 4 slab.}$$

The next two slabs, No. 7 and No. 12, were both composed of 1 cement, 1 sand and 2 gravel, to pass an inch gauge. They were each $4\frac{1}{2}$in. thick and 4ft. wide, and of the following clear spans:—



Superimposed weight	-	17·47
Weight of slab		10·16
Total breaking weight	-	27·63 cwts.



Superimposed weight	-	10·83
Weight of slab		7·39
Total breaking weight	-	18·22 cwts.

$$\text{For No. 7 slab, } \frac{27{\cdot}63 \times 66}{8} = \frac{C \times 48 \times 4\frac{1}{2} \times 4\frac{1}{2}}{6}$$

$$C = 1{\cdot}407 \text{ cwts. per sq. in. for No. 7 slab;}$$

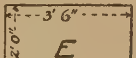
$$\text{and for No. 12 slab, } \frac{18{\cdot}22 \times 48}{8} = \frac{C \times 48 \times 4\frac{1}{2} \times 4\frac{1}{2}}{6}$$

$$C = 0{\cdot}675 \text{ cwts. per sq. in. for No. 12 slab.}$$

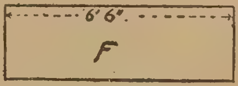
No. 12, as the result shows, is abnormally weak, and should be discarded. If we compare it with No. 7, which is of the same proportions and broke with 27·63 cwts., we find that No. 12 only carries about one-half what we should expect.

As this completes all I have to say about the Gallowgate slabs, it will be convenient here to make a few remarks about the method of loading them. In using pigs of iron for the weight there is a slight tendency for them to form an arch, and thus the total weight of the pigs would not be the actual distributed load. A better way, in my opinion, would have been to have used bricks laid without any bond, the joints all being straight and perpendicular. There could not be any possibility of an arch being formed if that method had been used.

Turning now to the experiments made in London in 1896 by Messrs. Fowler & Baker, we find that the slabs were composed of 1 cement, 1 sand and 2 of Thames ballast, and were tested at the age of sixty-three days. They were each 2ft. wide and 3in. thick and of the following clear spans:—



Superimposed weight	-	18
Weight of slab		2·156
Total breaking weight	-	20·156 cwts.



Superimposed weight	-	6
Weight of slab	-	4
Total breaking weight	-	10 cwts.

The total breaking weights were 20·156 cwts. for E and 10 cwts. for F. The weights of the slabs have been taken at 138lbs. per cub. ft., as before.

Using the same formula as for the Gallowgate slabs, and substituting the proper values of the symbols, we have for E—

$$\frac{WL}{8} = \frac{CBD^2}{6}$$

$$\frac{20{\cdot}156 \times 42}{8} = \frac{C \times 24 \times 3 \times 3}{6}.$$

$$C = 2{\cdot}939 \text{ cwts. per sq. in. for E;}$$

and for F—

$$\frac{10 \times 78}{8} = \frac{C \times 24 \times 3 \times 3}{6}.$$

$$C = 2{\cdot}708 \text{ cwts. per sq. in. for F.}$$

These values for C agree pretty closely, and are about double those obtained for the Gallowgate slabs of similar proportions.

No experiments appear to have been recorded of concrete flooring slabs built in on all four sides, but a few have been published of those *supported* on four sides. Col. Seddon made some in 1874 at Chatham. In his experiments, which are given in the appendix to his volume on "Builders' Work," the slab nearly square is selected for comparison with those discussed above. It was composed of 1 part Portland cement to 4 crushed brick, to pass an inch mesh, and measured 14ft. 6in. by 13ft. 6in. between the supports. It was 6in. thick and weighed 121lbs. to the cub. ft., was well beaten down, and covered with water for seven days. After twenty-one days it was tested and broke with $10\frac{1}{2}$ tons distributed weight on the slab, or, including its own weight, 15·68 tons; that is 1·613 cwts. per sq. ft.

To compare this with the Gallowgate and London slabs, we apply this formula: for an oblong slab supported at its four edges the greatest bending moment is $\frac{WL^4B}{8(L^4+B^4)}$. This expression must be equated to the moment of resistance of the section along its length, which is $\frac{CLd^2}{6}$ $\therefore \frac{WL^4B}{8(L^4+B^4)} = \frac{CLd^2}{6}$. The distributed weight W is 315·7 cwts., including the weight of the floor; L, the length, and B, the breadth, both in feet; d, the depth in inches; C, as before.

$$\therefore C = \frac{3WL^3B}{4d^2(L^4 + B^4)}.$$

$$C = \frac{3 \times 315{\cdot}7 \times 14{\cdot}5^3 \times 13{\cdot}5}{4 \times 36(14{\cdot}5^4 + 13{\cdot}5^4)} = 3{\cdot}49 \text{ cwts. per sq. in.}$$

The strength of a slab uniformly loaded and fixed at the ends is at least $1\frac{1}{2}$ times that of one supported only, and the strength of a square slab fixed all round appears only to be $1\frac{1}{4}$ times that of one supported all round. But how much the strength of a rectangular slab is increased by fixing its edges all round over that of a similar one supported only at the four sides no definitite information has come under my notice.

More experiments are needed; and it is hoped that, with the increase of engineering laboratories at so many of the technical schools and colleges, we will not have to wait long for some such tests being undertaken. In the meantime, if we use the value of C derived from Col. Seddon's experiments of slabs supported on four sides, and apply a factor of safety of 5, we will be well within the limits of safety. As an example of this, let us take an actual warehouse floor which has stood for a number of years. Its dimensions are 21ft. by 12ft. 6in. by 13in. thick. Applying the formula for a rectangular slab supported at the four sides,

$$\frac{WL^4B}{8\,(L^4+B^4)}=\frac{CLd^2}{6}\ \therefore\ W=\frac{4Cd^2\,(L^4+B^4)}{3L^3B}$$

Substituting the value of C just obtained from Col. Seddon's slabs and the proper numerical values in the last formula, we get

$$W=\frac{4\times3{\cdot}49\times169\,(21^4+12{\cdot}5^4)}{3\times21^3\times12{\cdot}5}=1{,}487\text{ cwts.}$$

$W = 1{,}487$ cwts. total distributed breaking weight.

As the weight of the floor itself is about 306 cwts., it leaves 1,181 cwts. for the breaking weight on the floor; and with a factor of safety of 5 it will be seen that the floor will carry nearly 1 cwt. per ft. super. at the early date of three weeks. Col. Seddon's slab was only *supported* at its four edges, but this one was built in and the centering was allowed to stand for six weeks. At the end of that period it had, no doubt, an ample factor of safety.

Concrete is weak in resisting tensile stress; and the future of concrete flooring lies in its being reinforced with iron or steel, either by expanded metal at the under-surface or by means of steel rods, as in the Hennebique system.

Keystones.

A New Technical Institute at Dartford has been opened at a cost of £8,000.

A Monument to the Notable Surgeon Hollier, by Boucher, the sculptor, is about to be erected at Lyons.

The Jubilee Memorial of Queen Victoria at Buenos Ayres, provided by the loyalty of the British Colony, is a home for sailors, towards which £6,000 was raised as soon as the proposal was made, and for which the Argentine Parliament, by a unanimous vote, gave a valuable site on the new docks. This memorial building is now approaching completion.

A New Post-Office at Enfield is to be erected at the junction of Little Park and Church Street. The present offices are a part of the fine old Tudor building known as the Royal Palace. The south wing, with its tall brick chimneys, still remains, and within there are richly ornamented ceilings, oak-panelled walls, and a massive chimney-piece on Ionic and Corinthian columns, and here are seen the letters "E. R." (Edward VI.), with the arms of England and France quartered.

The Third Block of the New Admiralty Buildings has been commenced, and Messrs. Chessum & Son, of Bow, are now engaged upon the foundations. The architects of this third erection are Messrs. Leeming & Leeming, who have carried out the other two blocks. The new pile will, of course, correspond with the edifice overlooking St. James's Park, the characteristics of which were largely dominated by the original old Admiralty building to which it was an addition. The new structure on the Horse Guards' side of the quadrangle will probably constitute the most important frontage of the modern Admiralty. While, of course, the general style of it will be that of the two other portions, it will be somewhat more imposing and elaborate. A fourth addition is now in contemplation, and the probability is that before the Horse Guards' frontage has got far on its way a new building will be decided on to face Whitehall, and running down from the Park to the Paymaster's Office, thus effectually extinguishing Ripley's pillars and pediment which the screen on the street-frontage line was erected in some measure to mask.

A Monument to Victor Hugo, by M. Juste Becquet, is to be erected at Besançon, the natal town of the poet.

The Yarmouth Old Town Wall.—The Town Council have decided finally by 19 votes to 12 to demolish the Rampart Road Town Wall, notwithstanding three memorials from the Norwich Archæological Society, the secretary of the Society for the Protection of Ancient Buildings, and the inhabitants of the borough, urging its preservation.

The Ardrossan Co-operative Society has accepted the plans for new buildings sent in by Mr. Allan Gilfillan, Ardrossan. A two-storey block is to be erected with 300ft. frontage to Woodwynd and 37ft. frontage to Main Street, Ardrossan. The buildings will probably cost about £6,000. Architects were invited to send in competitive plans, and those sent in by Mr. Gilfillan were very favourably reported on by the assessor.

The First National Bank in Chicago is about to erect one of the largest office buildings in the United States at a cost of over £1,000,000. It will be sixteen storeys high, and will have a ground area double that of any other Chicago building. The Montauk building, a towering structure of twelve storeys, built a few years ago at a cost of £100,000, will be pulled down with other buildings to make way for the new Colossus.

A New Cold Storage Building in Newcastle is being erected for the Northern Counties Ice and Cold Storage Company, at the Quayside. The factory will contain about 250,000 cub. ft. for cold storage, and also an ice plant to make nearly 200 tons of clear ice per week. Messrs. Cackett & Burns Dick are the architects for the building, and the machinery and general arrangement of the factory is in the hands of Mr. Cott, of London, and Mr. Baxter, the Company's engineer.

A New Asylum at Winwick, near Warrington, was opened recently. Messrs. Neill & Sons, of Manchester, were the contractors, and the asylum has cost £253,000. It is built on the pavilion system, with a large administrative block in the centre and wards on each side connected by corridors. Accommodation is provided for 1,000 females and 1,000 males, and also 200 attendants. The cost, exclusive of furniture, totals up to £382,955, and the amount will be at least £400,000 when completed.

A Figure of Lord Roberts on a Reredos.—The new reredos which has been designed for the Church of St. Agnes, Bristol, as a memorial to the boys of Clifton College who have fallen in the war in South Africa, contains the figure of Lord Roberts. It is believed to be the first time a public man has been represented on such a piece of work, and it shows the Commander-in-Chief kneeling as if in the act of prayer. Behind him stand Dr. Browne, the Bishop of Bristol, and the figures of a nurse and a footballer.

New Board Schools at Cressing have been erected on the Braintree road, and are divided into three sections—infants, girls and boys; altogether there is accommodation for 200 children, and the school can be thrown all into one and made to hold a meeting of 300 people. Outside, the building is of red bricks and inside the walls, which are 14in. thick, have been coloured and have a dado of brown glazed brickwork. The builder was Mr. Frank Johnson, of Chelmsford; and the architects are Messrs. Clare & Ross, of Chelmsford. The contract price for the school, with extras, was £2,105, and with the other connected expenses the total cost will be £2,500.

The Withington Cemetery Buildings Competition.—The Withington Council have adopted the plans of Mr. Ernest Woodhouse, of 88, Mosley Street, Manchester. The competition was a local one, limited to the architects of Manchester and district. Thirteen or fourteen sets were submitted. Mr. Woodhouse submitted two sets, and it is noteworthy that he was successful in securing the first and second premiums. Mr. R. Knill Freeman was the assessor, and he placed the first four in the following order:—No. 1 (Experience) and No. 2 (Economy), Mr. Ernest Woodhouse; No. 3 (Spes), Messrs. Alfred H. Mills and Roger Oldham, 33, Brazennose Street, Manchester; No. 4 (Chapelle), Messrs. James B. Bowler and L. H. Dutch, 5, Cross Street, Manchester. The first three in his opinion were entitled to the premiums awarded, in the order placed above.

A Bridge on the River Brain at Braintree collapsed last Saturday while a steam-roller was passing over it.

Leighton House.—The Kensington Borough Council has declined to proceed further with the negotiations for the transfer of Leighton House.

To St. Wendron Church, near Helston, some additions have recently been made, including richly-carved stalls, detached desks and seats for the officiating clergy, a lectern and altar-rails.

New Buildings for Glasgow Parish Council are being erected in George Street from designs by Messrs. Thomson & Sandilands, architects. The following are the principal contractors:—Mason and joiner, Messrs. William Shaw & Son; slater, Messrs Hamilton & Co.; plumber, Mr. Robert S. Renfrew; plasterer, Messrs. Stevenson & Leitch.

"Old Mortality" was the name by which Mr. John Owen, of Stockport (who died recently), was known to his friends; for, like Scott's famous character, he revelled in gravestones, parish registers and all kindred records of human lives. The Lancashire and Cheshire Antiquarian Society elected him an honorary member in appreciation of his many services to local archæology.

Culham Training College, Oxford, is being extended by the addition of a new building, to be used chiefly for science. The new block, which is detached, occupies a site at the north-east corner of the main building. The building is of massive stonework, in Gothic style. Mr. J. G. T. West, M.S.A., of Abingdon, is the architect, and Mr. James Buckle, of Abingdon, the builder.

St. James's Church, Hereford, was destroyed by fire seven weeks ago and is to be rebuilt at a cost of about £4,000. The architects, Messrs. Nicholson & Hartree, propose, amongst other improvements, that there should be a thicker ashlar lining of the walls. They also propose to add a west door, the means of exit being at present insufficient; to enlarge the vestry, substitute oak for pitch-pine in the seating and roof timbers, and block floors instead of boards, raise the walls, and install a hot-water or steam heating apparatus.

Grecian Excavations.—Dr. Murray, in his second lecture at the Royal Institution last Thursday on excavations at Delphi and in the Greek islands, dealt with statues that had been discovered. Lantern slides were shown of a bronze charioteer, a marble statue of Agras, and a lion hunt of Alexander the Great which were found at Delphi; the statues recently recovered from the sea at Cerigo; and a bronze statue found at Pompeii. The French, said Dr. Murray, had accomplished one of the greatest tasks at Delphi, which was only to be compared with that of the Germans at Olympia, which must rank as the most productive.

Norman Arches in Chatham Church.—A meeting was held at Chatham recently to consider what course should be adopted with reference to the Norman arches recently discovered in pulling down a portion of the parish church for the purpose of rebuilding the old Georgian nave. A resolution was moved in favour of enlarging the scope of the restoration scheme so as to preserve the relics of the original Norman church; and it was stated that it would entail an additional expenditure of £1,000. The motion was carried unanimously. It was stated that contracts had been signed for the final section of the restoration scheme at a cost of £6,000.

Wakefield Philistines.—At a recent meeting of the West Riding County Council a discussion took place on the subject of the proposed widening of Kirkgate Bridge, at Wakefield. Three schemes have been under consideration, and it is feared that some interference with, if not the removal of, the ancient chantry will be inevitable. The chantry dates from the fourteenth century. The chairman (Mr. Milnes Gaskell) said the people of Wakefield did not seem to care much for anything unless it had a money value. He reminded members that there was formerly an ancient market-cross of much interest in the city. It had been carted away, and there was no proposal to restore it to a place where it would be an ornament to Wakefield.

St. Peter's Church, Fairfield, Buxton, is being enlarged at a cost of about £3,000 from designs by Messrs. Garlock & Flint, architects, of Buxton. Messrs. Alfred Hill & Brother, of Buxton, are the builders.

The Competition for the Hearts of Oak Benefit Society's New Offices has been awarded as follows: 1st premium, Messrs. Essex, Nicol & Goodman, 21, Waterloo Street, Birmingham; 2nd, Messrs. Meaby & Webbe, Jessel Chambers, Chancery Lane, W.C.; 3rd, Messrs. Lanchester, Stewart & Rickards, 1, Vernon Place, Bloomsbury Square, W.C.

Protest against Terms of Competition.—The Cardiff, South Wales and Monmouthshire Architects' Society have protested against the terms offered in a competition for a new chapel in Cathedral Road, Cardiff, which they consider inadequate. They express the hope that no member of their Society will take part in it, or in any other competition offering similar terms.

A Bronze Statue of Queen Victoria at Lahore, representing her Majesty seated on a throne in full regal state, erected by public subscription in commemoration of the Diamond Jubilee, was unveiled recently. The sculptor is Mr. Bertram Mackerrall. The Punjab Memorial Fund is to be devoted to placing a marble canopy over the statue, and has reached a total of £3,867.

The Society of Architects held a meeting last Thursday, when Mr. M. Sullivan read a paper on "Early British and Celtic Art," dealing entirely with its archæological and literary side. The secretary, Mr. Butler, announced the decease of Mr. J. A. Burton, of Ashton-under-Lyne, one of the first members of the Society; and Mr. E. C. Beaumont, of 78, Fleet Street, E.C., was elected a member.

Mr. Walter George Penty, architect, head of the well-known firm of Penty & Penty, of York, died last Thursday. He practised in the city for many years, and among the public buildings designed by him are the Free Library and the new Liberal Club. Mr. Penty was a Fellow of the Royal Institute of British Architects, and on more than one occasion occupied the position of president of the York Architectural Society. A "Men who Build" article dealing with his work appeared in our issue for November 7th, 1900.

The Selected Plans for the New Bluecoat Hospital at Liverpool, to be erected on a site at Wavertree, have been returned by the Charity Commissioners as being too costly (the amount works out at £280 per head), and it seems that a wholesale curtailment will be necessary; moreover, the old site in School Lane is scheduled in the Liverpool and Manchester Mono-Rail Act, and the Trustees may find themselves in the position of being asked for vacant possession of the old site before the new school is ready for occupation.

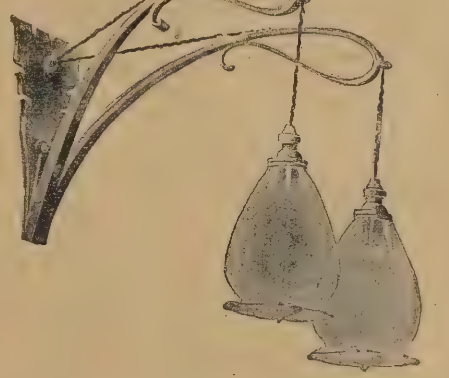
The Wolverhampton and District Architectural Association recently held its first annual meeting at the Law Library Rooms, Wolverhampton. The president, Mr. J. Lavender, occupied the chair. The officers for the ensuing year were elected as follows:—President, J. Lavender, F.R.I.B.A.; vice-president, G. H. Stanger, F.R.I.B.A.; hon. secretary, W. Edwards; hon. treasurer, J. Harrison Woller; auditor, W. J. Oliver, M.S.A.; ordinary members of Council, F. Hunter Lynes, A.R.I.B.A., T. H. Fleeming and S. H. Eachus, M.J.S. (London). The meeting concluded with an address from the president.

Northampton County School Competition.—The Governors of the Northampton and County Modern and Technical School have accepted plans for the extension of the school by the addition of chemical laboratories, lecture-rooms, boot and shoe shop, &c., and also for the erection of a master's house and boarding house on Billing Road, Northampton. A competition was recently held, and it was stipulated that the cost of the Billing Road buildings was not to exceed £4,000, and a similar amount for the extension and alteration of the present school. Mr. J. A. Gotch, of Kettering, was the assessor, and acting upon his recommendations the Governors, we understand, have accepted the plans prepared by Mr. Herbert Norman, of Market Square, Northampton, working in conjunction with Mr. McKewan, of Birmingham. A premium of twenty-five guineas has also been awarded to Mr. E. Danford, of Northampton, whose plans were regarded as the next best. There were about thirty entries.

Trade and Craft.

Electric-Light Fittings.

By this time we may expect that electric-light fittings shall be designed with that freedom which their use affords. Gas jets almost invariably demand a vertical termination, and other considerations (such as heat) restrict the designer to a large extent. But with electric light, which enables the lamps to be fixed in any position, such scope is possible that the design is ineffectual if it is nothing more than an adaptation of familiar gas-fittings; and, moreover, it exhibits a loss of opportunity which is much to be deprecated. Their conditions therefore being entirely without precedent, electric-light fittings should be uninfluenced by those for any other light. Many such fittings as these, designed with care and executed in a workmanlike manner, can be seen at the showrooms of the General Electric Co., Ltd., in Queen Victoria Street, E.C. Whilst being essentially modern, they do not exhibit the eccentric quaintness of some of our home manufacturers, nor the wild extravagance of Continental work; and in price they range from simple and artistic brackets at 4s. to articles costing £20 or £30 apiece. Although the Company's works are situated in Birmingham, the production of these designs is superintended by their designer, with the result that nothing whatever is lost by the separation of the head-office from the works. Some are finished in polished brass or copper, others in natural bronze, oxidised silver, and hammered iron (either black or finished in armoured steel). These finishes are sometimes combined with brass or copper, bright or dull, just as design or taste requires. The accompanying illustration shows a specimen of the work done by this company, who have various branches in different parts of the country—Glasgow, Newcastle, Manchester, Birmingham, Cardiff and Dublin. Their new Fittings Catalogue contains innumerable varieties, but the Company has a large staff of artists who are always engaged in submitting designs to suit particular requirements for public buildings, private houses, public contract work, &c. Amongst their contracts for street-lighting we may mention Rathmines, Pembroke, Queenstown, Hornsey, Fulham, Battersea, &c., and in this connection it is opportune to refer to their fitting for incandescent street-lighting when gas is replaced by electricity. The hood and reflector of the lantern have the incandescent lamps securely attached to it, and are so hinged that the whole of the upper part of the fitting can be swung back to facilitate cleaning and changing the lamps. The Company is at present engaged in supplying several large installations of this fitting, which has met with very generous approval among borough electrical engineers.



Window Glass.

In towns and cities, where the sky is made murky by smoke and buildings are high and closely huddled together, the difficulty of obtaining adequately-lighted rooms is very considerable, and tends to increase rather than to diminish. Various devices have been employed for making the most use of the light there is, and prominent among them is the patent prismatic rolled glass manufactured by Messrs. Pilkington Brothers, Ltd., of St. Helens—a glass which has been extensively employed with most satisfactory results. With ordinary glass the rays of light, falling almost vertically, are concentrated on the small space immediately inside the window, whereas by means of prismatic rolled glass they are diverted horizontally into the room and illuminate the whole of it. Its advantages in this respect are obvious; but, in addition, it is easily fixed, and is less liable to be broken than ordinary glass. Messrs. Pilkington also manufacture a wired rolled glass which has been proved to be an effective fire-stop, as well as a protection against burglary; which qualities have found for it a rapidly-increasing sale.

COMING EVENTS.

Wednesday, January 29.

Clergy and Artists' Association.—Annual General Meeting at 113 Cromwell Road, at 3.30 p.m.

Northern Architectural Association.—Council Meeting at 6.45 p.m. Mr. R. P. S. Twizell, A.R.I.B.A., on "The Development of Architectural Ornament," 7.30 p.m.

British Archæological Association.—Meeting at 8 p.m.

Thursday, January 30.

London Institution.—Mr. G. J. Burch., F.R.S., on "Colour Vision," 6 p.m.

Royal Institution.—Dr. A. S. Murray on "Recent Excavations at Delphi and in the Greek Islands,"—III., 3 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. H. Thorp, F.R.I.B.A., on "An Old Quarter of Paris," 5.30 p.m.

Friday, January 31.

Architectural Association.—Mr. C. Harrison Townsend, F.R.I.B.A., on "Originality in Architectural Design," 7.30 p.m.

Royal Institution.—Prof. A. Crum Brown on "The Ions of Electrolysis," 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Messrs. J. C. Collett and W. H. C. Clay on "The Quay-Walls of Keysham Harbour," 8 p.m.

Saturday, February 1.

Sanitary Inspectors' Association.—Sir James Crichton Browne presides at the Annual Dinner at Holborn Restaurant, 6.30 p.m.

British Institute of Certified Carpenters.—Meeting at Carpenters' Hall at 6 p.m.; Council 3 p.m.

Edinburgh Architectural Association.—Visit to Archers' Hall and Craigmillar Park United Free Church.

Architectural Association.—First Spring Visit to Christ Church, Brixton Road (near Kennington Park), by permission of Prof. Beresford Pite, at 2.30 p.m.

Monday, February 3.

Royal Institute of British Architects.—Address to Students by Mr. John Slater, B.A. Criticism of Designs and Drawings by Mr. H. T. Hare. Presentation of Prizes. Election of Members. 8 p.m.

Liverpool Architectural Society.—Mr. Robert Pepys Cockerell on "The Life and Works of Prof. Charles Robert Cockerell, R.A.," 6 p.m.

Society of Arts (Cantor Lectures).—Mr. Samuel Rideal, D.Sc., on "The Chemical Purification of Water," 8 p.m.

London Institution.—Mr. C. H. Reilly, M.A., on "City Buildings, Old and New," 5 p.m.

Birmingham and District Clerks of Works' and Builders' Foremen's Association.—Mr. Albert S. Smith on "Ancient versus Modern Building," 8 p.m.

Society of Engineers.—Inaugural Address by Mr. Percy Griffith, 7.30.

Tuesday, February 4.

Cardiff, South Wales and Monmouthshire Architects' Society (Associates' Section).—Lecture by Mr. Edwin Seward, F.R.I.B.A., 8 p.m.

Society of Arts (Applied Art Section).—The Rev. Herbert Thurston, S.J., on "The History of the Rosary in all Countries," 4.30 p.m.

Institution of Civil Engineers.—Discussion on papers on "Sewerage Systems of Sydney, N.S.W.," and "The Bacterial Treatment of Trades Waste," 8 p.m.

Architectural Association of Ireland.—Mr. F. G. Hicks on "Colour in Architecture," 7.45 p.m.

Wednesday, February 5.

Society of Arts.—Mr. Herbert T. Thomas on "Jamaica," 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Northern Architectural Association.—Mr. Nigel Bond, B.A., on "The Work of the National Trust for Places of Historic Interest," 7.30 p.m.

Royal Philosophical Society of Glasgow: Architectural Section.—Mr. Ebenezer Howard on "Garden Cities," 8 p.m.

Chemical Society.—Meeting at 5.30 p.m.

Geological Society of London.—Meeting at 8 p.m.

Ruskin Society of Birmingham.—Mr. Arthur Sidgwick, M.A., on "Cowper," 7.45 p.m.

The Sheffield Society of Architects' Prize for the best set of measured drawings of buildings within the Society's district has been awarded to Mr. G. Rider Morris.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BATH.—For the erection of a school for 360 boys on the Oak Street site, for the Bath School Board. Mr. William John Willcox, architect, 1 Belmont, Bath :—

C. Wibley, James Street	£7,834
Chancellor & Son, Green Park Villa	7,618
Erwood & Morris, Railway Place	7,510
W. Webb, Railway Place	7,427
L. Hayward & Wooster, Walcot Street	7,425
Wills & Sons, Grove Street	7,412
Long & Sons,* Railway Road	6,591

* Accepted.

BRECON.—For the carrying out of works of sewerage and sewage disposal for the villages of Senny Bridge and Defynock, including stoneware pipe sewers, manholes, lampholes, ventilators, flushing wells, sewage lift, septic tank installation, filtration areas, and other works, for the Brecknock Rural District Council. Mr. B. L. Pritchard, surveyor, 8 Castle Street, Brecon :—

J. Monks, Newport	£3,484 19 7
Johnson, Bros., Hereford	3,379 19 10
J. Lawson & Co., Newport	2,977 13 6
Baines, Chaplin & Co., Roath, Cardiff	2,824 7 2
J. Sutherland, Abercynon	2,609 19 4
W. Moses,* Senny Bridge	2,300 0 0
F. Martin, Senny Bridge	1,699 2 8

* Accepted.

BRIDGEND.—For the erection of new premises on the corner of Wyndham and Adare Streets, Bridgend, for Messrs. Griffiths and Singer. Mr. P. J. Thomas, architect, Bridgend :—

Lloyd & Tape, Barry	£3,518 0
W. McGaul, Quarella, Bridgend	3,300 0
W. Francis, Bridgend	3,040 0
R. Jones, Coychurch, Bridgend	3,015 10
C. H. Cookseley, Miskin, Pontyclun	2,930 0
P. Gaylard,* Bridgend	2,750 0

* Accepted.

BROADSTAIRS.—For alterations and additions to Bleak House, for Mr. Thomas Barry. Mr. William A. Burr, M.S.A., architect, 76 Chancery Lane, W.C. :—

	Victoria Stone.	Terra Cotta.
Denne	£3,978	—
Whiteley, Ltd.	3,850	£3,796
May	3,816	3,816
Stevens Bros.	3,770	3,780
Martin	3,640	3,625
Brown	3,500	3,412
Paramor	3,485	—
Gann & Co. (Whitstable)	2,945*	2,910

* Accepted.

BUCKHURST HILL (ESSEX).—For the construction of bacteria beds, sewage filters, storm overflow sewers, &c., at the Buckhurst Hill Sewage Works, for the Buckhurst Hill Urban District Council. Mr. H. Tooley, A.R.I.B.A., surveyor, Buckhurst Hill :—

J. & T. Binns, Croydon	£2,021
W. Coker, Rochester	1,898
G. Bell, Tottenham	1,823
C. Ford, Harlesden	1,740
F. J. Coxhead, Leytonstone	1,560
G F. Tomlinson, Derby	1,450
Wilkinson Bros., Finsbury Park	1,400
W. & C. French,* Buckhurst Hill	1,390
W. Manders, Leyton	1,312

* Accepted.

CARDIFF.—For works in Bute Street, for the Corporation of Cardiff. Mr. W. Harpur, borough engineer :—

J. E. Evans	£2,667 8 6
J. Allan & Son	1,822 11 10
F. Ashley	1,695 2 6
C. Davies	1,635 3 9
F. J. Robbins*	1,535 2 2

* Accepted. [All of Cardiff.]

CARDIFF.—For the erection of car depôt in Newport Road, Roath, Cardiff, for the Corporation. Mr. W. Harpur, borough engineer :—

E. Turner & Sons	£27,032	W. Symonds & Co.	£23,996
J. Allan & Sons	25,867	W. T. Morgan	23,126
E. R. Evans & Bros.	24,478	Lattey & Co.	22,867
D. Thomas & Son	24,342	D. W. Davies*	21,968

* Accepted. [All of Cardiff.]

CLERKENWELL.—For taking down and rebuilding back front wall of No. 13 Sans Walk, for Mrs. Moore. Mr. William A. Burr, M.S.A., architect, 76 Chancery Lane, W.C. :—

Kirby	£110 0
Reason	85 0
Stevens Bros.	59 10
Hocking*	54 16

* Accepted.

CROYDON.—For alterations to premises, 145 and 147 North End, Croydon ("Croydon Guardian" Offices), first portion. Mr. Frank Windsor, architect, 9 and 10 Bank Buildings, George Street, Croydon :—

Huntley	£145 0 0
Hubbard	135 0 0
Card*	132 10 0
Shirley	122 12 6

* Accepted.

CWMCELYN (near BLAINA, MON.).—For the erection of an infants' school, to accommodate 200 children, at Cwmcelyn, near Blaina, with out-offices, boundaries, and playground, for the Aberystruth School Board. Mr. R. L. Roberts, architect, Abercarn :—

D. W. Richards, Marlborough Road, Newport	£2,990 0
D. Lewis, Llanhilleth	2,800 0
W. Phillips, Castle Street, Abertillery	2,756 0
A. P. Williams, Gwenlland House, Abertillery	2,695 0
T. Westicott Crindau, Newport	2,692 10
D. J. Davis, Harrow Road, Newport	2,679 0
D. Powell, Abertillery	2,625 10
J. Jenkins, King Street, Brynmawr	2,527 0
J. Lloyd, Dyke Street, Merthyr	2,454 10
M. Jenkins, 32 Vivian Road, Newport	2,448 18
J. Newcombe,* Victoria Road, Ebbw Vale	2,400 0

* Accepted.

ERDINGTON (BIRMINGHAM).—For the erection of new pavilions, boiler-house, and other works at the Workhouse, Erdington, for the Guardians of Aston Union. Messrs. C. Whitwell & Son, architects, 23 Temple Row, Birmingham :—

S. Surman & Son	£18,106
W. & J. Webb	17,719
J. Barnsley & Sons	16,666
R. M. Hughes	16,489
B. Whitehouse & Sons	16,475
W. Lee & Son	16,446
S. Giles & Son	16,266
W. Robinson	16,190
A. C. Hughes	15,985
W. H. Gibbs, King's Heath	15,725
T. Johnson,* Great Brook Street	15,700

* Accepted. [Rest of Birmingham.]

ERITH (KENT).—For the construction of the following works, for the Erith Urban District Council, viz. : (Section L) engine and boiler-house; (Section M) chimney shaft; (Section N) sanitary work, water, and fire services; (Section O) rain and surface water drains; (Section P) approach roads at site :—

Sections L and P.

A. N. Coles, Valletort Building Yard, Stonehouse, Plymouth	£6,955 7 9
Courtney & Fairbairn, 377 Albany Road, Camberwell, S.E.	6,290 0 0
G. H. Gumming & Sons, Elmdene, The Avenue, Erith	6,100 0 0
Thomas & Edge, Anglesea Avenue, Woolwich	5,800 0 0
Holliday & Greenwood, Ltd., Loughborough Park Works, London, S.E.	5,798 0 0
F. G. Minter, Ferry Works, Page Street, Westminster, S.W.	5,453 0 0
Wilkinson Bros., 155 St. Thomas's Road, Finsbury Park, N.	5,435 3 3
J. Smith & Sons, Ltd., Junction Works, South Norwood, S.E.	5,293 0 0
B. E. Nightingale,* Albert Embankment, London, S.E.	5,200 0 0

Section M.

F. & E. Davey, Albert Works, Queen's Road, Southend-on-Sea	1,147 0 0
Universal Engineering Co., Colling Street, Nottingham	696 0 0
Wilson, Bros. & Lamplough, 31 Berens Road, Kensal Rise, W.	639 0 0
D. Lee, Pocklington, York	535 0 0

Section N.

Beaver & Sons, Westgate Street, Gloucester	357 9 6

Sections N and O.

Davis & Bennett, Westminster Sanitary Works, 3 Princes Street, S.W.	844 10 0
G. Jennings, Ltd., 66 Lambeth Palace Road, London	667 3 9

* Accepted.

GLASGOW.—For carpenter, joiner, and ironmonger and slater's work required in the erection and completion of eastern district hospital proposed to be erected in Duke Street, for the Glasgow Parish Council. Mr. John Baxter, I.M., surveyor, 243 St. Vincent Street, Glasgow :—

Carpenter, Joiner, and Ironmonger.

A. Ferguson, 281 Bath Street	£10,504 0 0
Anderson & Henderson, Ltd., Kinning Park Sawmills, Kinning Park	9,816 17 0
G. & D. Newton, Whitelaw Street, Maryhill	9,591 0 6
D. Buchanan, 399 London Road	9,410 6 6
Allan & Baxter, 198 Maxwell Road	9,281 15 8
Miller & Murray, 187 Pollokshaws Road	9,107 6 10
W. Lightbody, 42 Sydney Street	9,073 10 2
W. McCall & Son, 5 Balmano Street	8,759 0 0
H. McTaggart, 6 Mill Street, Bridgeton	8,708 0 0
P. Gaffney, 53 Abercromby Street	8,626 2 5
J. Russell & Sons,* 71 Cumberwauld Road	8,427 0 0

Slater.

J. McQuat & Son, 98 London Street	1,263 0 0
W. & D. Mailer, 12 Houldsworth Street	1,205 0 0
A. Robertson, 31 Argyle Street	1,183 6 10
Hamilton & Co., 10 Margaret Street	1,170 0 0
J. Cuthbertson & Son, 267 Shields Road	1,153 16 3
White & Co.,* 9 Chatham Place	1,103 16 0

* Accepted. [Rest of Glasgow.]

HASLINGDEN.—Accepted for the erection of proposed technical school and free library (subject to the approval of the Local Government Board), for the Corporation. Mr. J. S. Green, borough surveyor :—

T. Collinge, mason	£3,987 0
T. Tattersall, carpenter and joiner	1,145 0
J. R. Hargreaves, plumber and glazier	840 0
J. Bradley & Son, heating	317 10
J. J. Nuttall, plasterer and painter	222 2
H. H. Tomlinson, slater	111 0
J. Waddington & Co., ventilating	96 1

[Borough surveyor's estimate, £6,831.]
Total with electric lighting estimate, £6,768 13s.

HOLBORN.—For alterations, additions, and repairs to 304 High Holborn, for Messrs. Godwin & Son. Mr. William A. Burr, M.S.A., architect, 76 Chancery Lane, W.C. :—

	For alterations.	For repairs.
Langham	£410	£81
Larke & Son	344	64
Hocking*	275	51

* Accepted.

HOLMFIRTH (YORKS).—For No. 1 section of the sewage scheme, for the Holmfirth Urban District Council. Messrs. Joshua Barrowclough, Holmfirth, and Beesley, Son, & Nichols, joint engineers, Westminster :—

J. Brunton, Hull	£25,078 6 10
Jones Bros., Barnsley	24,497 15 0
Johnson Bros., Hereford	24,463 19 0
J. Bentley, Bradford	21,981 0 0
A. Braithwaite & Co., Leeds	21,234 10 0
W. Brigg, Bradford	20,500 0 0
Pedrette, Clapton	19,657 0 0
C. Cooke & Co., London	19,500 0 0
Underwood Bros., Dukinfield	18,938 0 0
H. Tyson, Halifax	18,452 0 0
A. Graham & Sons, Huddersfield	18,400 0 0
C. E. Carden, Stafford	18,310 16 3
T. Egan & Sons, Bradford	18,093 17 7
C. Butterworth, Newton, Carlisle	17,840 0 0
W. Waring & Sons, Huddersfield	16,614 5 9
R. Turner,* Holmfirth	16,499 19 9

* Accepted.

ILFRACOMBE.—For constructing a tunnel about half a mile in length in the parish of Bratton Fleming, in the county of Devon, in connection with their new water undertaking, for the Ilfracombe Urban District Council :—

Underwood & Bro., Dukinfield and Exmouth	£7,349 0 0
J. Ford, Coalville, near Leicester	6,260 0 0
J. Burgess, Combmartin, N. Devon	5,052 10 0
D. Jenkins, Dinas Powis, near Cardiff	4,636 0 0
R. & J. Hooper, St. Austell, Cornwall	4,500 0 0
Low & Thomas, Dinsey, Cheshire	4,085 0 4
Case Sea Defence Syndicate, Holborn, London	3,855 12 8
E. R. Lester, Plymouth	3,700 0 0
J. Riley, Cheltenham	3,192 0 0
Somerville, Combmartin, N. Devon	3,072 0 0
W. Parkin, Rockhaven, Combmartin	2,975 0 0
Murdock & Co., Camborne, Cornwall	2,283 0 0
J. Dickson,* St. Albans and Dunsford, near Exeter	1,672 0 0

W. Barrick, Higher Broughton, Manchester, per schedule of prices.

* Accepted.

LONDON, S.E.—For foundations for new cold stores, Green Bank and Morgan's Lane, Tooley Street, S.E., for the London Cold Storage, Ltd. Mr. W. H. Wateiman, architect, 7 Cullum Street, E.C. :—

J. B. Squire & Co.	£16,278 0 0
J. T. Firbank	14,452 3 10
J. Mowlem & Co.	14,063 0 0
N. Fortescue & Sons	13,293 0 0

MALMESBURY (WILTS).—For the erection of technical and secondary schools, for the Malmesbury and District Technical Educational Committee. Mr. Robert E. Brinkworth, F.S.I., architect, St. Mary's Street, Chippenham, Wilts :—

Mr. F. Hughes, Malmesbury	£4,415 0
Messrs. Downing & Rudman, Chippenham	3,907 0
Messrs. Smith & Light, Chippenham	3,833 0
Mr. A. J. Colborne, Swindon	3,776 11
Mr. William Beazley,* Calne	3,220 0

* Accepted. [Architect's estimate, £3,700.]

NORTH RONALDSHAY (ORKNEY).—For the construction of a pier at North Ronaldshay, for the North Isles Committee of the Orkney County Council :—

J. Adam & Co., Glasgow	£3,761 6 6
S. Firth,* Harray, Orkney	2,209 0 0

* Accepted.

REDHILL (SURREY).—For the erection of St. Joseph's Catholic Presbytery and Schools, Redhill. Mr. William Bevan, architect, 12 Buckingham Street, Strand, W.C. Quantities by the architect :—

J. P. Groome	£3,685 0
Longley & Co.	2,779 0
Bagaley & Sons	2,570 0
Smith & Sons	2,479 0
G. Minter	2,460 0
J. Appleby	2,420 0
W. Wallis	2,385 0
R. B. Amos	2,379 7
J. Nicks	2,350 0
Buckland & Waters	2,340 0
Harris & Son	2,330 0
J. & M. Patrick	2,269 0
Battley, Son & Holness	2,197 0
H. Heathfield	2,175 0
A. B. Apted	2,143 0
Nightingale & Son	2,109 0
Cronk and Richardson	2,073 0
Roberts & Co.	2,055 0
Davis & Leaney*	1,998 0
E. Worsell (withdrawn)	1,776 0
G. Martin (withdrawn	1,726 0

* Accepted.

SOUTHALL (MIDDLESEX).—For supplying and laying about 6,600 ft. lineal of stoneware pipe surface-water sewers, varying from 9 in. to 18 in. in diameter, with manholes, &c., for the Southall-Norwood Urban District Council. Mr. Reginald Brown, A.M.I.C.E., engineer and surveyor :—

Felkin & Watson, Southall	£4,340 0 0
Macklin, Hanwell	4,336 0 0
Wimpey, Hammersmith	4,145 3 5
H. Morecroft, Acton	3,989 0 0
Porter, Hackney	3,353 15 1
Bell, Tottenham	3,103 16 3
Rayner, Croydon	2,813 19 9
A. & B. Hanson, Southall	2,754 12 5
E. Plaistowe,* Southall	2,645 19 3

* Accepted.

SUTTON (SURREY).—For the erection of new public baths (Throwley Road), for the Sutton (Surrey) Urban District Council. Mr. C. Chambers Smith, C.E., surveyor :—

W. Wallis	£7,591	W. Smith & Sons	£6,879
J. Longley & Co.	7,589	J. B. Potter	6,858
C. Ansell	7,474	Sabey & Son	6,689
J. Christie	7,270	Courtney & Fairbairn	6,629
Cropley Bros.	7,100	Duncan, Stewart & Son	6,588
R. Jones & Son	7,038	Viney & Stone	6,563
Maple & Co.	6,949	Martin, Wells & Co.*	6,299
Turtle & Appleton	6,938		

* Accepted.

CURRENT MARKET PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	—		
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	12	6
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	7	0	1	8	7
Colza Oil, English	do.	1	7	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	9	6	—		
Lead, white, ground, carbonate	do.	1	4	10	—		
Do. red	do	1	0	4½	—		
Linseed Oil, barrels	do	1	9	3	1	9	6
Petroleum, American	per gal.	0	0	6⅞	0	0	7
Do. Russian	do.	0	0	5⅝	0	0	6⅜
Pitch	per barrel	0	7	0	—		
Shellac, orange	per cwt.	6	2	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	12	6	1	13	0
Tar, Stockholm	per barrel	1	3	0	1	3	6
Turpentine	per cwt.	1	10	0	—		

METALS

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	66	0	0	—		
Iron, Staffs., bar	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0	—		
Lead, pig, Soft Foreign	do.	11	0	0	—		
Do. do. English common brands	do.	11	5	0	11	7	6
Do. sheet, English 3lb per sq. ft. and upwards	do.	11	17	6	—		
Do. pipe	do.	12	5	0	—		
Nails, cut clasp, 3in. to 6in.	do.	9	0	0	—		
Do. floor brads	do.	8	15	0	—		
Steel, Staffs., Girders and Angles	do.	5	15	0	6	5	0
Do. do. Mild bars	do.	6	10	0	7	0	0
Tin, Foreign	do.	107	0	0	107	10	0
Do. English ingots	do.	110	0	0	110	10	0
Zinc, sheets, Silesian	do.	21	0	0	—		
Do. do. Vieille Montaigne	do.	21	10	0	—		
Do. Spelter	do.	16	15	0	17	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec, Yellow	per load	4	7	6	6	0	0
Do. Pitch	do.	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	10
Do. Petersburg	per bundle	0	0	9	0	0	0½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	13	0	0	18	15	0
Do. do. 2nd "	do.	16	0	0	—		
Do. do. White	do.	9	5	0	—		
Do. Swedish	do.	13	15	0	16	15	0
Do. White Sea	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st	do.	17	10	0	—		
Do. do. 2nd	do.	10	0	0	12	15	0
Do. do. 3rd &c.	do.	8	5	0	10	15	0
Do. Canadian Spruce, 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	6	2	6	12	5	0
Flooring Boards 1in. prepared, 1st	per square	0	10	0	—		

A Pamphlet about our Three Insurance Schemes, giving full particulars of the advantages which readers are enabled to secure, will be sent post free on application to:—The Manager, BUILDERS' JOURNAL, Effingham House, Arundel Street, Strand, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
Jan.	30	Bristol—Enlargements of Sessional Courts and Offices	Council	H. Williams, Architect, Imperial Chambers, Corn Street, Bristol.
„	30	Styal, Cheshire—Cottage Homes	Chorlton Union Guardians	J. B. Broadbent, 15 Cooper Street, Manchester.
„	30	Bradford—Enlargement of Operating-Room at Infirmary.	—	Milnes & France, Architects, Bradford.
„	30	Kingston-on-Thames—Porter's Lodge, Wards, &c.	Union Guardians	J. Edgell, Clerk, Union Offices, Coombe Lane, Kingston-on-Thames.
„	30	London, N.E.—Repairing Chimney Stacks	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„	30	Manchester—Subway for Electric Cables	Corporation	City Surveyor, Town Hall, Manchester.
„	30	Woodhouse Mill—Stores and Five Houses	Industrial Co operative Society, Ltd.	Hensoll & Paterson, 18 Norfolk Road, Sheffield.
„	30	Blisland, Churchtown—Inn	—	Mr. Dawson, Royal Oak Inn, Blisland, Bodmin.
„	31	London, E.—Alterations to Infirmary	St. George's-in-the-East Guardians	G. A. Wilson, Hopetoun House, Lloyd's Avenue, Fenchurch St., E.C.
„	31	Bradford—Lych-Gate	Corporation	F. E. P. Edwards, City Architect, Chapel Lane, Bradford.
„	31	Brynmawr, Wales—Repairs, Painting and Papering to Public Houses.	—	Griffen Hotel, Brynmawr.
„	31	Lytham, Lancs—Engine and Destructor Houses and Cottage.	Urban District Council	A. J. Price, Engineer, Lytham.
„	31	Thurlstone—Two Houses	—	G. Moxon, Central Chambers, 26 Church Street, Barnsley.
„	31	Penygraig, Wales—School	Ystradfellte School Board	T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.
„	31	Westport—Alterations to Town Hall	Committee of Management	E. J. Gallagher, Secretary to Committee, Westport.
„	31	Salford—Central Fire Station	—	H. Kirkley, 134 Deansgate, Manchester.
Feb.	1	New Mills—Infirmary	Hatfield Union Guardians	Garlick & Flint, 5 Terrace Road, Buxton.
„	1	Glasgow—Hospital	Parish Council	D. Wilkie & Son, 53 Bothwell Street, Glasgow.
„	1	Wrexham—Caretakers' Houses	Town Council	Borough Surveyor, Guildhall, Wrexham.
„	1	Lisnaskea—Teacher's Residence	—	T. Adams, Lisnaskea.
„	3	Bridgend, Glamorgan—Temporary Block, Electric Plant House.	—	W. E. R. Allen, Clerk, County Council Offices, Cardiff.
„	3	Brighton—Alterations and Additions to "The Grange"	Corporation	F. J. C. May, Borough Engineer, Town Hall, Brighton.
„	3	Merthyr Tydfil—100 Houses	Urban District Council	Council's Surveyor, Town Hall, Merthyr.
„	3	Ballinamallard—Methodist Church and Residence	—	T. J. Crozier, Ballinamallard.
„	3	Shenfield, Essex—Cowbyre and Farmhouse	—	L. H. Marshall, Surveyor, Chippenham.
„	3	Darlington—Pair of Semi-detached Cottages	Sewage Farm Committee	Borough Surveyor, Town Hall, Darlington.
„	4	London, N.—Extension of Electric Lighting Station	Shoreditch Borough Council	J. R. Dixon, Engineer, Town Hall, Old Street, E.C.
„	4	Southend-on-Sea—Boundary Walls at Sanatorium	Corporation	A. Fidler, Borough Surveyor, Southend.
„	4	Wakefield—Stronghold, Staircase, at Registry Offices	West Riding County Council	J. Vickers-Edwards, County Surveyor, Wakefield.
„	4	Pudsey—Four Houses and Shops	—	T. A. Buttery & S. B. Birds, Exchange Buildings, Queen St., Morley.
„	5	Charlton—Repairs, &c., to Wharf House	Greenwich Borough Council	Borough Engineer, Town Hall, Greenwich Road, Greenwich.
„	5	Hull—Central Police Station	Corporation	J. H. Hirst, City Architect, Town Hall, Hull.
„	5	Norwich—Picture Gallery	Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
„	5	Newport, Mon—Power Station and Car Sheds	Council	Borough Engineer, Town Hall, Newport, Mon.
„	6	Cardiff—Engine House, &c., at Pumping Station	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
„	6	Radcliffe, Lancs—Octagonal Brick Chimney	Urban District Council	W. L. Rothwell, Engineer, Council Offices, Radcliffe.
„	6	Retford—Church	—	T. Glen, junr., Accountant, Union Street, Retford.
„	7	Treorky, Wales—18 Houses	—	M. Falcon, 33 Bute Street, Treorky.
„	7	Blenau Gwent, Wales—Rebuilding Chapel	Primitive Methodists	A. Jones, Rosebery Street, Abertillery.
„	7	Crumlin, Mon—House	—	R. L. Roberts, Architect, Abercarn.
„	7	Kirkcaldy—Carpenter's and Plasterer's Work to Tramcar Depôt.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„	8	Leeds—Police Station and Free Library	Watch Committee	W. H. Thorp, 61 Albion Street, Leeds.
„	8	Londonderry—Residence	W. N. M'Guiness	J. P. M'Grath, 28 Carlisle Road, Londonderry.
„	8	Shrewsbury—Headquarters Police Offices	Standing Joint Committee	A. T. Davis, County Surveyor, Shire Hall, Shrewsbury.
„	10	London, S.W.—Cement, Lime, Bricks, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
„	10	Eastbourne—Technical Institute, Library, Science and Art Schools, Fire Station, &c.	Corporation	Borough Engineer, Town Hall, Eastbourne.
„	10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	D. J. Lougher, Engineer, Pontypool.
„	10	Stockton—Church	Baptist Connection	T. W. T. Richardson, 57 High Street, Stockton.
„	11	Whitehaven—Infirmary	Guardians	G. Boyd, 33 Queen Street, Whitehaven.
„	11	Porthcawl, Wales—Gardener's Cottage	—	S. H. Stockwood, Solicitor, Bridgend.
„	17	Stamford—Engine-House, &c.	Corporation	J. B. Everard, 6 Millstone Lane, Leicester.
„	18	Wrexham—Alterations, &c., to Market, &c.	Town Council	Borough Surveyor, Guildhall, Wrexham.
„	18	London, E.—Block of Artizans Dwellings	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
„	20	Dromalane, Newry—24 Villa Residences	—	W. J. Watson, Benvenue, Rostrevor.
„	26	Belfast—Technical Institute	Corporation	S. Stevenson, 83 Royal Avenue, Belfast.
„	28	Lurgan, Ireland—National School	Presbyterian Church Committee	H. Hobart, Architect, Dromore, co. Down.
		ENGINEERING:		
Jan.	30	Manchester—Tunnel	Improvement and Buildings Committee	City Surveyor, Town Hall, Manchester.
„	30	York—Road Bridge over Railway and Retaining Wall	North-Eastern Railway Co.	W. J. Cudworth, Engineer's Office, York.
„	30	Meltham, Yorks—Sewage Purification Works	Urban District Council	J. B. Abbey & Son, 34A New Street, Huddersfield.
„	31	Celbridge, Ireland—Heating Operating-Room at Infirmary.	Workhouse Guardians	F. Shortt, Clerk, Celbridge.
„	31	Lytham, Lancs—2 Centrifugal Pumps, Dynamos, Crane	Urban District Council	A. J. Price, Engineer to Council, Lytham.
„	31	Purleigh, Essex—Small Bridge	Essex County Council	P. J. Sheldon, Chief Surveyor, County Offices, Duke St., Chelmsford.
„	31	Chelmsford—Oil Engine	Rural District Council	J. Dewhirst, Engineer, Avenue Chambers, Chelmsford.
„	31	Johannesburg—Carburetted Water and Gas Plant	—	Crown Agents for the Colonies, Downing Street, London.
„	31	Paignton—Waterworks	Urban District Council	F. W. Vanistone, Engineer, Palace Chambers, Paignton.
Feb.	1	Gwyrfai, Wales—Waterworks	Rural District Council	E. Evans, 8 Castle Street, Carnarvon.
„	2	Rochdale—Switchboard Extensions	Corporation	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster.
„	3	Dunfermline—Bacteria Beds, &c.	Fife County Council	D. Mackenzie, Master of Works, County Buildings, Dunfermline.
„	3	Falkirk—Waterworks	Eastern District Committee	Warren & Stuart, 94 Hope Street, Glasgow.
„	3	Stocks, near Slaidburn—Girder Bridge	Rowland Rural District Council	J. Eastham, Clerk, Clitheroe.
„	3	Huddersfield—Tramways	Corporation	K. F. Campbell, Borough Engineer, 1 Peel Street, Huddersfield.
„	3	Bridgend, Glamorgan—Heating Asylum Block, &c.	County Council	Clerk of Works, Parc Gwyllt Asylum, Bridgend.
„	4	Wolverhampton—Tramway Track, &c.	Tramways Committee	Borough Engineer, Town Hall, Wolverhampton.
„	5	Sedgley—4 Gas Purifiers	Urban District Council	Manager, Gasworks, Sedgley.
„	5	Southend-on-Sea—Piles and Steps at Pierhead	Corporation	A. Fidler, Borough Surveyor, Southend.
„	5	Calcutta—Waste-water Meters	Corporation	F. Gainsford, Secretary to Corporation, Calcutta.
„	6	Sunderland—Tramcar Bodies	Corporation	J. F. C. Snell, Borough Electrical Engineer, Town Hall, Sunderland.
„	6	Groomsport, co. Down—Improvement of Harbour	County Council	County Surveyor, Courthouse, Downpatrick.
„	10	Sebastopal, near Griffithstown—Re-erecting Bridge over Canal.	Panteg Urban District Council	D. J. Lougher, Engineer, Pontypool.
„	12	Newcastle-on-Tyne—Railway Bridge and Approaches	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
„	12	Penshaw Junction and Wapping Bridge—Widening Line.	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
„	12	Watford—Gasholder Tank, &c.	Gas and Coke Co.	H. E. Jones & Son, Engineers, Palace Chambers, Westminster, S.W.
„	13	Manchester—Condensers, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
„	17	London, E.C.—Widening London Bridge	Corporation	City Surveyor, Guildhall, E.C.
„	19	Louvain, Belgium—Lighting City	—	Burgomaster, Louvain, Belgium.
Mar.	4	London, S.W.—Electric Tramcars	London County Council	County Hall, Spring Gardens, S.W.
„	28	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
„	31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers, Rockhampton, Queensland.
		FURNITURE:		
Jan.	31	Withington, Lancs—Filments and Furniture at Sanatorium.	Urban District Council	J. B. Broadbent, 15 Cooper Street, Manchester.
Feb.	4	Knutsford—Furnishing Master's Block at Workhouse	Bucklow Union Guardians	G. Leigh, Clerk, Union Offices, Knutsford.
„	5	Sunderland—Furnishing Workhouse Infirmary	Guardians	W. & T. R. Milburn, 20 Fawcett Street, Sunderland.
„	10	Ramsgate—Blinds for Infectious Diseases Hospital	Isle of Thanet Joint Hospital Board	A. B. Burrows, 72 High Street, Ramsgate.
		IRON AND STEEL:		
Jan.	30	London, E.C.—Cast-iron Sinkers for Buoys	Trinity House Corporation	C. A. Kent, Secretary, Trinity House, London.
„	30	London, E.C.—Steel Buoys	Trinity House Corporation	C. A. Kent, Secretary, Trinity House, London.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL—*continued.*		
Jan. 30	London, E.C.—Railway Stores	Great Indian Peninsula Railway Co.	J. I. Berry, 48 Copthall Avenue, E.C.
„ 30	Christiania—Water Pipes, &c.	Norwegian State Railways	Head Engineer, Narvik.
„ 31	London, E.C.—Railway Stores	Bengal-Nagpur Railway Co., Ltd.	Secretary, 132 Gresham House, Old Broad Street, E.C.
Feb. 3	London, N.W.—Iron Castings, Ironmongery, &c.	Hendon Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
„ 3	Grimsby—Ironmongery, &c.	Corporation	H. G. White Borough Engineer, Town Hall, Grimsby.
„ 4	London, E.C.—Machines, &c.	Bengal-Nagpur Railway Co., Ltd.	Secretary, 132 Gresham House, Old Broad Street E.C.
„ 4	Manchester—Steel Pipes and Collars	Waterworks Committee	G. H. Hill & Sons, Albert Chambers, Albert Square, Manchester.
„ 4	Market Harborough—Iron Posts and Rails	Urban District Council	Coales & Johnson, Bank Chambers, Market Harborough.
„ 10	London, S.E.—Iron, Steel, Ironmongery, Gas Fittings, &c.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
„ 10	London, S.W.—Castings, Lamp Columns, Iron, Steel	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth S.W.
„ 10	Belfast—Railway Stores	Belfast and County Down Railway Co.	S. J. Brittain, Secretary, Queen's Quay Terminus, Belfast.
„ 12	Portsmouth—Ironmongery, Castings, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Portsmouth.
„ 15	Plymouth—Ironmongery, Ironwork, Bolts, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
	PAINTING AND PLUMBING:		
Jan. 30	Manchester—Hot Water System	Prestwich Union Guardians	Mr. Chambers, Workhouse Master, Delanney's Road, Crumpsall.
„ 31	Brynmawr—Repairs, Painting, Papering Public Houses	——	Griffin Hotel, Brynmawr.
Feb. 3	Manchester—Painting (10 Contracts)	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
„ 3	Stafford—Cleansing, Distempering & Painting Markets	Markets and Tolls Committee	W. Blackshaw, Borough Hall, Stafford.
„ 4	Newcastle-upon-Tyne—Painting and Cleaning Baths and Washhouses.	Corporation	Property Office, Town Hall, Newcastle.
„ 5	King's Lynn—Plumbers' Work	Corporation	Borough Surveyor, Town Hall, King's Lynn.
„ 5	Crumpsall—Redecorating Workhouse Chapel, &c.	Manchester Guardians	A. J. Murgatroyd, 23 Strutt Street, Manchester.
„ 7	Kirkcaldy—Plumbers' Work at Tramcar Depôt	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 10	London, S.W.—Painters' Materials	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
„ 11	London, S.E.—White and Red Leads, Painters' Sundries.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
„ 12	Stratford, E.—Painting, Graining, &c., at Court House	Essex County Council	F. Whitmore, County Architect, Shire Hall, Chelmsford.
„ 12	Portsmouth—Brushes, Paints, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Porstmouth.
„ 13	London, S.E.—Brushes, Oils, Colours, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Town Hall, Kennington Green, S.E.
„ 15	Plymouth—Paint, Glass, Brushes, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
	ROADS AND CARTAGE:		
Jan. 30	Reading—Improvement Works	Sanitary Authority	J. Bowen, Borough Surveyor, Town Hall, Reading.
„ 30	Harwich—Steam Roller and Scarifier	Council	A. E. H. Ward, Town Clerk, Church Street, Harwich.
„ 30	Atherton—Street Works	Urban District Council	Council's Surveyor, Atherton.
„ 30	Atherton—Materials	Urban District Council	Council's Surveyor, Atherton.
„ 30	Middlesbrough—Street Works	Streets Committee	Borough Engineer, Middlesbrough.
„ 31	Canterbury—Granite	Berks County Council	R. J. Thomas, County Surveyor, County Hall, Canterbury.
„ 31	Cheadle, near Manchester—Street Works	Urban District Council	E. Sykes, Surveyor, Public Offices, Cheadle.
„ 31	Cowes, Isle of Wight—Granite	Urban District Council	J. W. Webster, Surveyor to Council, Cowes, Isle of Wight.
„ 31	Aylesbury—Granite	Bucks County Council	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
Feb. 1	Norwich—Granite	Norfolk County Council	T. H. B. Heslop, County Surveyor, Norwich.
„ 1	Sleaford, Lancs—Granite	Urban District Council	E. Clements, Clerk, Council Offices, Sleaford.
„ 1	Kyo, Durham—Filling-up Playground	School Board	G. T. Wilson, 121 Durham Road, Blackhill.
„ 1	Aylesbury—Flints	Bucks County Council	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
„ 1	Mitcham—Granite Spalls	Holborn Union Guardians	J. A. Battersby, Clerk, Holborn Union Offices, Clerkenwell Rd., E.C.
„ 1	Norwich—Materials, &c.	Norfolk County Council	T. H. B. Heslop, County Surveyor, Norwich.
„ 3	Withington, Lancs—Tar Macadam	Urban District Council	A. H. Mountain, Surveyor to Council, Willenhall.
„ 3	Grimsby—Road Materials, &c.	Corporation	H. G. Wyatt, Borough Surveyor, Town Hall, Grimsby.
„ 3	Huddersfield—Materials	Corporation	K. T. Campbell, 1 Peel Street, Huddersfield.
„ 3	London, N.W.—Materials, Horses and Carts	Hendon Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
„ 4	Walmer, Kent—New Roads	Walmer Estates Co., Ltd.	Hinds & Son, Estate Agents, Walmer.
„ 4	Leyton—Brooms, &c.	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton.
„ 4	Leyton—Materials, Horse-Hire and Cartage, &c.	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton.
„ 4	Rochester—Six Dust Vans	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
„ 4	London, N.E.—Wood-Paving	Hackney Borough Council	N. Scorgie, Borough Engineer, Hackney, N.E.
„ 4	Acton, W.—Making-up, &c., Road	District Council	D. J. Ebbetts, 242 High Street, Acton, W.
„ 5	Acton Green, W.—Forming Roads	——	E. Monson, Architect, Grosvenor House, Acton Vale, W.
„ 5	Dartford—Kerbing, Channelling, &c.	Urban District Council	W. Harston, 8 Hythe Street, Dartford.
„ 5	Kettering—Granite	Rural District Council	C. W. Lane, Union Workhouse, Kettering.
„ 6	Larne, Ireland—Steam-Rolling	Urban District Council	W. G. Younge, Clerk, Town Hall, Larne.
„ 6	East Retford—Road Materials	Rural District Council	T. Henry, Surveyor, Retford.
„ 6	London, W.—Making-up	Ealing Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
„ 7	Hertfordshire—Granite and Slag	County Council	U. A. Smith, 41 Parliament Street, Westminster, S.W.
„ 7	Stockport—Road Works	Corporation	J. Atkinson, Borough Surveyor, Central Buildings, St. Peter's Gate, Stockport.
„ 7	Stockport—Materials	Corporation	J. Atkinson, Borough Surveyor, Central Buildings, St. Peter's Gate, Stockport,
„ 8	Isle of Ely—Materials	County Council	H. F. Simpson, County Surveyor, Wisbech.
„ 10	London, S.W.—Materials, Paving, Horse-Hire, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
„ 11	London, S.E.—Materials, Paving, Brooms, &c.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
„ 12	Portsmouth—Stores, Street Works, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Portsmouth.
„ 13	London, S.E.—Materials, Cartage, &c.	Lambeth Borough Council	H. Edwards, Borough Enginer, Town Hall, Kennington Green, S.S.
„ 15	Plymouth—Road Metal, Brooms, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
„ 18	Long Sutton, Lincs—Granite and Slag	Urban District Council	S. S. Mossop, Clerk, Long Sutton.
„ 22	Belper—Material	Rural District Council	R. C. Cordon, Surveyor, Duffield, near Derby.

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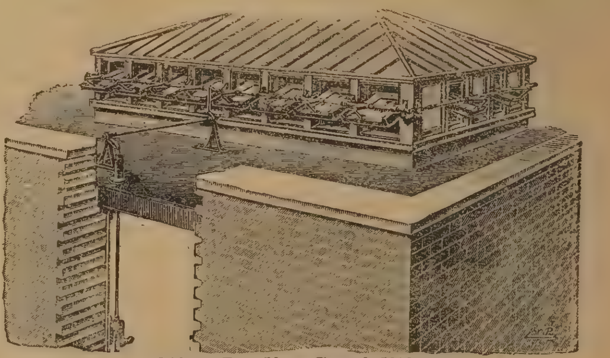

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		SANITARY;		
Jan.	30	Meltham, Yorks—Sewage Purification Works ..	Urban District Council	C. H. Marriott, Son & Shaw, Civil Engineers, Church Street Chambers, Dewsbury.
Feb.	1	Silkstone, Penistone, Yorks—Drainage Works.. ..	Rural District Council	T. W. A. Hayward, Borough Surveyor, Town Hall, Sudbury.
	3	London, N.W.—Scavenging, House-Drainage, Disinfectants, &c.	Hendon Urban District Council	J. B. Abbey & Son, 34A New Street, Huddersfield.
"	3	Walmer, Kent—12in. Sewers	Walmer Estates Co., Ltd.	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
"	3	Grimsby—Disinfectants, Drain Pipes and Traps, &c...	Corporation	H. G. Whyatt, Borough Surveyor, Town Hall, Grimsby.
"	5	Acton Green, W.—Pipe Sewers and Manholes	—	E. Monson, Architect, Grosvenor House, Acton Vale, W.
"	8	Sudbury, Suffolk—Sewerage Works	Corporation	Hinds & Son, Estate Agents, Walmer.
"	10	London, S.W.—Stoneware Pipes, Drain Testers, Disinfectants, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
		TIMBER:		
Feb.	1	Cairo—Timber	—	Financial Secretary's Office, Cairo.
"	4	London, N.E.—Wood-Paving	Hackney Borough Council	N. Scorgie, Borough Surveyor, Hackney, N.E.
"	5	Rochester—Cleft Oak Fencing	Joint Hospital Board	H. P. Mann, 44 High Street, Chatham.
"	10	London, S.W.—Timber	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan.	31	Bangor—Infants' School [Local Architects Only] ..	—	A. C. Downes, Clerk to Bangor School Board, Tanyfron, Bangor.
"	31	London, S.W.—Workmen's Dwellings	£50, £25, £10.	W. M. Wilkins, Town Clerk, Municipal Buildings, Lavender Hill, S.W.
"	31	Hull—Art School (cost not to exceed £10,000) ..	£100, £60 and £40.	E. Laverack, Clerk, Town Hall, Hull.
"	31	Newport, Isle of Wight—Queen Victoria Memorial ..	£25	W. O. Rymer, Secretary to Memorial Committee, 20 Holyrood Street, Newport, I.W.
"	31	Liverpool—Rebuilding Children's Infirmary [Six Architects to be Selected].	£50 each.	Colonel C. F. Bell, 17 Fenwick Street, Liverpool.
Feb.	1	Glasgow—Dwellings for the Poor	£100, £50, £25.	Town Clerk, City Chambers, Glasgow.
"	4	Mountain Ash, Wales—Municipal Offices	£75.	J. Williams, Surveyor to U.D.C., Town Hall, Mountain Ash.
"	26	Kanturk, Ireland—Water-Supply Scheme	£20.	T. Guiney, Clerk, &c., Rural District Council, Workhouse, Kanturk.
Mar.	1	Aldershot—Laying-out Pleasure Ground	£20, £10, £5.	N. F. Dennis, Surveyor, Urban District Council, Offices Aldershot.
"	5	New Malden, Surrey—Public Offices, Fire Station, Mortuary, &c.	£25, £10.	C. T. Lewis, Clerk, Maldens and Coombe Urban District Council, 7 Market Place, New Malden.
"	29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
April	4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May	1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	—	Agent-General for State of Victoria, 15 Victoria St., Westminster.
"	14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June	30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	—	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept.	1-14	St. Petersburg—Bridges over Great Neva River ..	—	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.		Carlisle—Racecourse Grand Stand, Offices, &c. ..	2nd £10; 3rd £5.	Secretary, Race Stand Co., Ltd., 15 Howard Place, Carlisle.
"		Audenshaw, near Manchester—Cemetery Buildings ..	—	W. Clough, Surveyor, Urban District Council's Offices, 2 Guide Lane, Audenshaw.

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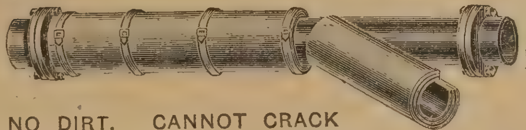

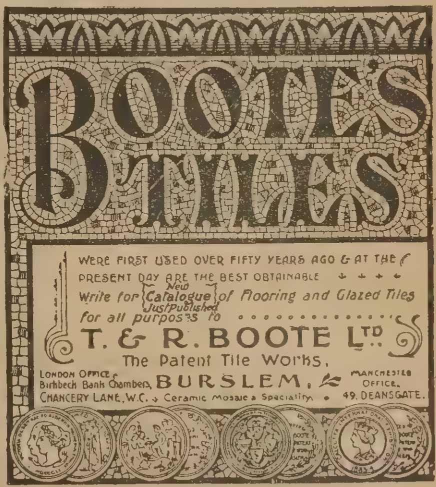
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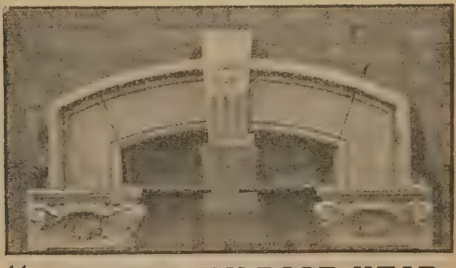

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Masters and Men.

The Limerick Carpenters' Strike, which has been in existence since May last, has just been settled on the basis of a compromise that the payment shall be by hour instead of by week.

A Dispute at Birmingham has arisen. Trade has been depressed recently, and the employers gave notice of certain reductions in wages. In the case of plasterers and masons a reduction of 1d. per hour was notified; masons' fixers it was proposed to reduce by ¾d. per hour, and other branches of the trade by ½d. per hour. Moreover, certain modifications in the rules are suggested, with a view to securing uniformity of weekly hours. Joint conciliation meetings will be held early in February.

The Bradford Joiners' Strike. — When the masons' strike in Bradford was settled recently it was hoped that the joiners' dispute would also be ended without further delay. Unfortunately there is no sign at present of any such accomplishment. Up to May last, when the strike commenced, the joiners were receiving 9d. an hour; and when the masters gave notice of a reduction of 1d. the men retaliated with a demand for 1d. increase. Since then the men have come back to 9d., and the masters have raised their figure to 8½d. The difference between 8½d. and 9d. still constitutes an integral part of the dispute. Of the original 500 men affected only about 200 remain out of employment.

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Registered to acquire the business of Samuel Dowsing (deceased), formerly carried on at 26, Pembridge Road, Notting Hill, and elsewhere in London, and to carry on business as builders, painters, paper-hangers, and decorators, manufacturers of and dealers in building materials, gas, electric and sanitary engineers, ironmasters, dealers in coke, bricks, files, cement; as carpenters, timber merchants, &c. Capital £4,500 in £1 shares. The first directors are A. F. Dowsing and H. A. Hanson.

A. Shepherd & Co., Ltd.

Registered to acquire the business of sawmill owners carried on by J. W. Shepherd & Co, and the business of timber importers and sawmill owners carried on by A. Shepherd & Co. at Alexander Docks, Grimsby; to adopt an agreement with J. W. Shepherd and A. Shepherd, and to carry on the business of timber importers and merchants, sawmill owners, packing-case and rolling-board makers, joiners, cabinet-makers, builders, &c. Capital £7,000 in £1 shares. Registered office: Alexander Docks, Great Grimsby, Lincolnshire.

South Yorkshire Coal and Coke Co., Ltd.

Registered to buy and sell coal, coke and other articles of fuel, bricks, tiles, sanitary pipes, lime and other mineral substances; to acquire the goodwill of the business of the Lewden Colliery Co., and to carry on the business of colliery owners, miners and coal and coke merchants generally. Capital £5,000 in £1 shares. Registered office: Hunningley Villa, Stairfoot, Barnsley.

Whyman's Foundry Co., Ltd.

Registered to acquire the Hope Ironworks at Dallam Lane, Warrington, Lancashire, and generally to carry on business as metal founders, engineering in all its branches, mechanics and machinists, makers of ornamental fire-places and stoves, of metal colliery proprietors, lamp manufacturers, brick, tile and terra-cotta merchants, patent fuel makers, &c. Capital £7,000 in £1 shares. The first directors are Thomas Whyman, Thomas Baxendale and G. Baxendale.

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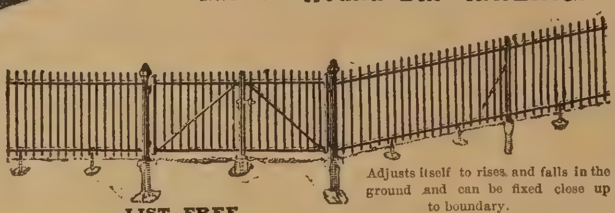

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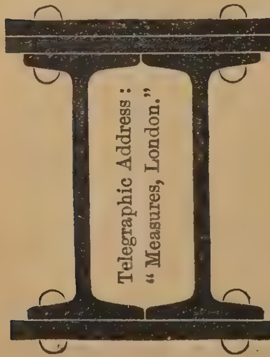

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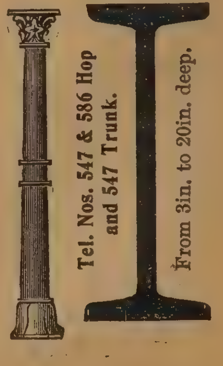

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Mr. Bodley, R.A.

THE voting for the honours of the Academy is always followed with much interest, and last week's election of Mr. G. F. Bodley as an Academician will be regarded with unmixed satisfaction. No official intimation is ever given as to whose place is to be filled, and at the voting the impression prevailed that the vacant fauteuil was that of Mr. Norman Shaw, who a short time ago tendered his resignation (but has since reconsidered it); whereas in reality the vacancy was caused by the death of Mr. Onslow Ford. Several of the Associates received single votes in the first ballot, but serious support was given only to Messrs. Swan, Frampton, Macbeth, Bodley and Waterlow. All these artists went to the second or "blackboard" stage (having received at least four votes), and in this contest Messrs. Bodley and Frampton secured the greatest number of votes. In the final ballot, confined to Messrs. Bodley and Frampton, the architect beat the sculptor by a single vote, twenty-nine to twenty-eight: on which he is to be congratulated. Mr. Bodley, whose ecclesiastical work is too well known to need any special reference, became an Associate in 1882.

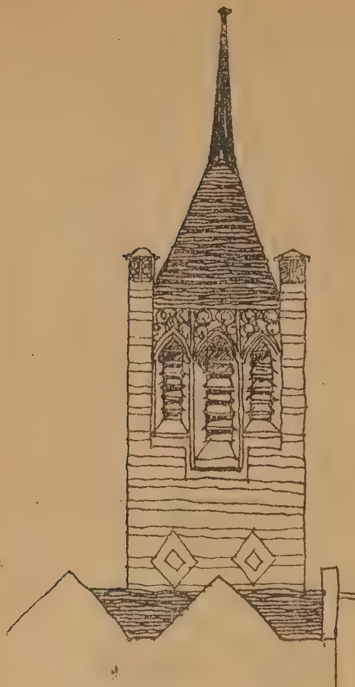
Coronation Decorations.

OUR civic fathers have begun, none too soon, their preparations for the Coronation; and there seems to be some real desire to retrieve our disreputable past in the matter of decoration. "The Times" in an excellent leader last week feels that "it is really time to do something better. What is the good of Royal Academies and National Schools of Art—the latter kept up at no small cost to the country—unless their influence can impose a systematic scheme which shall make London look, at the solemn inauguration of a new reign, not only gay but beautiful?" Gaiety and beauty are terms too often confounded. Gaiety can be accomplished with that blaze of crude colour vulgarly yclept the "Irish stew" decoration, a crash of discords productive of bibulence and "horseplay." Beauty is a tender chord of three notes of equal value—simplicity, dignity and harmony. It harbours a more chastened feeling than mere rejoicing, and thus is appropriate to the occasion. For the function has its solemnities. The coronation of the King is no honour personal to his Majesty, but a proclamation to the world of the majesty of the people in the person of their sovereign. The subject of the decoration should be a beautiful exposition of the fitting symbolisms of the ceremony. The Westminster City Council have begun rightly by adopting a set scheme of decoration for that district; and other councils will, it is to be hoped, follow this good example. So far only two schemes have been made public; but the occasion will doubtless call many more into existence. One by Mr. Vigers suffers much from over-elaboration and consequent loss of dignity. The idea of gilt figures poised upon coloured celluloid globes in which electric lights are burning sounds fearsome. Arches too should only be employed to emphasize particular portions of the route; they obstruct the view, and the route is too short to symbolize all the Colonies and public institutions and virtues to the detriment of the sightseer. Neither should one scheme be imposed upon the whole route, or monotony will quickly kill the effect. If each district adopts a distinct harmony of colour and design a pleasing variety will inevitably result. The second scheme, prepared by Mr. Selwyn Image for THE ARCHITECTURAL REVIEW, appears in the current issue of that magazine. It is a simple and dignified effort for the short route of the actual Coronation procession from Buckingham Palace to the Abbey. Not the least of its merits is the consideration which the author has accorded the Abbey. The most important point in any scheme is to fit the decoration to the buildings; not the buildings to the decoration. Westminster Abbey is "consecrated by centuries of unspeakable tradition through which his Majesty passes to his solemn dedication." To attempt to decorate it would be an impertinence. It must therefore remain in its own solemn majesty the most impressive piece of decoration on the whole route.

G. F. BODLEY, R.A.

The London Backyard.

BURNS'S cry that we might see ourselves as others see us is not always consonant with a truer or less biased opinion. Some time ago we were rather amused to read in a well-known American architectural contemporary that Londoners have one custom which our friends desire to see introduced into New York. Those who reside in or are familiar with London will doubtless learn with surprise that the backyards of the houses in the Metropolis are rendered attractive, decorated with flowers, and made to serve a purpose quite impossible to any New York backyard. "There is usually a balcony overlooking the yard, which is ornamented with growing plants until it might be taken for a conservatory. The imagination of decorators is allowed to exercise itself in all sorts of ways in making beautiful this part of a London house." It may be fairly assumed that the writer who gives this glowing account of the London backyard has never seen one: for the place is more often than not a depressing smoke-begrimed area which is not infrequently prejudicial to health, an opinion which is confirmed by Dr. Sykes in his recently-published book on "Public Health and Housing." Of the flower-bedecked balcony which might be mistaken for a conservatory we know nothing, and as regards the decorators' imaginations we should prefer to remain silent, though we cannot refrain from expressing pleasure in learning that they possess imagination.



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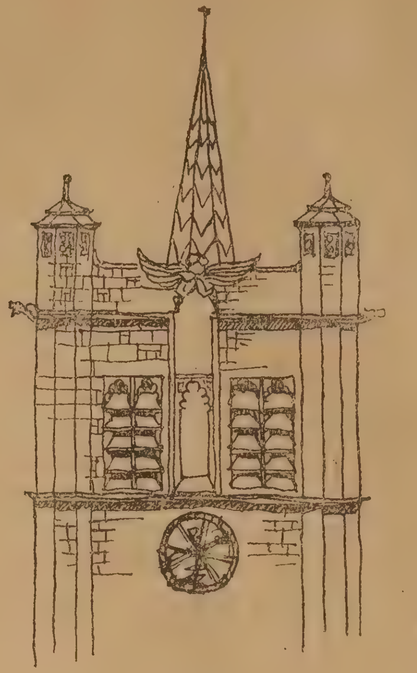

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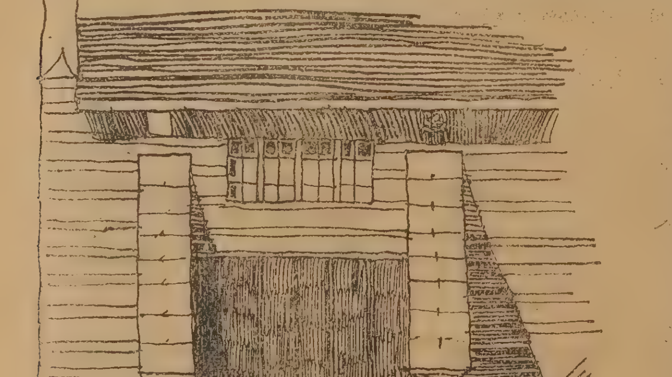
BIRMINGHAM SCHOOL OF ART.

Annual Exhibition.

THE annual exhibition of students' work in connection with the Birmingham Municipal School of Art is now being held in the rooms of the Society of Artists, and remains open till February 7th. Though the subjects set are good, the architectural section (which is under the able direction of Mr. W. H. Bidlake, M.A., Mr. C. E. Bateman and Mr. Herbert T. Buckland) is not up to the standard of former years. Of the designs for a village church there are only three worth mentioning. That by Mr. W. Jones is fairly good, but the author, in his effort to be original, goes too far, and the pointed arches (like that of the porch, No. 305) are not pleasing; the tower, however (No. 306), deserves mention. The design numbered 301 is, if anything, a better design: the tower is shown among the accompanying illustrations (302). No. 297 is a neat set of ink drawings, with an ordinary plan. There are several good designs shown for a village railway station, that by Mr. Augustus S. Reeves being the best; moreover, his drawings are straight-forward, and not "faked" like those of several other students. Another good design is that by Mr. Norman E. Twist; the footbridge across the lines is very simply and pleasingly treated. No. 283, by Mr. Ernest C. Harrison, is also good. The subject of "A Mission Hall" has drawn a good many students, and of these the design numbered 294 (by Mr. E. L. Cashmore) is specially worthy of note. Mr. S. N. Cooke's design (No. 311) for a lodge to a country house is attractive, though it could be greatly improved if the blue brick were omitted and stone used in its place. Mr. F. Goldsbrough's design would look decidedly better without the "Voysey" buttress, but the chimney stack is good. The measured drawings shown in the exhibition are satisfactory. Mr. Norman E. Twist sends some fine pencil sketches and drawings of favourite parts around Wells, and Mr. Ernest C. Harrison exhibits work from the neighbourhood of Oxford. No. 321 sends in a measured drawing of a modern public-house!—a strange work to select. On the whole the architectural exhibition is not so good as the decorative section, where the design by No. 342 for a chimney-piece and the cast model (No. 204) of a statue of Queen Victoria are most deserving of praise.



PORCH TO A VILLAGE CHURCH, BY W. JONES (No. 305).

ARCHITECTURAL ASSOCIATION.

"ORIGINALITY" IN ARCHITECTURAL DESIGN.

By C. HARRISON TOWNSEND.

A MEETING of the Architectural Association was held on Friday evening last at 9, Conduit Street, W. (Mr. Howard Seth-Smith, president, in the chair). After the minutes of the last meeting had been read and confirmed, Mr. H. H. Christie, Mr. A. L. W. Sampson and Mr. R. S. Wilkinson were elected members of the Association. It was announced that the Second Spring Visit would take place on February 15th to the Victoria and Albert Museum, by kind permission of Mr. Aston Webb, A.R.A.

The president then announced the following additional donations to the New Premises Fund:—

	£	s.	d.
Merchant Taylors Company - -	105	0	0
M. Garbutt - - - - -	10	10	0
A. T. Walmisley - - - - -	5	5	0
E. H. Parkes - - - - -	2	2	0
"A.A. Student" - - - - -	1	16	6
W. E. Hewitt - - - - -	1	1	0
D. A. Forster - - - - -	1	0	0
	126	14	6
Donations previously announced	3,589	18	0
Total - - -	£3,716	12	6

The president announced that a class on perspective (Mr. W. G. B. Lewis, lecturer) would commence on February 12th and a class on ventilation, lighting and heating (Mr. Max Clarke, lecturer) on February 13th.

Mr. C. Harrison Townsend, F.R.I.B.A., then read his paper on "'Originality' in Architectural Design." He said:—

I deplore the inefficiency of the presentment of this subject, the more that I feel it to be quite one of the most important that you could meet to consider. For it does not propose to add to minds perhaps already largely stored another item or series of items of knowledge, but it offers for consideration what to do with the sum total of all the learning you have up to now acquired and will in the future acquire. And it suggests the subjection of the isolated facts of learning to a synthesis that shall resolve them into one organic whole.

Lectures on styles, papers on materials, demonstrations on methods, these and the daily experiences of your work all help to fill your minds with the data of certain indispensable knowledge. Yet even profiting to the full by these opportunities, and bringing to them even the most unflagging industry and the most retentive of memories, you are then face to face with the question of how to get the most complete outcome from this mental equipment. And the doubt arises whether a store of facts and a mass of knowledge are all that go to the making of an architect. Does the fact that you are—even generously and widely—educated, that you have at your finger-tips any amount of knowledge of materials and construction, and that you possess a full acquaintance with the historical remains of architecture handed down to us from other days—does all this do more than make you *ready to be* an architect? Does it, as a matter of fact, constitute you one in the proper sense of the word? And unless something breathes these dry bones of knowledge and tradition into life, is their possessor more than a skilled "practitioner"—a thoughtful and cultivated "professional man"?

I am here by no means raising the tattered banner on which is inscribed the wearying question "Is architecture an art or a profession?" I care little whether it be an art or a profession, or, for the matter of that, a trade. Whichever we term it, however, a man's fitness to be and claim to call himself an architect are not to be estimated and gauged by the measuring-standard of what he has learnt. It is not by what he knows, but by what he does with what he knows, that he shall be judged. It is for him to throw into the crucible of his own nature all his learning and all his knowledge, there to be fused and made one, and out of that melting-pot to draw an ingot that is to be stamped and shaped as his own personality, his own individualism, shall determine. As Marcus Aurelius says: "Is it not a grievous thing that an architect shall respect the course and mysteries of his profession more than the proper course and condition of his own nature?" That is to say, that too great a regard for that course and those mysteries, or, to put it otherwise, the attachment of undue importance to formulæ and rules, causes a positive atrophy of the imaginative and creative faculty, by which an artist—the architect as well as the painter and sculptor—should claim to be appraised.

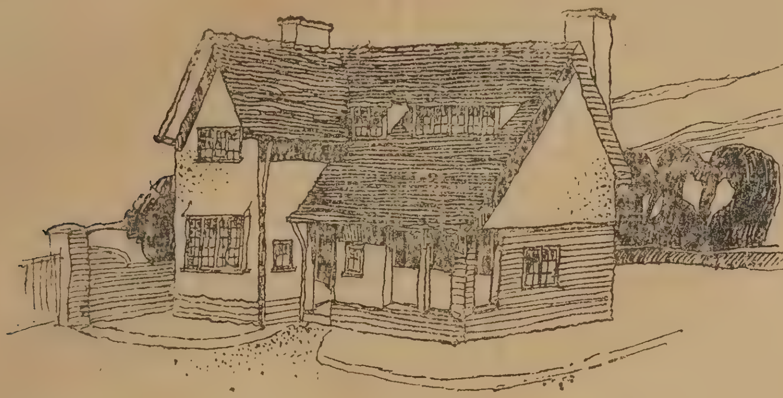
> "To follow foolish precedents, and wink
> With both our eyes, is easier than to think."

Yet precedents and traditions must need exist and endure in every art, and it would be presumptious to claim to be in art absolutely free, and to have shaped oneself rather than to have been made by the great thoughts and the great men that were of old time before us. There is no logical standpoint for him who disclaims and disavows all reference to, all dependence upon, all reverence for the past, and whose ideal is the substitution of his own ignorant lawlessness for the lessons handed down to him from other times. Such a one, I imagine, would without remonstrance accept and adopt the term "anti-historical" applied the other day in one of our weekly papers to express the aims in art of one of those architects whose views I am trying to put before you now, and could not consistently rejoin that he claimed to be individual in expression—*not* original and creative. Nor could he further maintain, as that criticised architect would, that he was in fact *more* truly historical and following *more* closely along the lines of architectural evolution than the many mimics of the forms into which architects of distant countries or of bygone days have cast their thoughts and their ideals.

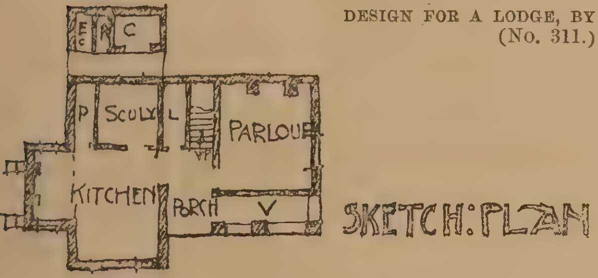
Here, let me ask, is there justification for alleging that any—or, at all events, let me say that any considerable number of—architects have in set terms foresworn allegiance to tradition, and have claimed the right to apply the word "original" to their works? I think not. Individual in method of expression, yes; non-resurrectionists of long-since dead and buried styles, yes; haters of mimicry of earlier forms that were expressions of earlier wants and needs, again, yes. I know those who are glad to come under those categories, and I venture to think that in their hands lies the future of our art.

Yet, remember, that in thus doing your best to make your architecture speak To-day rather than the Past, you are not to strive, of set purpose, to be what you or others may call "original." As Lowell says in one of his letters, "When a man *aims* at originality, he acknowledges himself unoriginal." You will find it both grand ideal and hard task enough to try to let your work reflect you yourself and to give it a personal and individual character. If it thus bears your own impress, what more "originality" need it have or can it have?

But this quality must come of itself; it must result not from the attempt to do what other men have never yet done, but from your wish to shape your work so because it seems to you the best solution of the problem before you. And, having worked out this—your own—solution you neither adopt nor, on the other hand, repudiate it, because others have arrived at this result before you.



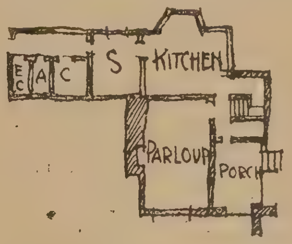
DESIGN FOR A LODGE, BY S. N. COOKE.
(No. 311.)

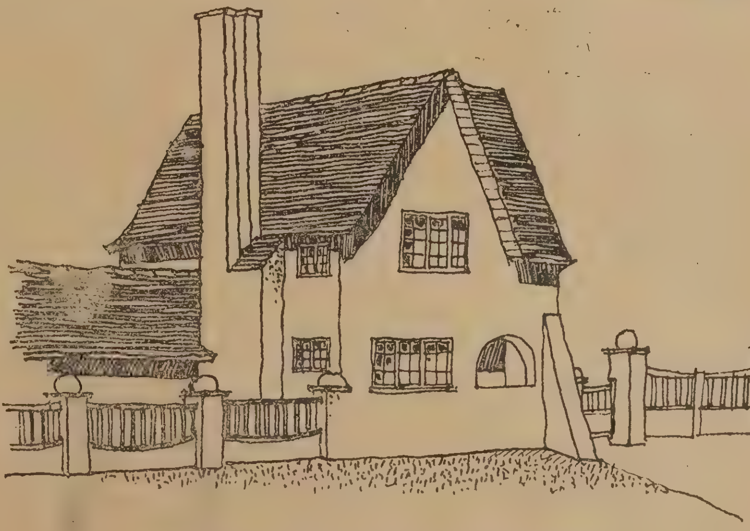


We have in architecture, as I have said above, a speaking living tongue, and if the thick mists of custom and conventions allowed us to see it, nothing can be more illogical than for us of to-day to borrow the language of Byzantium or Florence or Amsterdam in which to give our message in this Year of Grace 1902, or to rely upon a thirteenth- or fourteenth-century vocabulary as a means of expressing architecturally our own religious needs and aspirations. While our language, as we now read or speak it, comes to us enriched by that of other days, it yet has the distinct stamp and impress of its time, and to express our wants or tell our tale one to another we do not in book or conversation deliberately adopt the spelling or the speech of Chaucer or of John Florio or even of Addison.

Yet is not this precisely what we do in architecture? Is not the measure of praise bestowed upon a modern building in exact proportion to the faithfulness with which its designer has worked on the lines of other times—Mediæval, Elizabethan, Georgian, or what not; or to the closeness with which he has imitated the architecture of, I know not what country—Holland, Italy or France? Is a man ashamed, as he should be, when he is told that his building (*his*, mind you, finished to-day or yesterday, in 1902, in 1901) is "so faultlessly Elizabethan that it might well be taken for an old building of that date?" Does he feel insulted, as he should, when he is assured that "in general design as in every detail his church is conceived and worked out in a thirteenth-century style?"

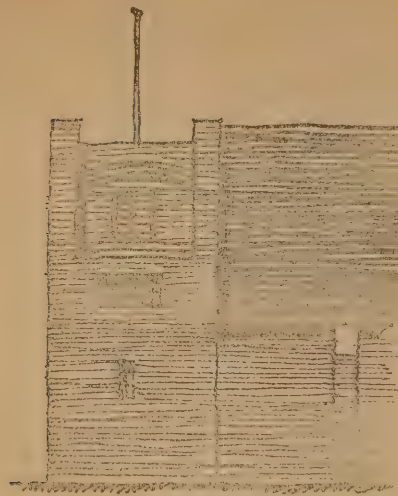
I know it will here be said that there are less extreme cases than these, and I shall be reminded that there exists that vaguely qualifying phrase, "a free treatment" of such-and-such a style, which is supposed to represent a saving grace, and to oblige us to approve a design which is not, like those others, all copyism, but one with, say, 75 per cent. of imitation and 25 per cent. of "free treatment." This seems to me to be a distinct concession towards the point of view I am speaking of, and even this modicum of freedom is to be welcomed, and we ought to be thankful for, at any rate, such proportions as I have suggested. Yet these might conceivably be reversed if the architect's mental attitude when face to face with a problem of design were different to—and, as I think, more logical than—the usual one, and one might then hope to find, let us say, 75 per cent. of spontaneous individual personal feeling in the design, and the 25 per cent. residue, if it did happen to be reminiscent of other and preceding work, would not, at all events, be so because of an avowed desire to recognise closeness to the designs of earlier men as the ideal towards which one should strive.





DESIGN FOR A LODGE, BY F. GOLDSBROUGH.

An architect may (and I am, as I have said before, glad to say he usually does) tone down the rigid exactitude of a sheer copy by more or less admixture of his "free treatment." But how often does he not sit down at his drawing-table with the acknowledged intention of producing a "Gothic design"—a "Renaissance design" (both of them with or without that wonderful "free treatment")—or, indeed, as it sometimes happens to-day, a design in which all architectural graces are to be laboriously and effectually omitted altogether in the name of simplicity? And selecting from a well-stored memory—I refrain from suggesting dependence



(No. 287.)

upon Kodak, or reference to sketch-book—a certain form or fashion or style, does he not proceed to clothe his building with the particular material his mental pattern-book suggests, and to rely for his design more upon the achievements of the past than upon his own invention and his own imagination of the present?

I have said more than once he may refer to and ask the past to help him to a solution; he must not depend on it to find him that solution.

In literature, a few years ago, we were all keenly touched to hear an American critic of much note tell us that "all the tales have been told." He was more wrong than even most makers of epigram; and we felt that while men and women are, and while lives are happy or are sad, and while hopes are hoped or frustrated, and while hearts are blithe or breaking, there are still at each turn and every moment tales, comic and tragic both—unwritten, it is true, but there, and only waiting the writer.

And in our own art, are all the tales exhausted, and are we at best to repeat—in perhaps slightly, very slightly, different words—those that our fathers told, with here a change of adjective and there an added or a diminished emphasis, with this trifling omission, that small addition? Did our tales, ours as architects, stop short a hundred years ago, leaving us tongue-tied and silent unless we speak a Georgian speech and talk in the eighteenth-century words of our great-grandfathers? (I do not stop here to ask if even their architectural utterances were the best to which they might have attained, and if they—and their fathers in turn—were not, at most, speaking in a kind of dog-Latin—or dog-Roman rather—more false and unnatural even than the would-be Classic Pastorals and Eclogues of their literature. That would be to discuss what *their* aims might and should have been. I am considering what ours of to-day should be.)

As their language helps us of to-day to speak, so their architecture is an element in our education; and education should merely fit us for that design for which we too often find it substituted. If in a given building we have, for instance, to carry a weight, let us admit that our beam or bressummer need not necessarily be borne by a column modelled, with more or less faithfulness of copy, upon what the Greeks or the Romans or the builders of the Middle Ages have done before us. It is *our* weight, to be carried in *our* way, and it is for us to think out the problem of how best to make and shape and fashion the column to do *our* work, not to solve our difficulty by borrowing their method.

Sydney Smith's profane one, who was, like Talleyrand's *père de famille, capable de tout*, and who even went so far as to speak "disparagingly of the equator," was, I imagine, the most orthodox of persons compared with him who, in this room and to this audience, ventures to breathe a doubt as to the supremacy and all-but-sacred character of the Corinthian column, and whose architectural agnosticism looks with the same unorthodox eye alike upon the "Five Noble Orders of Architecture" and the various "Periods" under which archæological architects have tried to catalogue Gothic architecture.

Such a profession of want of faith is sure to be met—I have heard it over and over again—by what is supposed to be a crushing *ad hominem* rejoinder. The sceptic is told that till he shall, in the first place, himself produce, or, in the second, shall put forward evidence that it is possible for himself or others to produce, a column that shall approach even within measureable distance of the Greek model, it were better that he held his presumptuous tongue, and—like his interlocutor—were content to recognise that the Corinthian order gives architects the best and highest and final expression of the column possible. And, further, that thus recognising it, he should feel happy and grateful for so good a thing to copy. (Of course, by the way, he need not adopt the actual word "copy," but may use a more refined method of expressing the same thing, and refer to it as his "precedent" or "the source of his inspiration.") In answer to which I would urge that, while no art is entirely and absolutely "upon all fours" with another, and admitting that analogy is generally a somewhat specious method of argument, I think it quite a fair and legitimate request to ask you to put to yourselves for a moment this problem of dependence upon the great achievements of the past in the terms of another art. Let us see, for instance, how it looks when presented to us, not as an architectural, but as a literary question.

There were great Greek architects—say, for example, Callimachos, or Scopas or Ictinos—who wrought with their highest power and skill upon a certain factor in design common to them all—the Corinthian column—and produced examples of this beautiful feature which are recognised as reaching the highest possible point of attainment of which it is capable. They obeyed at the same time all the necessary conditions—their column has base, shaft and capital; it has proportion; it suggests strength where that quality and expression are called for, and elegance where æsthetic claims demand it. The result is beautiful beyond question.

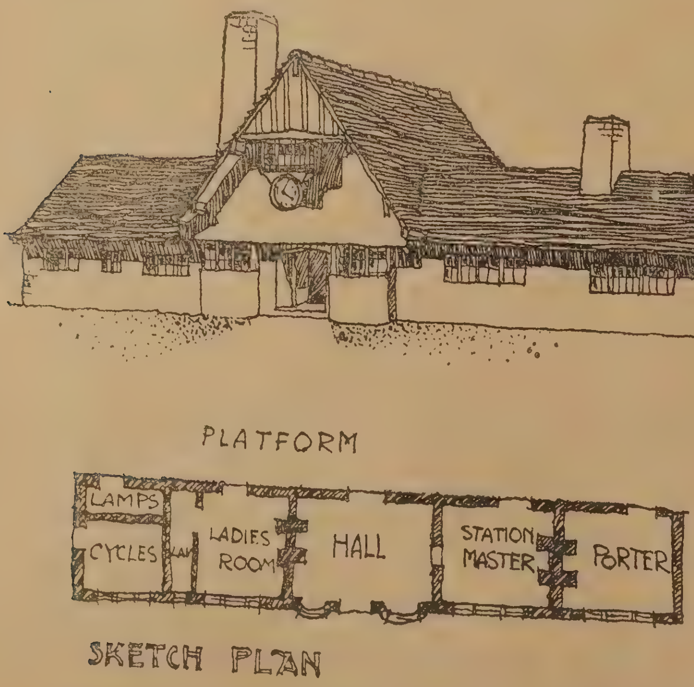
Well, let us now, as our parallel in literature, turn to poetry, and taking the sonnet let us posit, for the sake of my illustration, that Shakespeare, Wordsworth and Keats have written the finest and most perfect verse in this particular form of which our language can boast. And for the further purposes of my argument I take these, the three greatest writers of sonnets, as the equivalents in literature to those who created the most perfect productions of Greek architecture. Then, if we regard both these great architects and these great poets from the same logical standpoint, it is no straining of argument that puts us into the position to paraphrase what we already say to the modern architect, and to cry to the would-be sonnet-writer of to-day, "Hands off! The most supreme shape in which you feel your thoughts could mould themselves is not for you! Do you forget that through Shakespeare or Wordsworth or Keats the greatest sonnet that the world has seen has already come into being? With perfection thus attained, why ask us to be satisfied with less? Are you then so presumptuous as to offer us your own poor thoughts in your own halting words simply because they *are* yours and because you feel that only thus can you speak your own message? No! The best is written, and for you remains at most humbly and reverently to offer us more or less imitative variants of that great work."

Do not misunderstand me on an important point in connection with this illustration. I am taking the sonnet—a form common to all poets—as the parallel to the column in general—a feature common to all architecture. You cannot allege that my position is the ridiculous one that because great men have used them we ought to abandon the sonnet-form in poesy, or the column in our own art. My point is that in architecture we copy—whether we call it so or not—what we consider the very finest example of the past, calling the result architecture, and it would be but a mere "parity of reasoning" if we were in the same way to copy absolutely the most perfect sonnet of Shakespeare and to call that result our poetry. It should influence every poet; no poet should copy it. The column of Ictinos should influence every architect; no architect should copy it.

Or let us imagine, again, a poet of the past who has breathed into his verse the fullest and most satisfying expression of the mystery and beauty of the dawn, and whose noble lines reveal to us, in highest degree, its very soul and essence. Is, let me ask, the wonderful and supreme beauty of this achievement of former days to silence, as if it were sacrilege, the voice of later poets who also hear what Nature has to say when another day is born? Are they to be told that it is for them presumption to try to sing the dawn, and that its spirit and sentiment, and charm and beauty have been, once and for all, seized hold of, and cast into so perfect a form that it is rank profanation to touch the theme again?

It is only in bricks and stone that we express our wants and ideals by means of borrowed Elizabethan phrases rather than in our vernacular; only in our churches that we imitate the archaism of Chaucer—an "English undefiled," it is true, but his of the fourteenth century, not ours of to-day.

I am not contending that copyism does not find its way into other arts than ours, but I do urge that at most they copy the methods, the



DESIGN FOR A VILLAGE RAILWAY STATION, BY AUGUSTUS S. REEVES.

technique, the principles of other men and other schools; they do not, like us architects, copy the actual work. Our only invention is in the rearrangement of other men's thoughts; our only thought how to re-dispose other men's inventions. And even if in some degree imitation and copyism exist in the other arts, ours is the only one *based upon it.*

We do not and we will not call it copyism or imitation, but we use a hundred-and-one qualifying expressions to soften down those words. We talk of our "precedent," our "source of inspiration," of the "freedom with which such-and-such a style has been treated," of the "fresh and clever way in which the architect has dealt with his limitations of style," and so on, and so on. But all these phrases do is to express that the work is not a strict copy; that it is but in part imitation; that the pretence is dropped at times and it is not all mimicry. They do but mean that, here and there, the architect was tempted to think for himself. As a matter of fact, these occasional lapses into heterodoxy are regarded with a good deal of that suspicion natural to the orthodox, and the regular practitioners are pained and shocked at any departure from those recognised and traditional formulæ which they themselves have christened architecture.

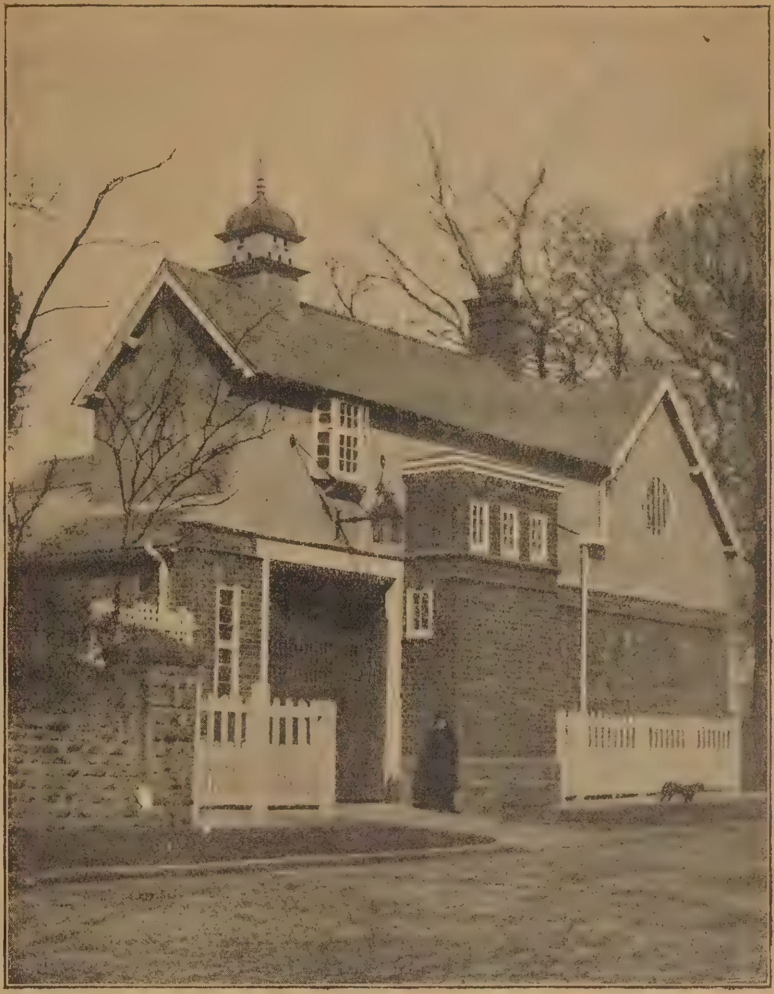
Yet, for myself, I welcome these lapses, and would fain see them more frequent and their scope wider, till at length the "free treatment" spread over the whole building.

You will remember that I spoke above of designs which were so far daring as to show a quarter of individual and spontaneous thought, as compared with three-quarters of dependence upon recognised style. I advocate no impossibility, or unattainable ideal, when I plead for at least a reversal of those proportions, and that your work shall show your own personal thought and individual ideas as by far the larger element in the design. Face your design—your plan or elevation, or tower, or door, or cornice—as your own work which you must do in your own way, resolving to infuse it with the qualities you feel it ought to possess to represent *you*, and not with those that memory points out as being necessary to some selected style.

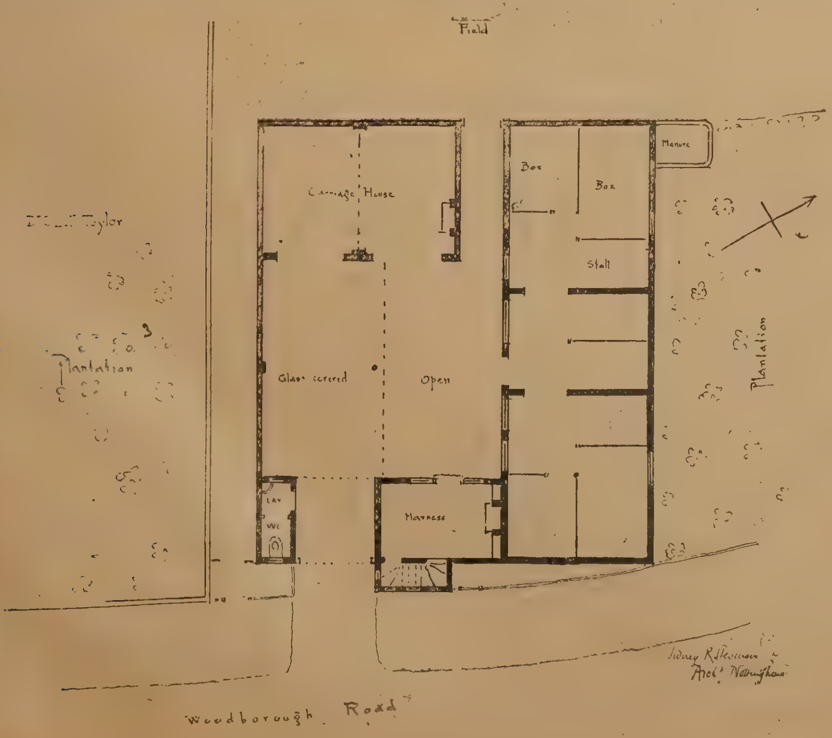
I am no despiser and contemner of that accumulated experience we call tradition, and in asking for our release as architects from the necessity to conform to the styles of other days and countries I recognise as much as anyone the need of education, and that acquaintance with the highest achievements of other men that best fits us to express ourselves also at our best. As Sidney Lanier puts it, "Once for all, in art to be free is not to be independent of any form; it is to be master of many forms."

I am not asking you, as I said before, to try to be "original," but I *am* begging you not to copy. And to start intending to shape an architectural design upon the lines of any style must, of necessity, imply copyism on a greater or less scale.

It is in placing individualism, fully equipped by education, before stylism that one sees the possibility of architecture becoming once more a speaking tongue, by the means of which man's wants and ideals of to-day shall be clothed in the outward shape those wants and ideals ask, and not in the worn-out trappings of the past or the mouldered cerements of times for ever dead.



STABLING AT NOTTINGHAM FOR DR. C. BELL TAYLOR. SIDNEY R. STEVENSON, ARCHITECT.



Let me conclude with one of E. Wharton's apologues:—

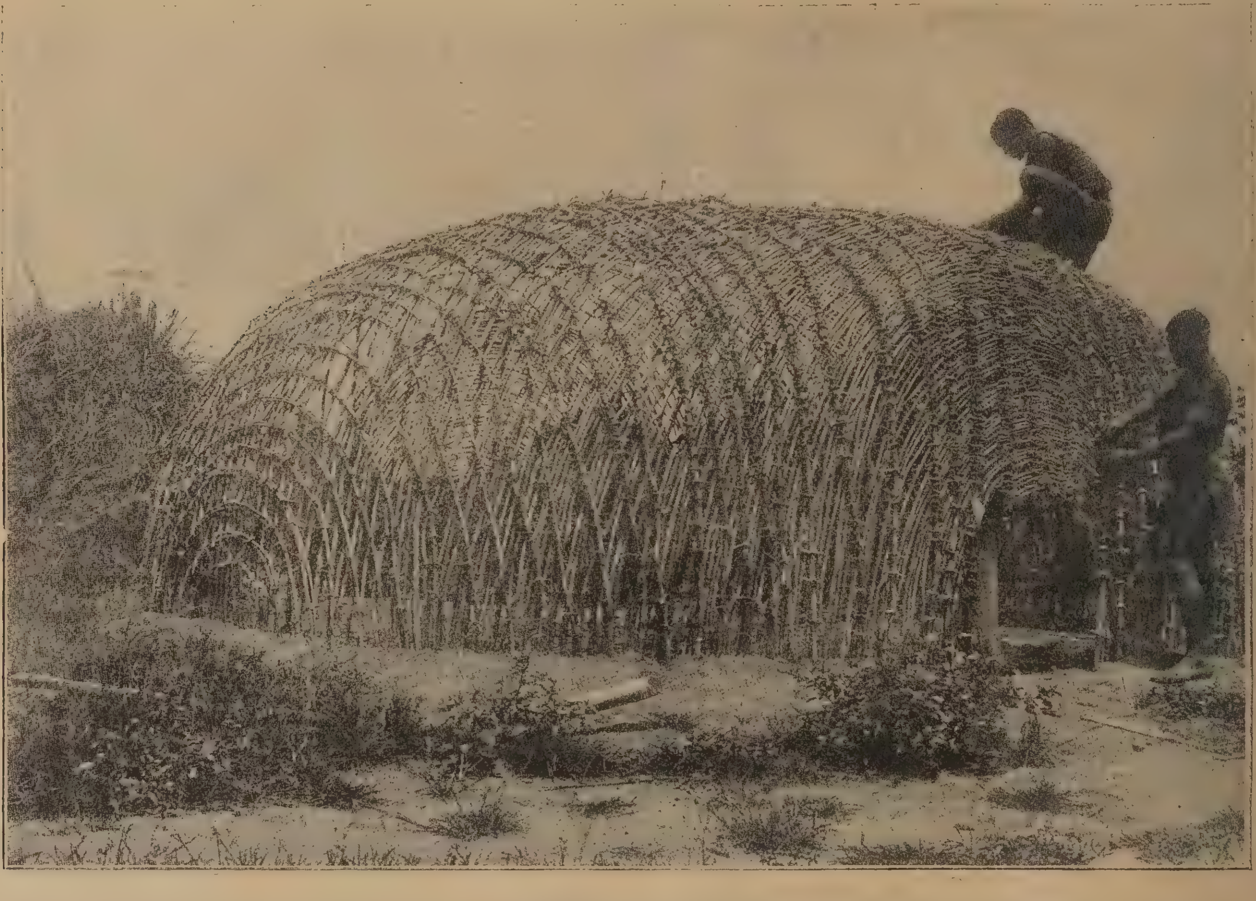
"There was once a man who had seen the Parthenon, and he wished to build his god a temple like it. But he was not a skilful man, and try as he would he could only produce a mud hut thatched with straw; and he sat down and wept because he could not build a temple for his god. But one who passed by said to him, 'There are two worse plights than yours. One is to have no god; the other is to build a mud hut and mistake it for the Parthenon!'"

To which I add this rider: "Nay," said another passer-by, "you would have built a better temple to your god had you had an ideal of your own, and so no need to copy—even the Parthenon."

The Discussion.

Mr. Henry T. Hare, F.R.I.B.A., in proposing a vote of thanks to the lecturer, said that, although it would be agreed mere copyism was demoralizing, at the same time he did not think Mr. Townsend in condemning all copyism looked at the matter so broadly as he should. The development of architecture was not a matter of a few years or even generations, and he did not think the Victorian architects would come to be regarded as such utter copyists as we might now consider them to be. All architecture was based on the study of tradition and what had gone before, and in every generation the majority of men had only mediocre capacity in translating their studies into their work, which would be more or less a copyism; yet there would always be one or two men having sufficient individuality to produce something living. He did not think that one would call Street a copyist, though he did work in the Gothic style; and nobody would say that Cockerell was a mere copyist. The men of the Renaissance revival, although working more or less on the lines of Classic architects, could not be termed copyists: the work of Palladio and Inigo Jones was full of originality. Everyone could not be expected to possess sufficient individuality to create original ideas, and he thought it safer for the majority that they should confine themselves to work on purely traditional lines rather than to strike out new paths for themselves. At the same time he was of opinion that Mr. Townsend's paper would do good, and students should not forget that no amount of originality could take the place of the hardest study.

Mr. Francis Hooper seconded the vote of thanks. He also felt that there was some danger in entering upon new paths. After Mr. F. Lishman had made a few remarks, Mr. Alexander Wood spoke. He thought that as Mr. Townsend had based his claims for originality on the study and grasp of the old, he was on the whole quite just; but he doubted whether one could be really original. Even if one avoided books there would be an unconscious influence from the past. He also doubted whether it was possible to absolutely copy, as every new need demanded a new treatment. The president also spoke and Mr. Townsend replied. The meeting then terminated.



NATIVE HUT BUILDING IN ZULULAND.

The Stabling at Nottingham illustrated on the previous page was completed last year for the noted occulist on land adjoining his residence, Mapperley Park, Nottingham. The entrance archway opens into the covered portion of a central quadrangle. Stabling is provided for eight horses—four loose boxes, four stalls—and a carriage house with ample room for four large four-wheeled carriages. Convenient rooms occupy the upper floor over the harness-room and archway. The building was erected by Mr. J. J. Adams from designs by Mr. Sidney R. Stevenson, architect, Nottingham. Messrs. Lewis & Grundy, of Nottingham, supplied the radiators and open fireplaces, as well as the stable and harness fittings. A mash-room, with range, copper, sinks and "fuel," shown on the original plans, had to be omitted owing to the proximity of the house.

Engineering Notes.

The Government's London Water Bill for the purchase of the eight water companies and the constitution of a Water Board of sixty-seven or sixty-nine members, was read a first time in the House of Commons last Thursday.

New City Subway.—A public subway is to be constructed between the Bank Station of the Central London Railway and the Lombard Street Station of the City and South London Railway, at the level of the booking-offices.

A New Electricity Generating Station is being erected by the Manchester Corporation. The building will cover an area of more than eight acres, and, with its sub-stations, will rank as one of the largest erections of its kind in Europe. The estimated cost, when 27,000 horse-power has been provided, is close on a million pound. Plant will eventually be laid to produce 70,000 horse-power.

Society of Engineers.—At the meeting held on Monday evening last, after the premiums awarded for papers read during the past year had been presented by the retiring president, Mr. Charles Mason, the newly-elected president, Mr. Percy Griffith delivered his inaugural address, in the course of which he dealt with water-supply and gas engineering.

The Acetylene Association has now been formed for the advancement of acetylene gas engineering and manufacture. Austria, France, Germany, Italy, Switzerland and the United States have already formed important associations specially devoted to the acetylene interests. England, although the last to establish such an association, was the first country in Europe to commercially manufacture carbide of calcium. "The Journal fo Acetylene Gas Lighting and Carbide of Calcium Review" is the official organ of the Association. Mr. Lacey Downes is the temporary secretary, and his offices are at 11, Ironmonger Lane, E.C. The subscription for ordinary members is one guinea per annum.

New Electric Lighting and Dust Destructor Works at Bermondsey have just been erected by the Bermondsey Borough Council. The new works are situated in Spa Road, at the rear of the town hall and public baths, and they occupy an area of about 1½ acres. The buildings consist of a destructor-house, an engine-room containing the generating plant, a pump and fan-room, an accumulator-room and offices. The destructor-house is specially designed with a view of giving adequate ventilation. It consists of six cells, each having 26 sq. ft. grate area, and capable of destroying 50 tons of refuse in twenty-four hours. The continuous-current system has been adopted. The charge for electric lighting will be 6d. for the first hour and 3d. for each hour afterwards, based on the *minimum* demand system. For motive-power purposes the charge will be 2½d. per unit. In the borough the three-wire system of mains has been adopted, and the feeder mains are at present four in number. With regard to the public lighting there are at present seventy-one standards erected, supporting 10-ampère double carbon arc lamps and incandescent lamps. At 12 o'clock every night the arc lamps are permanently turned out and the incandescent lamps are lighted. The new stables, when completed, will afford accommodation for sixty horses. At present only fifty-four stalls are fitted up. The new depôt also includes workshops, stores, offices and other buildings for municipal purposes. The residuum from the destructor will be used for making pavement flags by means of an electrically-driven hydraulic plant. The machine turns out flags at the rate of twenty-five per hour at a very low cost. The clinker is ground very fine, mixed with a due proportion of cement, thoroughly incorporated, and then subjected to a pressure of 1,000lb. per sq. in. and afterwards allowed to dry.

An Architect Magistrate.—The Lord Chancellor has appointed Mr. George W. Webb, F.R.I.B.A., of Reading, a magistrate for the county borough of Reading.

A Zulu Hut.—The illustration on this page of two Zulus completing the framework of their hut explains very clearly the methods adopted, and is particularly interesting as showing the elementary architecture of savages, which one may fairly judge to be like that of our progenitors.

PARIS: PAST AND PRESENT.*

By HAROLD SMITH, A.R.I.B.A.

ASSUREDLY the city of Paris is greatly indebted to the Seine—the "nursing Seine," as old Father Du Breul rightly calls it—for the infant Paris was cradled amidst its waters. Yes! Paris had its birth in the ancient island of the cité, now marked by the towers of the queen of the French cathedrals, and for several centuries remained invulnerable in its island state. Then, too straitened by its unsularity, it crossed the water on either side. The river then divided Paris into three great divisions—the cité on its island lying in the middle of the stream, like a ship stranded in the mud; the Ville on the northern, and the Université on the southern bank. The lower walls of the high houses soon hemmed in the river, so that its waters were hardly visible; the river disappearing under the bridges, and the bridges being lost amid the houses. At night chains were stretched across the openings in the ramparts where the river entered and left the city, thus preventing all hostile intrusion.

Historically, then, the centre of Paris is the island in the Seine on which stands the cathedral. There are certainly few finer architectural pages than its front, and what is said of the front must be said of the whole church. Everything is complete in this art, at once logical and well-proportioned. But the Paris of Notre Dame was complete only for a moment. Hardly was the tower of St. Jacques-de-la-Boucherie finished, ere they began to rebuild the Louvre. Thus the Gothic Paris, which had superseded the Roman Paris, has in its turn disappeared, and given place to the Renaissance Paris.

The Renaissance in its turn is divided into phases. It is thus that we have the Paris of the Medicis and Valois at the Luxemburg—early product of Italian influence; that of the Bourbons at the Invalides—the drawings for which so excited the ardour of Sir Christopher Wren; that of Napoleon at the Vendôme Column—a bronze shaft of captured cannon; and that of the Restoration at the Bourse. The Revolution alone has left no memorial: its leaders being but "the austere architects of ruin."

Obviously there must be a limit to the energy that a race can at any time put forth; if more be expended in one direction, less can be applied in another. Hence, during the Revolutionary period, there was a marked lack of artistic production. Moreover the closing years of the eighteenth century had seen a great decline in taste and spontaneity of invention. It is true that France had been more active in the decorative arts than her neighbours; a better and more refined taste, a livelier imagination, is still to be traced in the Petit Trianon. But this revival had no scope for architectural expression. So it followed that, as there was no natural sap of inspiration, those who still loved the beautiful sought to revive the fallen estate of architecture by reproducing the glorious fabrics of ancient Rome. This Roman revival culminated in the church of the Madeleine. It, indeed, produced several very stately facades, but did not reform architecture. It was but a fashion, an artistic exotic, corresponding to no change in life or taste.

The Neo-Grec movement was the first sign of the revival from the exhaustion engendered by the Napoleonic wars. It greatly influenced the work of such great artists as Lefuel, Garnier, Ginain and Vandremer. The residence of the last-named in the Rue d'Antin displays at once the powers and limitations of this pseudo-Pompeian revival. It could purify detail: it could not reform design.

The accession of Napoleon III., however, created a new era of architectural activity. Napoleon surpassed Louis XIV. himself as a patron of art, and the Baron Hausmann outdid Colbert. Assuredly, our age has seen nothing to equal the change then wrought in the aspect of Paris. The result was a genuine awakening. The Emperor himself, firmly adhering to his motto, "le carriére ouverte aux talents," did not dictate to his architects. Now, seeing too clearly the faults of the style which thus evolved, it is impossible to fully appreciate the greatness of the advance; or to rightly estimate the debt we owe to the Ecole des Beaux-Arts. For we are undoubtedly its debtors, both for the training of French and foreign artists, and the upholding of sound principles of design and wise standards of taste. Moreover, under the influence of this awakening the Ecole began to teach the doctrines of a more enlightened liberality. Hence the great external variety displayed in the designs of its students, in the main lines of which are so much order and uniformity.

During the second Empire, besides the New Louvre under Visconti and Lefuel, another undertaking of the first rank was commenced. This, the Nouvel Opéra, is certainly the most splendid and palatial structure erected in recent times for purposes of amusement. It cost three millions of pounds and took twelve years to build. With his great daring, Charles Garnier undertook to give monumental expression to the principle "that the exterior masses should interpret the functions of the internal distribution." The emphasising of the great stage-box, of the domical auditorium, and of the state rooms, halls and stairs give a distinctive character to the whole. This great building is well worthy of study. The better we understand the problem, the more we must admire the solution. The general style is that of the Renaissance of Henry II. not uninfluenced by the Neo-Grec movement. In parts (notably the staircase) it appears overladen with ornament; yet above all is the impress of strength, taste and originality: the decrees of necessity expressed in the language of art.

Under the Empire, also, street architecture greatly improved. Pavilions at the street corners and monumental fountains, such as that of Ste. Michel, lent new dignity to the long vistas. Moreover, the impressive avenues and open spaces were made still more imposing by the solidity and beauty of their lamp-posts, clocks and railings. Sculpture, too, plays an important part on the stage of Parisian architecture. Nowhere is there such an abundance of good carving; nor is it confined to buildings of the first importance. In all the designs we note a noble simplicity of composition, due breadth of surface being contrasted with delicacy of design.

Although during the thirty years existence of the Republic there has been no repetition of the Imperial activity, the record is neither unimportant nor uninteresting. The alterations to the Louvre were continued and completed; and the Hotel-de-Ville, which had been destroyed, was rebuilt. The latter is, indeed, an admirable example both in plan and elevation of the skill of the French in solving a monumental problem. It was required that the new building should resemble the ruined one in its general mass, though it might depart radically from it in its general arrangements. Under these limitations MM. Ballu and Depérthes produced a noble design, and the new hotel is in no degree inferior to the old one. It is the most important and the most successful building erected under the Republic; a worthy memorial to the spirit of the architects and artists of our times.

We must not imagine, however, that it is only in buildings of this kind that French architects show their strength of hand and innate refinement of feeling. Almost every suburban château is a testimonial. In houses, however, the best examples are to be found in or near the city. These are innumerable; and so beautiful in their proportions, so quiet, so reserved in their demeanour, so refined in every detail—as to be worthy of the highest praise and closest study. Many there are in which pilasters, cornices, pediments and arches are used in combinations which have been incessantly repeated since they were first employed in ancient Athens; yet used again with a touch of originality so subtle that, while defying analysis, it turns the whole design into poetry.

It is only here and there that isolated fragments, such as the tower of St. Jacques-de-la-Boucherie, remind us of the great Gothic Paris with its innumerable churches and religious buildings. The modern churches are costly and heavy, generally modelled on the Romanesque of Aquitaine. Even the once influential tide of the Gothic revival has ebbed away; and the fairy-like fabrics of mediæval Paris have mostly succumbed to riots and restoration.

Certainly it is hardly possible for the untravelled Englishman to picture the conditions of existence in the old cities of the Continent. Yearly our cities increase and require more space. But in old cities like Paris the same conditions do not obtain. Straitly enclosed within their girdle of fortifications, they cannot spread themselves over the surrounding country. Unable to expand laterally they must ascend vertically. Hence the high houses, those layers of flats, piled storey upon storey, which give to the Parisian streets their aspect of grandeur.

The middle-classes reside principally in these long lines of lofty apartment houses, which are, internally, by no means luxurious. The great height often renders it difficult to secure adequate light or ventilation. Moreover, there is nowhere for children to play; nowhere to air or dry clothes; nowhere, hardly, to shake a duster. The natural restlessness of a nervous and impulsive people is augmented by the lack of domestic quiet. They cannot become attached to their houses by any ties of interest or affection. Hence it is, in looking through this medium of the people, that we discern the truth of the statement, "Great cities are the graves of great nations."

On entering one of these houses the concièrge is first seen flourishing in her lodge. She has a kitchen and another room with a recess. In this recess is the bed, from which, by means of a mechanical device, she can open the street-door to belated inmates. Above the lower storeys, which are devoted to shops, are the flats; and on reaching these the inherent defects in this residential system are at once apparent. Even in the largest apartments the kitchen is near the reception-and bed-rooms. Usually it looks on to an area, and is inconvenient, small and dark. The kitchen boiler is rare, and hot water rarer still. The water tap with the sink—if the house has water laid on to every floor—is placed in the kitchen itself, which is not conducive to visual or olfactory joy. The sanitation frequently leaves much to be desired; and baths as a home institution do not generally exist. Coal or wood has to be fetched from the cellar, five or six storeys down; and as lifts are rare a small stock has to be kept in the kitchen. Such is a fair presentment of an average apartment house in the city of which Victor Hugo wrote, "The smoke of its chimneys is the ideal of the universe."

Whatever be the quality of its chimney-smoke, the artistic refinement and dignity of many of the long facades can hardly be surpassed. It is by no means easy to say which of the various classes of buildings are most deserving of study. Anyone visiting Paris must select for himself; and if he uses due discrimination, cannot fail to glean some useful facts. For, assuredly, nowhere will the artistic appetite be sharper whetted than in the keen intellectual atmosphere of the great art centre.

Rightly the symbol of the city is a ship. For ever upon the deck of Paris one seems to hear the straining, of the spreading unseen sails of human progress.

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* A paper read before the Bristol Society of Architects.

Masters and Men.

The Midland Iron and Steel Wages Board held a meeting at Birmingham last week. The accountants under the sliding scale arrangement reported that they had examined the returns of sales of iron made by the twelve selected firms for the months of November and December and had verified them with the books. The average net selling price was £6 19s. 5·30d. per ton, which will cause the rate of wage to remain unchanged till April.

The Building Trade.—At the annual meeting of the National Federation of Building Trade Employers held in London last week the question was discussed of making an effort to fix the date for the simultaneous termination of all notices with reference to working rules with the operatives, and it was resolved to take the opinion of the federated employers throughout the country upon this point. Questions relating to the adoption of a new form of contract and closer relationship with kindred national associations upon all matters affecting the general interests of the building trade were also under discussion. Mr. B. I. Greenwood (London) was elected president of the federation for the ensuing year.

Bricks and Mortar.

APHORISM FOR THE WEEK.

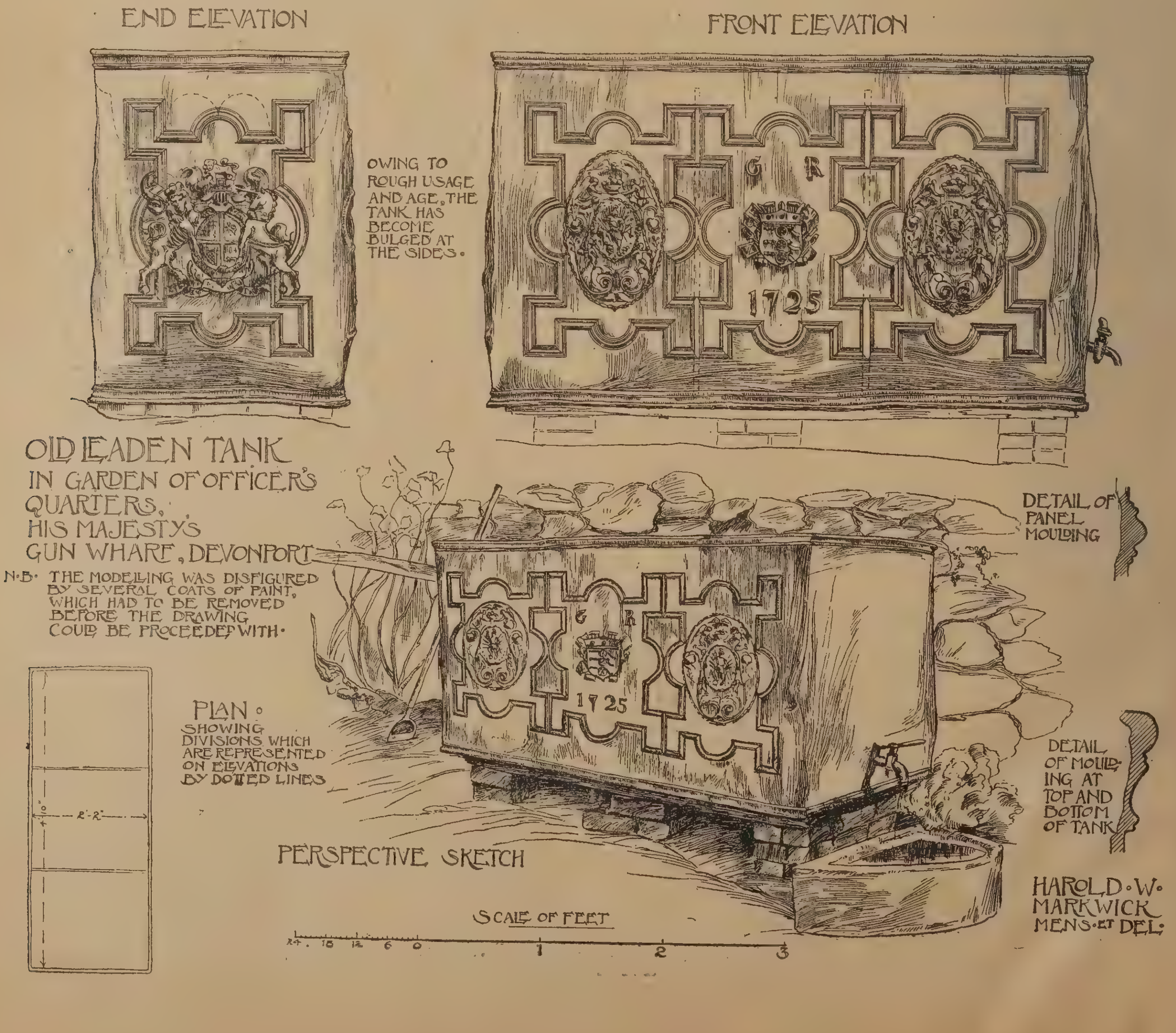
When a man understands the art of seeing, he can trace the spirit of an age and the features of a king even in the knocker on a door.—VICTOR HUGO.

Our Plates. WE illustrate three from the large number of drawings in colour by Mr. Edward H. Bennett which gained for him the Owen Jones Studentship Prize in this year's competition held by the Royal Institute of British Architects. Of the delicacy of colouring in the originals our reproductions hardly give a hint. This studentship will allow him to further his studies of structural colour, which unfortunately is so seldom given heed to in modern architecture.—The design for a public swimming-bath for men in a seaside town by Mr. T. A. Moodie won for him a medal of merit in the competition for the Soane Medallion and £100.

Decay of Glasgow Municipal Buildings. REPAIRS are being carried out on the Municipal Buildings on account of decay having set in extensively in the stonework. The matter appears to be serious. The stone of which the City Chambers were built came from the Bannockburn quarries, considered to be the best in the country, but we understand that the particular quarries from which the stone was taken were newly opened. As a precautionary measure, it was stipulated that the material should lie for a year in the builders' yard for the very purpose of testing its durability. The puzzling thing is that, although it seems to have stood the test, the Municipal Buildings have decayed faster than any other building of a similar character in Glasgow. Reference has been made to the deleterious action of the Glasgow atmosphere, but the fact remains that within a stone's throw of the City Chambers there are far older buildings still in a good state of preservation. A report on the decay has been furnished by Mr. Alexander Muir, of Alexander Muir & Sons, who are the contractors for the repairs at present in progress. It was at one time proposed to cut out whole capitals of pilasters, but on the recommendation of Mr. Muir it has been decided to have the decayed portions cut away and a silicate solution applied for purposes of preservation. In this way £600 has already been spent on the east facade of the buildings alone—that is, facing John Street. It seems that stonework exposed to the east and north is more liable to decay than that to the south and west.

St. Augustine's Chair. A GREAT deal of interest has been aroused in the ancient chair or settle said to have been used by St. Augustine, which is now claimed from the committee of the Canterbury Royal Museum by the Bishop of Hereford on behalf of the vicar and parishioners of Stanford Bishop. The chair is composed entirely of oak, and is devoid of nails or other metalwork, and is declared to be a typical specimen of the work of the carpenter in the first six centuries of Roman rule in Europe, corresponding, indeed, in style and construction with a Roman *solium*, or chair of authority. It is oblong in figure; the outside measurement gives 32in. for breadth and 22in. from front to back, and it is deep-backed, with closed sides or ancons to support the arms. There are evidences, too, that it formerly possessed a board upon which to rest the feet. The seat is an oblong slab of oak 26in. in length by 18in. in depth, originally 2in. thick, and still bearing marks of the tool used in smoothing it. The peculiarity of the seat is that it is movable, like the lid of a box, and the cardines on which it is moved are two round tenons left projecting fron the edges, near the back, and inserted into rounc mortice holes in the rear post. In a monograpl written by the late Mr. James Johnston, M.B Lond., on the subject he endeavoured to shov that an early British church existed at Stanforc Bishop, and that the chair was used by Augustin when attending the celebrated synod of Britisl Christian bishops.

Discoveries in Persia. THE collections brought bacl by M. de Morgan from Persi are to be exhibited in the Granc Palais, Paris, in May and June. The Shah wa so pleased with his visit to France that he mad an offer to M. Delcassé to sign a conventio giving France a monopoly of all the archæological treasures found in the south of hi empire, together with half those found in th north. This he signed on the very day he lef Paris. M. de Morgan, M. Maspero's predecesso in Egypt, was consequently sent out at the hea of a mission. Establishing himself at Susa, h engaged from 600 to 1,200 natives at 50 centime a day, the Shah furnishing military protection An enormous number of epigraphic document have thus been brought to light revealing th names of sovereigns up to 3000 B.C., and stil older antiquities are expected to be found at greater depth. One of the chief discoveries is stone, 2 mètres high, the *stele* of King Naramsin 3000 B.C. There is also the obelisk of Kin Manicthon Irba, being the title-deed of estate in Chaldea, and giving in its 12,500 character the whole geography of that country. There i likewise a splendid bronze table supported b four figures and decorated with serpents, as als a bronze column, 4 mètres high, covered wit inscriptions of the eighteenth century B.C. M de Morgan is assisted in his explorations b Père Scheil, who first deciphered the Elamit language.


END ELEVATION
FRONT ELEVATION
OWING TO ROUGH USAGE AND AGE, THE TANK HAS BECOME BULGED AT THE SIDES.
G R
1725
OLD LEADEN TANK
IN GARDEN OF OFFICER'S QUARTERS, HIS MAJESTY'S GUN WHARF, DEVONPORT
N.B. THE MODELLING WAS DISFIGURED BY SEVERAL COATS OF PAINT, WHICH HAD TO BE REMOVED BEFORE THE DRAWING COULD BE PROCEEDED WITH.
DETAIL OF PANEL MOULDING
PLAN. SHOWING DIVISIONS WHICH ARE REPRESENTED ON ELEVATIONS BY DOTTED LINES
2'-2"
PERSPECTIVE SKETCH
DETAIL OF MOULDING AT TOP AND BOTTOM OF TANK
SCALE OF FEET
24 18 12 6 0 1 2 3
HAROLD W. MARKWICK MENS. ET DEL.

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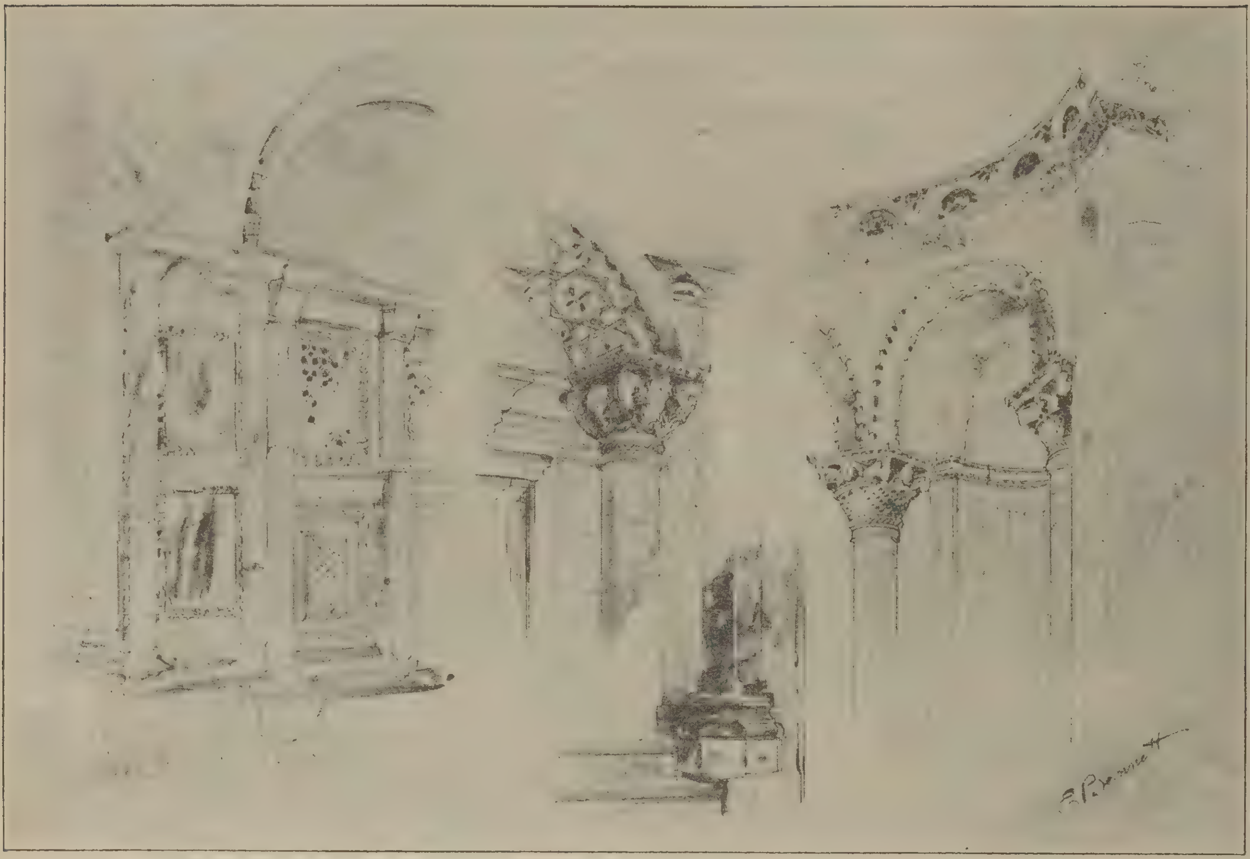
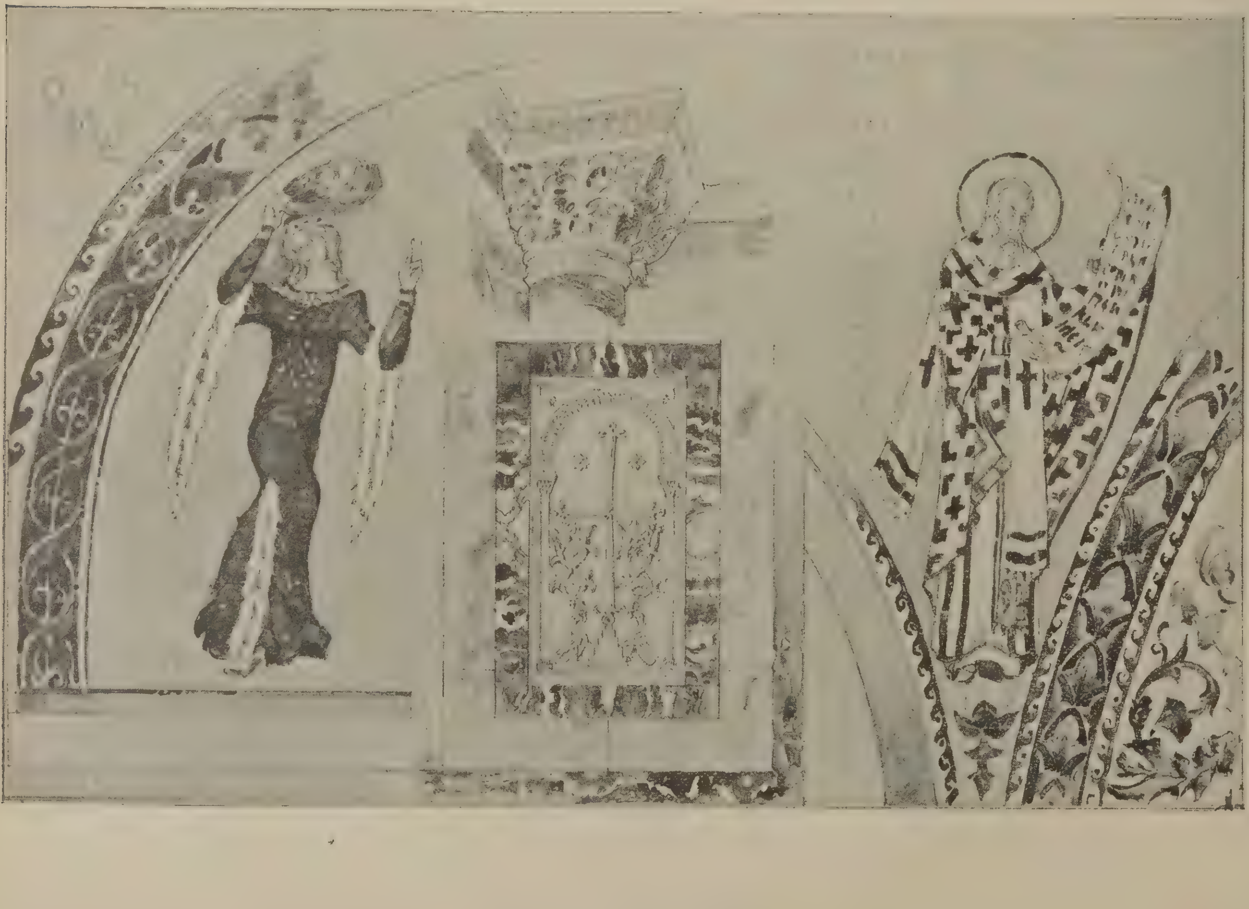
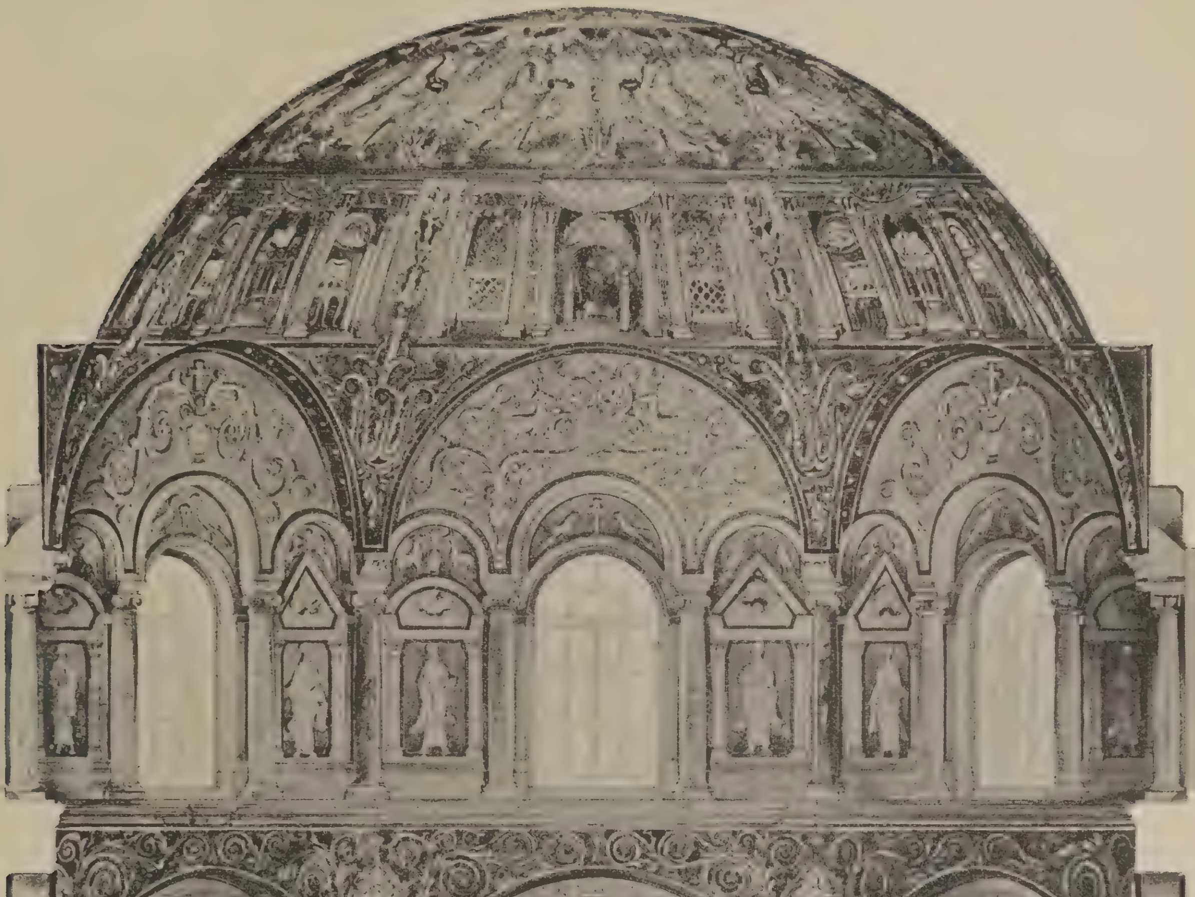




R.I.B.A. OWEN JONES STUDENTSHIP



The Baptistery at Ravenna: Transverse Section.

902. By Edward H. Bennett.

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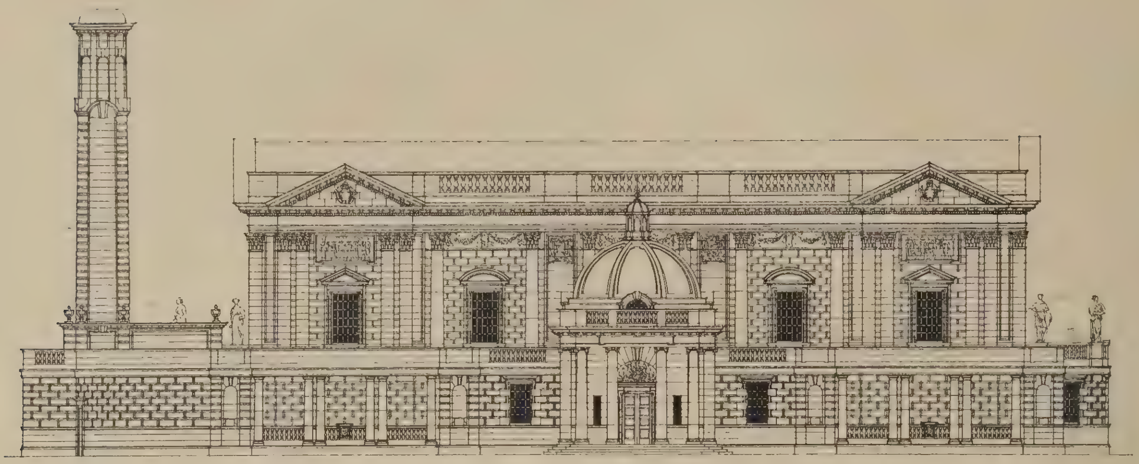
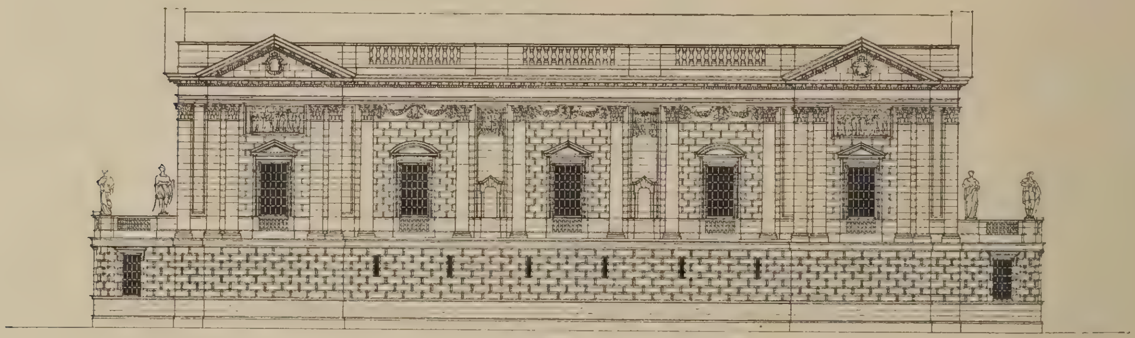
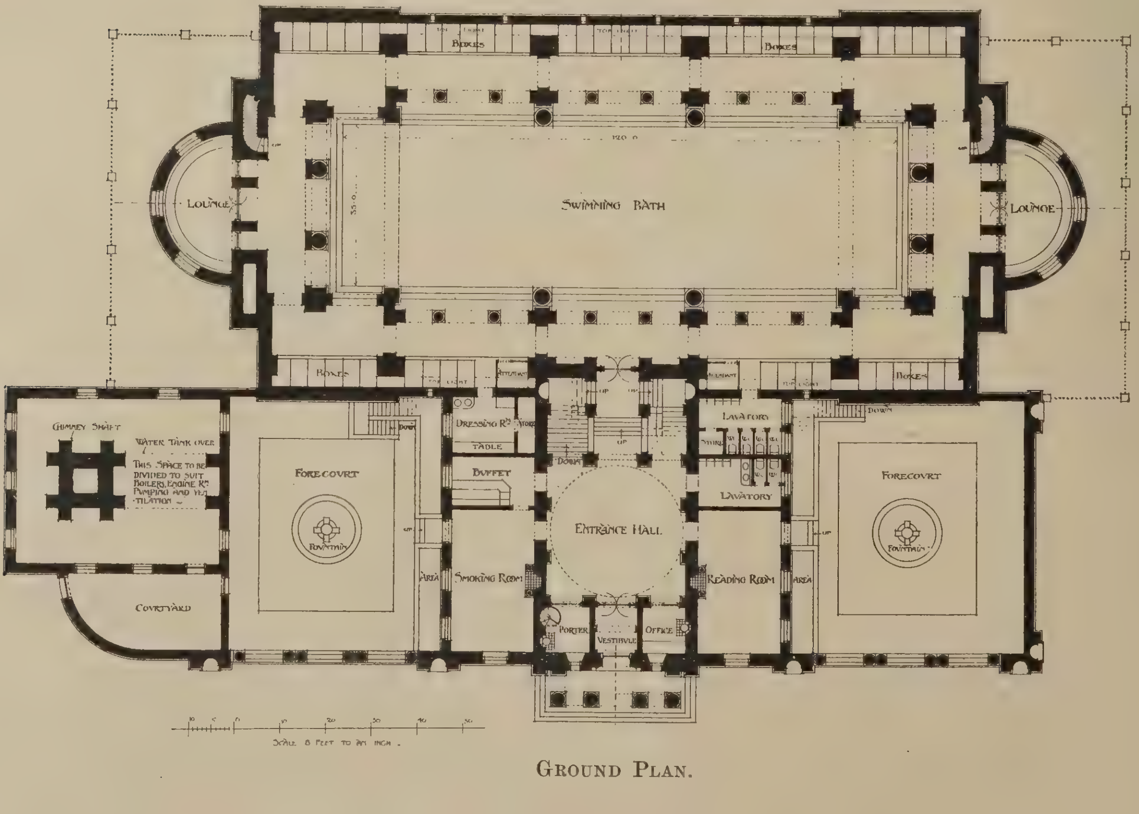


FRONT ELEVATION.

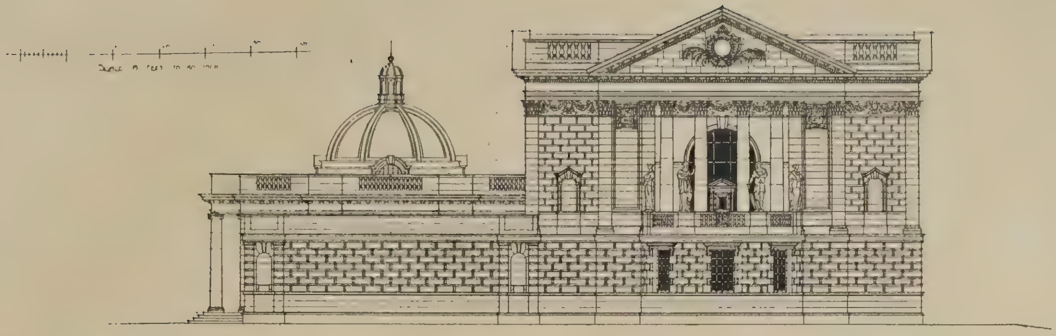


BACK ELEVATION.

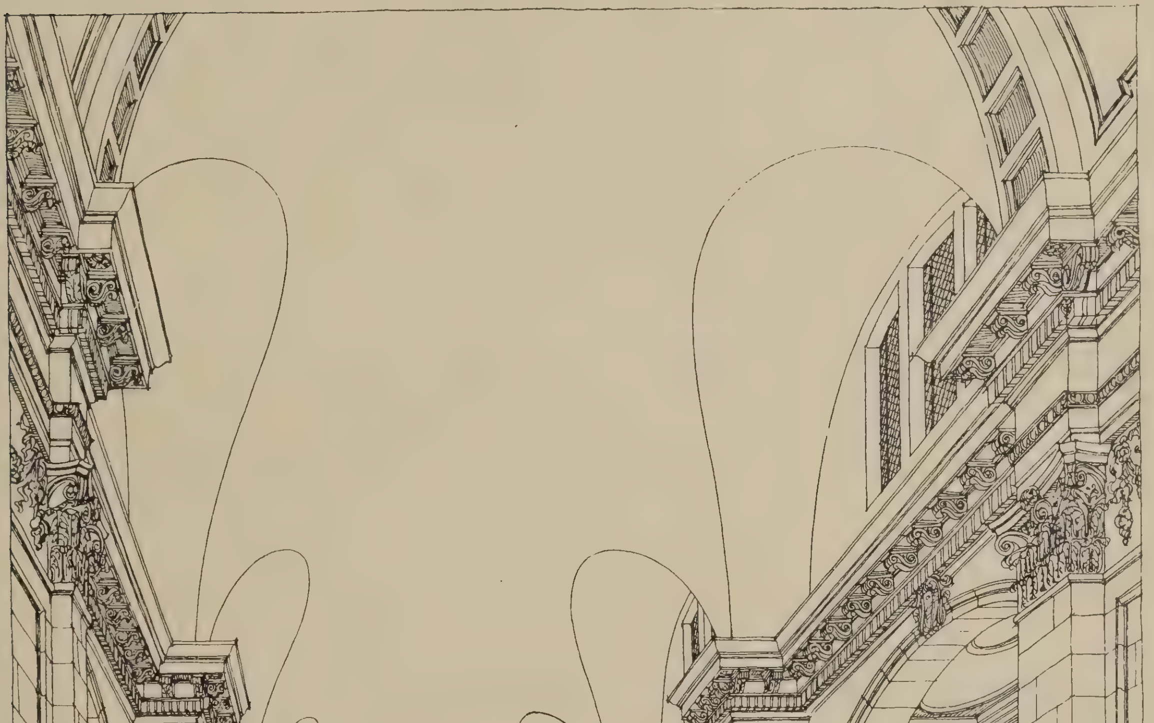


GROUND PLAN.

R.I.B.A. SOANE MEDALLION, 1902: DESIGN FOR A SWIMMING BATH



End Elevation.



Interior Perspective.

R MEN IN A SEASIDE TOWN. By T. A. Moodie ("Tepidarium"): Medal of Merit.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Dilapidated Walls between Gardens.

NEWCASTLE-UNDER-LYME.—F. S. writes: A. is the owner of a house with a long garden; nd she is also the owner of the wall separating er garden from that of her neighbour B. The all is much decayed, slopes over B.'s property a distance of 16½in. out of its vertical, and akes a considerable portion of B.'s garden osolutely dangerous for fear of the wall falling. . has served A. with two notices requesting her remove the danger, but A. pays no attention the notices. What is the best procedure for to adopt?"

You can sue B. for allowing the nuisance to ntinue, and probably obtain damages. This, owever, cannot make her remove it, but if she ntinues it you can keep on claiming damages. ou can also remove the nuisance yourself without constituting a trespass, provided you do not nnecessarily interfere with anything. If there a "Dangerous Structures" department of the l authority you should inform the surveyor, o would take steps to remove the danger and uld probably charge B. with the expense.

Liability for Broken Glass.

CARDIFF.—H. W. H. writes: "Z., a shopter, is requested by a customer X. to remove ent glass stall-plate from X.'s shop front for e purpose of re-lettering and gilding it. Z. t his man to do so, and the glass was taken out d brought back to the workshop. In placing glass upon the bench it broke, apparently by son of a flaw or small crack which had not n noticed when the glass was taken out. Is liable to replace the glass with new at his own t, or must X. bear the cost? No contract l been entered into."

Repairs are done at the owner's risk unless re is an agreement to the contrary. In this e Z. is clearly not liable and X. must bear cost.

Agreement not to Practise.

RADFORD.—SEAL writes: "Referring to the y in your issue for December 25th with rd to an agreement not to practise, supposing agreement were signed at a date during an agement as assistant, and contained the owing clause, 'and not to practise on our own ount at any time hereafter without written sent of employer'—would this clause affect ruling of an agreement as not binding in as stated in the reply referred to?"

he clause is a most reprehensible one, and ld not be binding. Every man is a free t, and none of his rights can be taken away pt by legal contract in which value passes.

Fonthill Abbey.

UTHPORT.—F. H. C. writes: "What is the nt condition of Fonthill Abbey?"

do not know Fonthill, but I gather from ay's "Wiltshire" that the great Palladian e and its successor the pseudo-abbey have disappeared, leaving nothing but an odd nent or so, in the shape of a hermit's cave o forth.

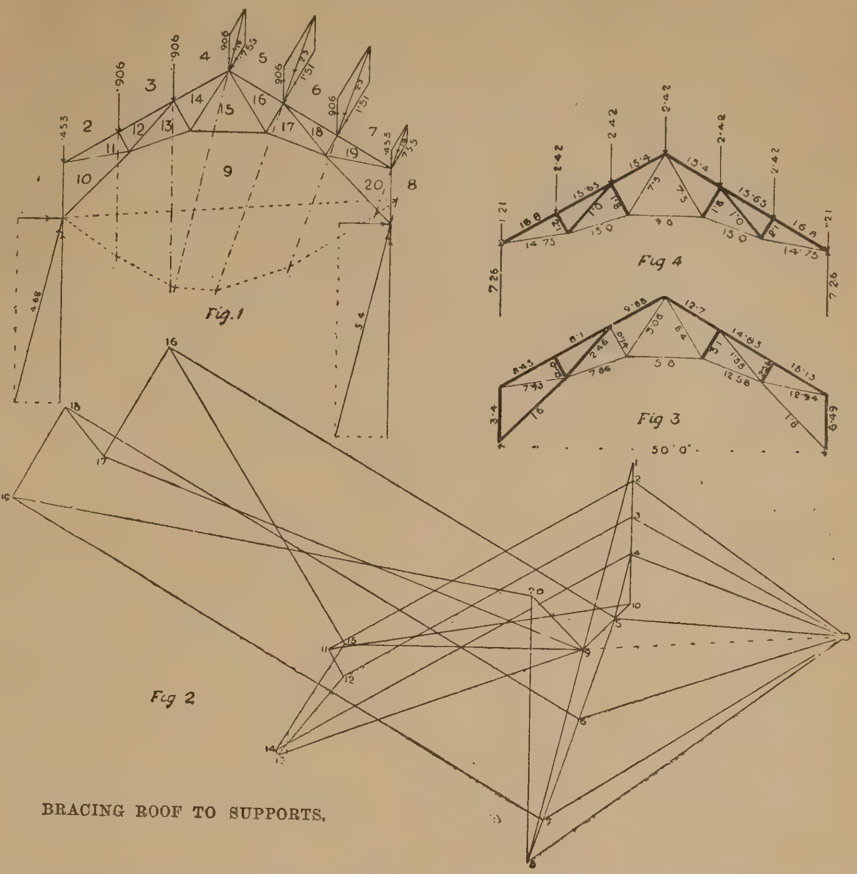
J. A. GOTCH.

Bracing Roof to Supports.

SCARD.—ENQUIRER writes: "Is it desirable t to introduce an angle tie as shown by d line on sketch (not reproduced) at foot rincipal? The structure is of galvanized nd the principals rest on rolled steel joists as stanchions. The roof is in an exposed on facing the sea."

he roof trusses are made exactly according tch they are very unsightly and would be ved by bracing to stanchions, but this would throw an additional stress upon them for which they were not designed. If the stanchions could be braced at the bottom the trusses would not be affected. Fig. 1 shows the frame diagram of roof truss with the suggested braces to stanchions. Fig. 2 the corresponding stress diagram, the trusses being assumed to be 10ft. apart and loaded all over with 21lbs. per ft. super. structural load, and on one side only with 35lbs. per ft. super. normal to surface for the wind-pressure. Fig. 3 shows the stresses in tons on the different members under these conditions, and of course if the wind blows from the other side the stresses will be reversed. Compression is shown by thick lines and tension by thin lines. Fig. 4 shows the original truss without the proposed bracing, and the stresses are those due to a vertical loading of ½ cwt. per ft. super. to cover all contingencies.

HENRY ADAMS.



BRACING ROOF TO SUPPORTS.

Vertical Tiling.

NEWPORT, MON.—A. L. R. writes: "Please give specification of necessary labours and full details showing the best method of finishing vertical tiling hung on fir laths 1in. by 2in., (1) at the eaves, (2) in gable, (3) under window sill. (4) How should a projecting casement frame be fixed to a brick wall? (5) Should the vertical joints between the frame and tiles be made water-tight; if so, which is the cheapest and most effective way? (6) Can you name any book showing details of half-timber construction?"

We cannot spare space in these columns to instruct you in the business of specification writing, &c., but you will find full information in "Specification, No. 5." Vertical tiling is usually hung on fir laths 1½in. by 1½in. Tiles 10½in. by 6½in. by ½in. are usually laid to gauges of 3in., 3½in. or 4in., or, in other words, a lap of 4½in., 3½in., or 2½in. Battens, however, are not the best things to use for vertical tiling, as they harbour vermin, and are sure to decay in time. If the tiles are nailed to the brickwork direct, the gauge is regulated by the thickness of the brickwork, being 3in. or 3¼in., or 4½in. if the bricks are laid on edge, giving a lap of only 1½in., which is not enough. It is therefore better to lay the bricks flat as usual with 1in. thick mortar joints, so as to make the gauge 4in. Another and better method is to nail the tiles to special-made breeze-concrete blocks measuring 1½in. by 9in. by 5⅛in., which jut out beyond the face of the wall so as to allow the nibs of the tiles to rest on them. These fixing blocks are used as stretchers, and you can easily work out for yourself the method of bonding the bricks in a 9in. wall. The nails should be copper or made of an alloy of copper and zinc; galvanized nails are considered by some persons to be best, but this is doubtful, being liable to corrode in time by galvanic action. (1) Fig. 1 shows the method of finishing at the eaves. If the eaves well overhang, as they should do, there is no need to finish the top course of tiles carefully; it is best, however, to push them into cement before nailing, as shown. (2) The same method is employed in the gables. (3) Fig. 2 shows the method of finishing under window sill by means of a strip of lead to keep out wet. This method is preferable to using cement, as the latter would show a somewhat objectionable finish. (4) If you will explain exactly what you mean by a "projecting" casement frame we will endeavour to answer your question. (5) There is no great necessity to make them water-tight, but the best method is to render with cement about 1in. thick and push the nibs of the tiles into it and then nail them. (6) Mitchell's "Advanced Building Construction" gives a few details. In our illustrations plain tiles nailed to battens are shown, but the methods of fixing are exactly similar in all cases.

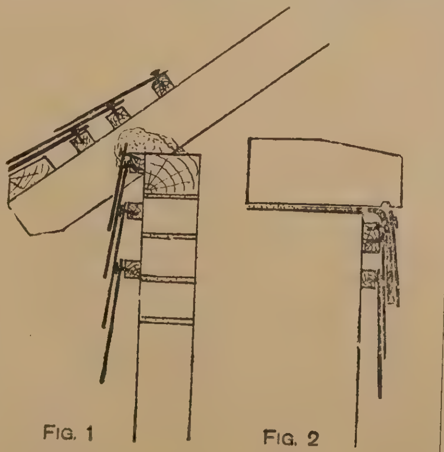


FIG. 1 FIG. 2

VERTICAL TILING.

Correspondence.

Army Works Reform.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The list of failures chronicled by "Balbus" may be amplified from past press notices.

Aden.—Quarters No. 19 R.A. Lines were twice condemned and vacated by troops, and subsequently turned into married quarters. The roof then falling in, floors admitting scorpions, rats, &c.; cesspools under windows, no ventilation—families preferred for the greater part of year to sleep outside on the sand.

Aldershot.—A refuse-destructor was erected at a cost of £3,000, and never used. Refuse is now removed under contract at a cost of £500 per annum. The lowest tender to work the destructor was £1,500.—Water supply is delivered by gravitation from neighbouring reservoirs. Pumping engines were erected; why, no one knows! The gasworks were abandoned and gasometers filled by the Aldershot Gas Company.—Surgeon-Major-General Patterson declined to occupy the P.M.O.'s quarters, deeming them unfit for habitation.— Zinc scandal: contractor's foreman was sentenced to eighteen months' hard labour, and the N.C.O. R.E. levanted.

Benares.—A new barracks was recently erected in a cantonment notorious for enteric fever.

Bermuda.—Stores scandal: military foreman of works was sentenced to six months' hard labour, subsequently reduced to three months on the ground of negligent supervision of the division officer. Meanwhile the office containing documentary evidence was burnt to the ground—on the second outburst, which occurred within a week of the first.—Works scandal: £6,000 unaccounted for; last news—officer under arrest pending enquiry.

Chatham.—Works scandal: contractor was sentenced to twelve months' hard labour and N.C.O. R.E. committed suicide.

Curragh.—Newbridge: 21st Lancers on arrival from the Soudan in 1900 were housed in dilapidated huts, twenty-eight men in sixteen-men rooms. Both cooking and hospital accommodation were insufficient.—Headquarters block: during Lord Roberts' occupation the drains had to be opened up and were found falling the wrong way.

Devizes.—A broad irrigation system of drainage existed, and a pure absorption one was substituted in a subsoil of stiff clay. Two months later the latter blocked up and the sewage forced its way to the surface into a ditch beyond, within 150yds. of the married quarters. The local authorities intervened.

Devonport.—An epidemic of diphtheria occurred and troops were removed. £10,000 were spent in remodelling drainage.—A vast sum of money was spent on land forts now lying derelict.—A slipway for mining launches was laid years ago and never used as the entrance through the boundary wall at the gun wharf was too narrow to admit boats of this type.

Dover.—An excess of £15,000 occurred in a battery owing to mistake in setting out.—The military prison, originally designed for convicts by Sir E. Du Cane, R.E., is surrounded by a wall consisting of external skins of half-brick encasing a filling of chalk. The rain filtered in, the chalk swelled, and a long length of wall fell down; it is now made good with concrete, but the rest is crumbling away.

Dublin.—The barracks are hotbeds of enteric fever. Five boards were summoned in one set of garrison orders to enquire into cases in five separate barracks. The late Duke of Clarence contracted fever in Marlborough Barracks, then recently erected. Cerebro-spinal-meningitis, due to very insanitary surroundings, is rife amongst children.—Lord Salisbury said, at the annual dinner of the Institution of Civil Engineers in 1895, in the presence of the then Inspector-General of Fortifications: "I hope some day the Civil Engineers, for the military engineers will not do it, will remove the reproach of typhoid fever from our barracks."

Edinburgh.—Piershill Barracks are bounded on the north by a cesspool; the married quarters are hovels; sanitary arrangements are exceedingly imperfect; the barrack-yard is riddled with sewer-pipes, and bounded on east and west by open sewers.

Gibraltar.—Four Spanish workmen were killed a year ago by the collapse of a magazine roof; the centering had been struck within fifteen hours of the completion of the work. Verdict of coroner's jury—error of judgment on part of Royal Engineers responsible.—Two more Spaniards were killed by the explosion of a mine at the Station Hospital a few months afterwards. The verdict was not published in this case. The old hospital was a disgrace to civilisation, and exposed to shell fire.

Kumasi.—Two Royal Engineer officers designed a fort a few years ago which was washed away by the first rains and is now replaced by a more substantial structure.

London.—Hounslow Barracks: the district council forced the War Office to remodel the drainage at a cost of £10,000. All troops, including hospital patients, had to turn out. The lower drainage was also set right after much bungling.—The South Kensington Museum sapper fire brigade was not long ago dispensed with, as it was more of a danger than a safeguard to the valuable collection concerned.

Longmoor.—The huts recently erected in a swamp are now condemned. £30,000 will be required for purchase of a new site, and this, with the removal of huts, will run into six figures.

Lucknow.—An epidemic of cholera occurred in barracks, which was due to a contaminated filter-bed.

Malta.—Pembroke Camp: the sanitation was so bad that troops had to turn out under canvas on to the parade ground during winter-time. Tents were blown away, bedding damped and kits damaged.

Portland.—No water was available in barracks for ablution purposes, and drinking water had to be carted three miles.

Rangoon.—The forts sank, became useless, and guns were removed, leaving the port practically defenceless.

St. Helena.—A site for new barracks was acquired at a cost of over £2,000 which had exchanged hands a few years before for £80. Typhoid fever raged. The walls of a new infantry barracks appeared a few inches above the ground, and the scheme was abandoned. Subsequently the walls of a gymnasium and married quarters block were carried up to the eaves, and also abandoned. A military prison is now being erected.—The married quarter R.G.A. are unfit for habitation, and men 6ft high find it difficult to move about in them. Troops who were under canvas from February to September last waited for tent bottoms, though timber and sappers abounded.

Salisbury.—The manœuvres of 1898 had to be partially abandoned at the last hour, as the engineers had not considered the water-supply. Portable steam engines were requisitioned to force water through hose to various sites. The price paid for ground acquired was 25 per cent. too high, *e.g.*, a proprietor was offered £600 which was refused, and matter referred to arbitration, with result that he was awarded £480. Taxpayers lost £20,000 over this deal!

Shorncliffe.—The new huts are failures, and cannot be kept warm; the old ones are preferable in this respect. The walls of a large span building not long erected were lately under repair, and had to be cross-tied to prevent collapse.

South Africa.—Portable huts were designed by civilians at Cape Town for troops at the front, and sent up to sappers for erection; the latter failed, and civilian tradesmen had to follow for the purpose. Certain firms were not allowed to tender for the supply of corrugated iron for these huts, yet the firm accepted was permitted to sub-contract with them for this material!

Windsor.—The barrack drainage was chaotic, with four types of unventilated drains meandering over the place and impossible to trace. The officers' mess became dangerous to live in. The Secretary of State for War when questioned, replied, "Other barracks are in a worse state and Windsor must wait its turn."

Woolwich.—Cambridge barracks: families of eight had to inhabit single rooms 16ft. by 13ft. 3in. by 10ft. Accommodation at Warley and Oxford was equally bad.

Surrey.—A correspondent lately wailed in press columns: "As at present doled out we shall have to wait some twelve years for the revised 1in., over forty years for the revised 6in., and 300 odd years for the new parish map." Many Ordnance sheets are forty years behindhand, so much so that whole tracts of country cannot be recognised on them. Stations, docks, &c., in existence for years are not yet entered. The other day a statement appeared in the press to the effect that the Royal Engineers were to be sent to the colonies to prepare military surveys for defensive purposes. Why did they not occupy themselves in this respect in the past? Had they done so, Buller would have been spared his humiliation at Colenso and possibly his subsequent disgrace.—Yours truly,

ARCANA.

Builders' Notes.

The Leyland Master Builders' Association held its annual meeting last week. The following officers were appointed: Mr. James Tomlinson, president; Mr. C. E. Marland, secretary; Mr. J. Tomlinson, junr., treasurer; Mr. F. Rose and Mr. T. Knowles, auditors.

Mr. G. F. Daniel, of Argyle Street, Swansea, has been chosen for the post of assistant building inspector at Salford out of 160 applicants. Mr. Daniel was teacher of the building department at the Swansea Intermediate and Technical School for two years, and is qualified by the Sanitary Institute to act as sanitary inspector.

The Newcastle-on-Tyne, Gateshead and District Master Plumbers' Association held its annual general meeting last week, when the following officers were elected: President, Mr. R. W. Cooke; vice-president, Mr. J. G. Walker; hon. treasurer, Mr. J. T. Corking; hon. secretary, Mr. George Robson; and hon. auditors, Messrs. J. Stewart and S. Percy.

London County Council.—At last week's meeting of the Council, in the report of the General Purposes Committee a letter was presented which had been received from Mr. W. Adams, resigning his post as manager of the Works Department. Mr. Adams said the post, under existing conditions, involved so much anxiety that he felt a continuance of the position could only result in the breakdown of his health. The resignation was accepted.—The Council approved estimates of £68,000 and £576,350 for the reconstruction for electrical traction of further portions of the Council's tramways on the south side of the Thames.

Two Fire Tests with Jarrah and Karri Floor and Doors were conducted last Wednesday at the testing-station of the British Fire Prevention Committee. The floor consisted of 10in. by 10in. beams over which 2½in. planks were laid and loaded with bricks exerting a pressure of 200lb. to the sq. ft. The test lasted two hours, the floor withstanding the flames remarkably well. The next test was with two doors 2in. thick, one made of well-seasoned Jarrah wood, the other of Karri wood comparatively new. After fifty minutes (during which time the temperature rose about 2,000 degs. Fahr.) the Karri door gave way, collapsing after another ten minutes; while in the case of the Jarrah door towards the close of the test (of one hour's duration) the flames just passed through in one small place. This also was considered highly satisfactory. Full particulars will be given in due course in the Committee's publications.

The Nottingham Master Builders' Association held its annual dinner last week. The chair was occupied by the president Mr. H. Vickers, and the vice-chair by the vice-president, Mr. F. H. Fish. Mr. James Wright proposed "The Mayor, Magistrates and Corporation," and the Mayor, Councillor E. N. Elborne, J.P., replied. Councillor J. Wright submitted the toast of "The Architects." Mr. A. W. Brewill, in response, said he was often sorry that they could not go back to the old times when the architect was the master-builder, and when he loved his work. Large buildings had to be rushed nowadays and it took a great deal of pleasure from the work. He sincerely wished that they had some system whereby all contracts were remunerative, the contractors receiving a fair price without running the risk of losing money through strikes and other unforeseen circumstances. He thought there had been a great improvement in the architecture of the buildings in the city during the last few years.

IDEAL PLUMBING.—I.

By G. A. ALLAN, Plumbing Instructor, Trades Training School.

IN this connection the word "ideal" is used strictly in its dictionary sense, namely, "reaching an imaginary model or standard of perfection." "Plumbing" is used as the Americans use the word, to include drains and hot-water supply. "Ideal plumbing" is such as one would carry out where perfection in plumbing was desired and expense was a minor consideration.

It by no means necessarily follows that because plumbing is expensive, therefore it is good. In one of the largest hotels in London the execution of the plumbing and drainage work is as near perfection as such work can be. But there are many tons of lead pipe and many hundredweights of plumber's solder and of brass in that hotel that the plumbing would have been much more sanitary without. Though the execution of the work was good, the design was faulty.

In reconstructing the sanitary arragements of a nobleman's house in London, a well-known firm laid three parallel drains from the rear to the front of the building. One drain was for sewage, one for rainwater and one for waste water. This was worse than wasting money; it was making an insanitary job; for one pipe would have been better than three, as it would have carried off all the drainage, and would have been three times as well flushed with one-third the liability to leak or get out of order.

Whether or not any thing, scheme or system is ideal is, ultimately, a matter of opinion. All English writers on plumbing and sanitation advocate the use of lead as the best possible material of which to make soil pipes, and they are equally unanimous in condemning iron as an unsuitable material. In America lead soil pipes are condemned as insanitary and unsafe, and cast-iron is considered an ideal material of which to make them. The Model By-laws issued by the Local Government Board recommend that all waste pipes discharge over a channel leading to a trapped gulley at least 18in. distant. In America waste pipes are connected with the soil pipe or drain in the same manner as water-closet apparatus. The by-laws of the London County Council forbid the construction of water-closet apartments so that the door shall open into any room used for the purpose of human habitation. In America it is not unusual to find a water-closet apparatus fixed in a recess in a bedroom, and only curtained off from the rest of the room.

In a recently-published book an English writer "at the risk of becoming wearisome" (to use his own words) repeats for the fifth time the necessity of disconnection from the drain of all waste pipes. Such a writer would not see a sanitary job of plumbing in the whole of the United States.

An ideal system of plumbing would provide water, hot or cold, at any place where it was required, quietly and effectively, and would remove foul water and waste matters in the same manner. Such a system would be practically silent and quite inodorous. All pipes would be absolutely sound. All drains and soil and waste pipes would have sufficient fall to cause the matters discharged into them to be carried off rapidly, and they would be continually traversed by currents of fresh air, which would carry off any noxious gases that might be formed in them. Plumbing fixtures must empty rapidly, and must be of the best shapes for their several purposes. All traps must be self-cleansing, and no foul water must remain on the premises after it has served the purpose for which it was used.

In reconstructing the drains of a building already erected it is necessary to ascertain the depth of the sewer below the level of the inlet to the drain furthest from the sewer, and the distance of such inlet from the sewer. The depth divided by the distance will give the available fall. If the difference of level be 3ft. and the distance 120ft., then $3 \div 120 = 1 \div 40 = \frac{1}{40}$, or 1 in 40. In making a drainage plan it is also necessary to be sure that the drain so arranged for will be deep enough to allow for the connection of fixtures between the sewer and the furthest inlet. If the available fall is less than 1 in 40, provision should be made for periodically flushing the drain.

The gradient at which drains should be laid is variously stated. It is often asserted that—

1 in 40 for a 4in. drain,
1 in 60 „ 6in. „
1 in 90 „ 9in. „

and so on, are suitable falls, and that this "decimal rule," as it is called, is easily remembered.

Like many statements containing a modicum of truth, this table is often misleading. It really means that where there is a sufficient flow of sewage to cause a 4in. pipe to run half full, a fall of 1 in 40 is sufficient. Similarly, when the quantity of sewage will keep a 6in. or 9in. pipe running half full then a fall of 1 in 60 or 1 in 90 is appropriate.

But I have heard this rule quoted by a man who wished to lay a 9in. pipe because the available fall was only 1 in 90, though the sewage was not more than a 4in. pipe would easily pass. In this case a 4in. pipe would be better than a 9in. pipe, because, even with a fall of 1 in 90, the 4in. pipe, by concentrating the flow, would keep cleaner.

A fall of 1 in 40 should be secured, if possible, throughout the whole drainage system. When houses or other buildings are designed this should be the fall calculated on. It is rather a reflection on an architect to design and superintend the erection of a building and then to request the sanitary authority to lower their sewer as the cellar is too deep to be drained!

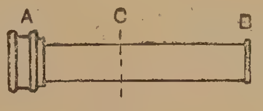


FIG. 1

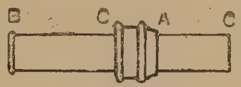


FIG. 2

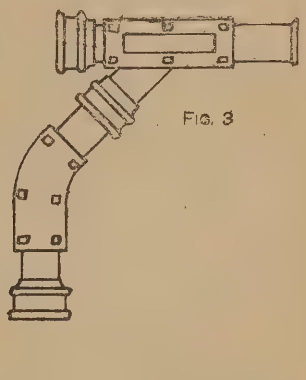


FIG. 3

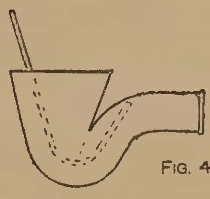


FIG. 4

When designing new buildings the fall of the drains is usually a matter under the control of the architect; but when reconstructing the drains of a building already erected the depth of the lowest floor, like the depth of the sewer, is already decided; and the best must be made of circumstances as they are found.

Until recently, vitrified stoneware pipes jointed with Portland cement were considered the best materials of which to construct drains; and when they are laid properly in straight lines, with true inverts, sound joints, and cleaned off inside, on thick concrete beds of proper width and covered with 6in. of good concrete, there is no doubt that they form a good drain. But cast-iron has now displaced stoneware as the material for drain pipes on all best work.

The very best material of which to form drains is undoubtedly heavy cast-iron glass-lined pipes of the same substance as used for water mains. They are stronger than stoneware, and therefore less liable to fracture, and the number of joints (and therefore chances of leakage) is very much reduced. They are jointed with gaskin and molten lead in the same manner as water mains in the street, and can therefore be laid to resist a much greater pressure than it will be possible to submit them to in practice. One very large mansion in London in which the available fall for the drain was very small was re-drained with glass-lined cast-iron pipes, a flushing cistern was fixed at the head of the drain, and the work gave every satisfaction. These pipes can be obtained in any length up to 12ft. by so ordering them, but as waiting for some exact length might cause delay it is necessary occasionally to cut them. Fearing the effect of the cutting on the glass lining, also the heat of the molten lead, and of the jarring caused by caulking the joint, I had a 3ft. length of 6in. pipe cut and jointed as shown in Figs. 1 and 2. The pipe A B was cut at C and the part C B was caulked into A, the cut end being inserted into the socket. The inside of the pipe at the joint could be seen and felt quite easily, and the glass-lining was quite unaffected, although the end inserted had been first cut and then had had the joint made round it. Of course the pipe must not be cut with hammer and chisel, but with ordinary pipe-cutters in the usual way.

The stock of fittings for such drains is so large and varied that no trouble is found in running the drain in any direction at any angle. All bends and junction-pieces should be fitted with inspection openings and movable doors; by this means the inside of the drain can be inspected from end to end. By holding a lighted candle at one opening and a small mirror at an angle at the next opening, the reflection of the inside of the drain can be seen without trouble. The outsides of the pipes are treated with Dr. Angus Smith's or similar solution.

Where the drains pass under the walls (and this applies to all drains), an arch should be turned over them at a distance of about 6in., or the wall over the opening should be supported by a stone or iron support.

In detached and semi-detached houses no drains should be laid under the building. In terrace-houses, and in houses built as in streets, it is generally necessary to lay the drain under the house from back to front. It is not always done, however. Lately, in a new house, on the drainage of which I was asked to report, I found the water-closets, bath and scullery sink all fixed against the front wall. The only drain under the house was one for surface-water, and it was disconnected by discharging through a side inlet into a gulley in the front area.

When the drain is laid under a house there should be no opening to it except in the open air. The only openings to the drain are those for ventilation and for connecting soil pipes, waste pipes from slop sinks and urinals, and grease-traps and gulleys. It would simplify matters if the waste pipes from slop sinks and urinals were called soil pipes. They must be of the same material and mode of construction as soil pipes, and I shall therefore include them under that head.

The soil pipes, gulleys and grease-traps should be in the open air, and where they are so fixed no opening to the drain is necessary inside or under the building. The drain should be laid on a bed of concrete at least 6in. thick and projecting beyond the pipe on each side to a distance at least equal to the external diameter of the pipe. The concrete should be made of good Portland cement 1 part and clean gravel 6 parts, or 1 of cement, 2 of sand, and 4 of broken brick or stone. Burnt clay should not be used, nor any substance too large to pass through a 2in. ring.

Right-angled junctions should never be used. When one drain joins another at an angle of 90 degs. a 45-deg. branch fitting and a 45-deg. bend should be used, both fittings having inspection doors (see Fig. 3). The covers to all inspection doors should be well bedded in red-lead putty (made by mixing dry red lead with white lead in oil) and hemp, and should be bolted down with gunmetal bolts or set-screws. Care must be taken that each time they are removed and replaced the drains are again subjected to the water test

In designing the sanitary system for a building it should be remembered that the fewer the fixtures the more sanitary the work. One water-closet used twelve times is much better than twelve water-closets used once. As many fixtures as are necessary for the convenience of the inmates should be provided, but no more. The number of gulleys should also be reduced to a minimum, and each gulley should do as much duty as can be arranged for. Gulleys fixed for draining off the surface-water should be provided with side inlets and rainwater and waste pipes connected to them. If possible. no gulley should be fixed either for surface-water or for rain-water which does not also receive the water from a waste pipe. In a period of drought, when drains are most foul for want of being flushed, and when the hot weather makes sewer gases more dangerous, surface and rain-water gulleys are liable to become unsealed by the evaporation of their contents. For this reason it is sometimes better, even when two waste pipes lead through the wall together, to have them discharging into different gulleys and so ensure the seal of both. Surface-water gulleys which do not receive the discharge of a waste pipe should have a very deep seal, not less than 6in.; it may with advantage be 1ft. As the gulley does not receive foul water, there is not the same necessity for it to be self-cleansing; and as it contains such a large body of water it will be less often unsealed by evaporation. If the gulleys receive, as they should, special and regular attention, those having deep seals will be as easily attended to as the self-cleansing variety.

THE SOUTHWARK END OF LONDON BRIDGE, 1831 ("LONDON AFTERNOONS").

The controversy over the question of intercepting traps between the main drain of a building and the sewer has been settled in London by the County Council issuing a set of by-laws which makes their use compulsory. Most places had already adopted the same attitude, which is supported by all English, and some American, writers.

The reason for using a trap on the main drain is to cut off the drain completely from the sewer, so that no sewer gas and no infectious matter passed into the sewer from other buildings shall gain access to the house drain. Thus the only noxious gases in the drain will be such as have been generated in the drain itself; and with properly laid and well-flushed drains this will be reduced to a minimum.

The objections to intercepting traps are that with properly laid, properly trapped (at the gulleys and fixtures), sound and well-ventilated drains they are unnecessary, as any bad gases in the drains escape above the roof. That the flow of sewage is checked by the trap, that the trap always contains a quantity of more or less foul matter, and that when the pressure in the sewers is suddenly increased the air and gases are forced through the traps into the house drains—are objections. The objectors point out that at one time it was the practice to disconnect soil pipes from drains and branch drains from the main drain, as well as the latter from the sewer; that for purposes of disconnection traps with two or three seals were invented; and that these traps are now useless. They expect the drain-intercepting trap to follow the soil-pipe disconnectors. It is pointed out that one great benefit derived from omitting the interceptor is that the sewers are all ventilated by the drain ventilators.

Drains intercepted from the sewer are freer from danger than when not intercepted, provided always that the drain between the sewer and the intercepting trap is ventilated. If this section of drain is unventilated, the sudden filling of the sewers, as by a storm, forces the traps: the sudden subsidence of the flow in the sewers draws air through the traps into the sewers, which may leave the traps unsealed. If the air in the sewer is particularly foul it passes through the water in the trap, being absorbed on the sewer side and given off on the house side of the trap.

Having laid the drain of cast-iron glass-lined pipe, at a fall of or exceeding 1 in 40, on a bed of concrete at least 6in. thick, with an intercepting trap near the boundary of the premises drained, with two openings for ventilation near the interceptor, one on each side, and one opening for ventilation at or near the highest part of the drain, and one opening at the further end of every long branch drain, it is necessary to test the drain for soundness.

The usual test is to close the lower end of the drain and to fill it with water. If the water subsides there is a leakage which must be found and stopped. If the water does not lose head the outside of the joints should still be examined for "sweating," *i.e.*, a slight leakage too small to show at the higher end for a long time. Before filling the drain a small piece of compo pipe should be passed through the gulleys to allow the escape of air that would otherwise be confined in the crown of their traps (Fig. 4).

In America the work of the plumber in a house is divided into "roughing in" and "finishing." The former process consists of fixing the drain and soil, waste and ventilation pipes—all the work which is covered up in process of building. Before it is covered up it is tested, either by being filled to the top of the soil pipe with water, or by having both ends stopped—generally with plaster-of-Paris—and air pumped in until the pressure-gauge registers 5lbs. or 10lbs. to the sq. in. The latter is the more satisfactory as well as the more severe test. It can be applied to the largest system or the highest building without having an excessive pressure anywhere, as happens when a long vertical pipe is filled with water. The pressure is great enough to find all the weak places without being so great as to burst anything. It is easily applied, and leaks are readily found either by sound or, when too small for that, by going over the joints with soapy water, when the escaping air will blow soap bubbles, and so indicate the position of the leak.

(*To be continued.*)

Views & Reviews.

Old London.*

It is not probable that our descendants will look back on the London of to-day in the same way as we regard the London of four or five centuries ago: though one might even hazard the reflection that machine work will become so universal in the future that even those of our own productions which are now considered to be unsatisfactory may come to be regarded with the admiration attaching to a work of art. Romance always tends to associate itself with the past and rarely with the present; it often makes things appear different to what they really were, and this is the reason why people frequently adopt the attitude of unrestrained admiration in regard to the buildings, handiwork or domestic articles of the Middle Ages; not that they are wrong in doing so, but such a sentimental judgment is neither true to the past nor to the present, and it needs to be watched ere it run rife.

Doubtless it is the comparison with things as they are to-day which makes the London of the Middle Ages so fascinating: the changes since those bygone days are so strange and so completely overwhelming. Mr. Loftie, for example, takes his readers for a walk through the London of five centuries ago. Most people then lived in the City proper, and merchants did not resort to it only for business purposes and retire to villas in the suburbs, for few except the monks and the day-labourers dared to live beyond the protection of the city walls, which commenced at the Tower (so admirably and comprehensively dealt with in Lord Gower's book).

Outside Aldgate there was a hamlet called Whitechapel and near it a house of Sisters who were popularly known as Minoresses (hence Minories). Shoreditch was the estate of an honourable family named Shore; while Finsbury probably denotes the residence of Fin, maybe a Dutch settler like his neighbour Hacon, who is commemorated in Hacon's ey, or Hackney. Cripplegate had nothing to do with cripples but with a covered way, or Crepulgeat; and Ludgate had no associations with King Lud, but recalled a lidgate or postern. However, let us pass through this latter gate and on to the small bridge over the Fleet. There are pleasant orchards of the Bishop of Ely (Ely Place) on the right; and if we pass along where Fleet Street now is we shall see the house of the White Friars on the left, then, further up, the great monastery of the Knights Templars, and further west again Temple Bar: beyond which is open country with a road (now the Strand) winding through it, a mere muddy track overgrown with bushes and skirted on the right by gardens and thickets. On the left, between the road and the river, are some half-fortified town houses of the bishops, Exeter House being the most important; while below them are walks along the Thames like those now seen at

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* "London Afternoons," by W. J. Loftie, B.A., F.S.A. London: Cassell & Co., Ltd., price 10s 6d. nett.

"The Tower of London," Vol. 1 (in two volumes), by Lord Ronald Sutherland Gower, F.S.A. London: George Bell & Sons, York Street, Covent Garden, price 21s. nett.

"The Portfolio: Mediæval London," by Canon Benham, D.D., F.S.A., and Charles Welch, F.S.A. (with numerous collotype reproductions of old drawings). London: Seeley & Co., Ltd., 38, Great Russell Street, price 5s. nett.

Richmond. Further afield we see the magnificent palace of the Archbishops of York (afterwards known as Whitehall and its gardens as Spring Gardens), the aviary or mews for the King's hawks (where now stands the Nelson Column), the Convent of Westminster, the church of St. Giles-in-the-Fields, and so to the Oxford Road, near the pleasant village of Holborn.

And thus one proceeds among parts which are now so altered. It would occupy too much space to deal with a tithe of the matter which Mr. Loftie presents in such an interesting and authoritative manner; of his description of old St. Paul's with its wooden spire 150ft. higher than Wren's ball and cross; of the City companies and the guilds; of the older City churches; of the present St. Paul's; and of the London of a century ago. There is, however, one concluding remark which should be made in reference to the accompanying illustration of Alfred Stevens's monument to Wellington (which, with those of old London Bridge and old Westminster Bridge, we are enabled to reproduce through the courtesy of Messrs. Cassell & Co.). Alfred Stevens was undoubtedly the greatest sculptor we have yet produced; yet this great work of his was most wretchedly dealt with. It had been designed for the easternmost arch on the north side of the cathedral, but before it was removed to its present position ten years ago (through the exertions of the late Lord Leighton and some friends) the Dean and Chapter had actually allowed it to remain for about twenty years behind the oaken screen in the consistorial church and against the light of a south window; and even now it is incomplete, as the top is without the equestrian statue which Stevens designed for it.

WESTMINSTER BRIDGE, HALL AND ABBEY 100 YEARS AGO ("LONDON AFTERNOONS").

ALFRED STEVENS'S MODEL OF THE WELLINGTON MONUMENT ("LONDON AFTERNOONS").

Fletcher's History of Architecture.

The fourth edition of this work is undoubtedly superior to the former ones, having been almost rewritten by the junior author. In the process it has been considerably enlarged and the price unfortunately increased. This is regrettable from the fact that a book is needed for the younger students, craftsmen, and for all interested in building, and such a price as twenty-one shillings does not appeal to those to whom it is most likely to be of use. From the demand which Fletcher's "History" has met with, the need of a good book can be appreciated. This present edition is illustrated by a very large number of half-tone blocks, by no means so good as the collotype prints of previous editions, but remarkably good of their kind and well suited to their purpose; and we are compelled to the conclusion that the chief value of the book lies in these illustrations. Mr. Banister F. Fletcher has improved the book considerably by basing his analysis of the styles mainly upon construction, from which the forms spring.

In considering the work we must bear in mind what are the aims of a history of architecture. First and foremost we undoubtedly require the facts. Then these should be co-ordinated in order to show their due relation to the result, and as the view of their relation depends upon a true perception of their importance, and furthermore as we need to judge the scale or value of these results, the principles laid down by the author must be true, as they will colour his theories throughout. The older histories were chiefly concerned in the collection of facts, and are invaluable in this respect. Viollet-le-Duc did somewhat as Darwin did in collecting abundant evidence upon particular species, drawing conclusions from them sufficient to give a workable theory, which has been enlarged by patient workers bringing fresh facts to be judged by the evolutionary theory and from an enlargement of view due to the development of science in general. For some time architectural historians were busy collecting facts with some little and incomplete attempts at co-ordinating them. Of recent years we have been improving in this respect, several very able contributions to the history of particular epochs having been made by various writers; but there is a want of a critical essay summarizing the facts that have been collected and arranging them in orderly evolution. Mr. Banister F. Fletcher accepts the evolutionary theory, which no one qualified to judge now doubts, as may be judged from statements throughout the book and the very plan of the work, *i.e.*, the comparative method. Unfortunately his use of the "comparative method" is so mechanical that the due relation of the detailed facts is lost by separation under various headings, which make each division appear of equal value. This fault would have been somewhat retrieved if the general introduction had been more complete and wide in its grasp—an essay in itself—and if afterwards at the end of each chapter there had been a somewhat similar summarizing. At present the want of grasp makes the book of little real value as an incentive to and basis for further study, or, what is of greater moment, to give a student the true principles of architecture, educating him to better our future architecture. The adoption of divisional headings has led to a great deal of useless verbiage where there was a want of material. The language too is often high flown and not as simple as the subject warrants. Fine writing we can pardon in such as Ruskin, where it serves a legitimate purpose and is thoughtful, but where introduced only for the sake of effect it blurs a clear perception.

The book does not contain enough details of construction to show the reason of the architectural forms. The details of ornament, on the other hand, although none too many, are out of proportion to their legitimate place. These illustrations are lettered in the style familiar in students' competitions, making the wording hard and wearisome to disentangle and destructive of clearness in the thing represented.

In reference to what we are pleased to call the "Classic" and "Gothic," we have the usual statement that the one is of the "beam" order and the other of the "arch," and that the pointed arch is the keynote of the latter, a statement that appears excellent to a student at first sight, but is really beside the mark. Of course such views are elaborated with glib statements as to "Gothic" being the "intense expression of its age" and "the keen artistic refinement of the Greeks," such as students use in examination papers without apprehending their true meaning. The chapter on Prehistoric Architecture which has been added is most meagre, although it afforded an excellent chance of introducing the beginnings and then working on to the more complex forms of later civilizations. In the Egyptian chapter the general questions of the influence of geography, geology, climate, &c., on architecture are first dealt with instead of in the introduction, as should be. The accounts of the religions of various countries are generally wrong, that of Egypt in particular. This chapter and that of Assyria are very weak, and many of the facts stated are incorrect. We are glad to see that a section has been added on the "non-historical" styles of India, China, Japan and Central America, this term being unfortunately used to signify that they exercised little direct influence on other styles, but Mr. Fletcher little apprehends the intimacy that came from the great trade routes between Europe and further Asia, and the influence of India and China on Assyria was considerable and through the latter affected Greece, as we know. The finest timber architecture in the world—that of Japan—is very meagrely dealt with. It is to be regretted that no good detailed account of this has been published, as it would be of inestimable benefit to modern construction.

One very important element in a history has been generally omitted in describing the examples of each style, namely, the particular uses of the buildings, for only from an apprehension of these can a student understand the reason of a building having its particular form. This is as necessary as the other functions dealt with by which the architectural form is determined. The book needs considerable revision before it can be relied upon for its facts; and, as we have said, its conclusions will give a student a very imperfect notion of the evolution of architecture.

"A History of Architecture on the Comparative Method for the Student, Craftsmen and Amateur." By the late Prof. Banister Fletcher, F.R.I.B.A., and Banister F. Fletcher, A.R.I.B.A. Fourth Edition, revised and enlarged. London: B. T. Batsford, 94, High Holborn, W.C.; price 21s. nett.

R. I. B. A.

ADDRESS TO STUDENTS.

BY JOHN SLATER, B.A.

A MEETING of the Royal Institute of British Architects was held last Monday evening. Mr. John Slater, vice-president, was in the chair. Mr. W. J. Locke, secretary, announced the decease of Mr. W. G. Penty, F.R.I.B.A. Mr. Slater then announced that the Council had decided to submit as a fit recipient of the Royal Gold Medal for this year the name of Mr. J. F. Bentley, architect of the Roman Catholic Cathedral at Westminster, for his work as an architect.

The following were then elected members:—As *Fellows*, Messrs. John Parker (Cape Town), Andrew N. Prentice (London), John Robert Moore-Smith (London) and F. Henry Tulloch (Belfast). As *Associates*, Messrs. Charles Thomas Adshead (Liverpool), Sidney Walter Bensted (London), Ernest George Besant (Cambridge), Austin Barugh Botterill (London), Charles Alfred Broadhead (Nottingham), Dean John Brundrit (Ulverston) Harold Busbridge (London), Ralph Scott Cockrill (Great Yarmouth), William John Devlin (London), Walter Ernest Dobson (London), James Ewing (London), Edward Lawrence Gaunt (Bradford), Arthur Everett Gibbins (London), Francis Robert Boyd Haward (London), Ralph Eustace Hemingway (Nottingham), Augustus Edward Hughes (London), Allen Trevis Hussell (Ilfracombe), Ernest William Lees (London), Edward Berks Norris (Birmingham), Leonard Rycroft Oakes (London), Harold Frederic Pondon (London), Cyril Edward Power (London), William Beddoe Rees (Cardiff), Charles Herbert Reilly (London), Ernest George Rodway (Bristol), Andrew Sharp (Montreal), George Lister Thornton Sharp (London), William Slater (Nottingham), Francis Danby Smith (London), Walter Stephen Tucker (Newmarket), Arthur Halcrow Verstage (Godalming), Edwin Paul Wheeler (London), Joseph Alfred Woore (Derby) and Edmund Livingstone Wratten (Croydon).

Mr. John Slater then read an address to students in which he said:—The architectural student of to-day, if he takes an intelligent interest in the history of his art, must be much impressed and somewhat puzzled to notice how very fluctuating and short-lived have been the various fashions of architectural taste during the last hundred years or so. If he looks to ancient times, when the world was young and what Lord Leighton calls "the spirit of spontaneous, unquestioning joy in production" was paramount, this was not the case. The styles of architecture which the early building peoples evolved for themselves to suit the vicissitudes of climate, the varying necessities of their public and private life, the nature of the building materials found in the country, and various other local conditions, persisted with slight variations for centuries, and only died with the decay of the nations themselves. Since the renaissance of classic taste all has been changed.

In 1827 was published a work illustrating the recent buildings erected in Regent Street and on the outskirts of Regent's Park, and speaking in terms of no unstinted praise of the excellence of the designs. Yet in 1836, when the Houses of Parliament were in course of erection, we find the Gothic style to the fore. In 1867 every one of the competitive designs for the new Law Courts was in the Gothic style. A generation later what do we find? You are all acquainted with the storm which was raised a few weeks ago anent the Liverpool Cathedral competition, and I need not quote the opinion of a distinguished modern architect as to the competency of the Gothic style to meet the requirements of to-day! Now I think it very probable that all this may lead an architectural student to exclaim: "A plague on both your houses! Why should I bother my head with learning anything about Classic or Gothic, Romanesque or Renaissance? All art is ephemeral; utilitarianism is the only guide. These styles are now all dead, and will give me no help towards designing a town-hall, an infirmary or a modern residence." Now I do not think it can be too strongly impressed on those who may be disposed to hold such views that they will be utterly wrong if they take this line. What is it that stirs the emotion even of the unlettered man when he gazes down a vista of columns, gigantic and awe-inspiring, in an old Egyptian temple, or looks upon the perfect grace of the Parthenon or the stupendous relics of mighty Rome, or when in some old mediæval cathedral he looks up to the springing arches and intricate ribbed vaulting, but the feeling that, different as may be the forms which present themselves, there is such fitness in the purposes of each and in the connections of all the parts with each other, such perfection in the combination of form and colour, that the nett result in every case is beauty. The buildings which have attracted and which will attract the most universal admiration are not those at the sight of which we exclaim "How enormous" or "How wonderfully clever," but those which are beautiful. I am old-fashioned enough to think that an architect ought to try to make his building beautiful, and that a protest should be made against what appears to me to be the cult of ugliness which has been growing of late years. There is too great a tendency nowadays to mere eccentricity and originality among the younger men. There have been several buildings erected lately the cleverness—I had almost said the infernal cleverness—of which cannot be denied for one moment; but are they beautiful? There is far too much straining after effect, too great eagerness to achieve something not attempted, or at any rate not achieved, before; and, as has been well said, "when the achievement becomes obvious, is it not by way of becoming uninteresting?" I am not arguing in favour of a dead level of monotony which is uninteresting, even if the level be a high one; I have no love for the stereotyped style of art which the Continental methods of education and study too often result in. If a man be a true artist his individual emotions, the bent of his mind, all the idiosyncrasies of his character, are bound to come out in his work; but do not let your main idea and aim be to display your idiosyncrasies.

A real genius may be original because he has the knowledge and the power to work out his original ideas; but what can be more contemptible than to see the weak, jejune and spiritless attempts to copy what may be admired as an original work of genius, while the copy only shows the lack of genius in its exponent? Your buildings are the vernacular in which you have to express the architectural ideas which are in you, and, depend upon it, the simpler and more direct that language is, the more eloquently will it appeal to the world. Be assured, therefore, that the time you may spend in studying old work will never be wasted; such study will fit you better to soar into the heights which science is opening out. And, further, the study of old work will teach you another most important lesson—never to lose sight of the nature of the material in which you are working. In the best old work the material is never tortured; one form of ornamentation and enrichment is suitable for stone, another for brick, and another for wood; and this has always been lost sight of when art became debased, with a result that a mere *tour de force* is attained from which, however much we may admire the skill which produced it, we turn with relief to the simpler, truer and more legitimate methods of treatment.

Let me urge you to cultivate an easy, terse and direct literary style. When you get into practice you will have to write reports and to carry on daily correspondence on all sorts of subjects, and you should endeavour always to make your own meaning as clear as possible to those you are addressing. It often occurs to me how lamentably deficient in literary style are the majority of architects' letters.

The field of an architect's practice is ever widening, and in fact it is now so extensive as almost to deter men from entering on it. All the new discoveries of science, which at first are simply laboratory experiments, are gradually made to subserve our daily needs and requirements, and as soon as this has taken place our clients expect us to advise them with reference to all new inventions, and you will find it to your great advantage to keep *au courant* with the times by noting and, if possible, investigating the utility of new inventions affecting architecture. But the powers of any individual are limited, and I feel sure that the near future will see a good deal of devolution of the manifold duties undertaken by architects. And I see no reason why this should turn out to the detriment of the architect. On the art side he can be associated with the sculptor, the painter and the mosaic worker, and on the scientific side why not with the engineer? Quite recently this Institute urged the desirability of associating an architect with an engineer in bridge design, and I am confident it would often be desirable to associate a professional civil engineer with an architect in the case of large buildings where difficult problems of support or construction have to be considered, the best arrangement of electric wiring, and so forth. The very wideness of the field covered by an architect's practice, with all its manifold responsibilities, has, however, its compensations. As your practice increases you need never be haunted by the dread of monotony. Your work will probably take you afield into various parts of the country, and every fresh building which you have to design will present new difficulties as to site, aspect and accommodation, &c., which it is a never-ending pleasure to try to overcome. Architecture is so many-faceted and touches so many planes of modern life—ecclesiastical, municipal, commercial and social—that an architect ought above all other men to be broad-minded and to avoid anything like cliqueism or a haughty bearing towards his fellows. Remember that, however fascinating and lofty may be your designs, the effect of your buildings when finished depends not upon yourself but upon the builder who carries out your designs, the foreman who looks after the work, and even the individual carpenter who fits a moulding or the labourer who mixes the concrete.

Mr. Henry T. Hare then criticized the designs and drawings submitted for the prizes and studentships. He thought the high level of previous years had been well maintained and that some of the work was in advance. The prizes were then presented by the chairman.

A vote of thanks, proposed by Sir Alma Tadema R.A., and seconded by Mr. John James Burnet, president of the Glasgow Institute of Architects, was accorded Mr. Slater and Mr. Hare.

Keystones.

The Year-Book of the Society of Architects has just been issued.

Mr. J. F. Bentley, architect of the new Roman Catholic Cathedral at Westminster, entered upon his sixty-third year last Thursday.

Mr. Henry Hugh Dyer, architect and surveyor, of Northampton, died recently in his seventy-second year. He erected a great number of churches and chapels in the neighbourhood.

A Monument at Dakar is to be erected in honour of the traveller and explorer, Paul Blanchet. It takes the form of a stela of granite bearing a medallion portrait by M. Henri Dubois.

The Competition for a Monument to Bismarck has been decided, and the prize of 10,000 marks awarded to Hugo Lederer, an Austrian sculptor, pupil of Professor Schilling, of Berlin. The other three prizes went to Munich, Charlottenburg and Berlin. The monument of the "Iron Chancellor" will be erected at Hamburg.

Kingston-on-Thames Public Library Competition.—Mr. Maurice B. Adams, Mr. E. Milner Allen, Messrs. Carter and Ashworth, Mr. J. A. Cox, Mr. A. J. Hardwick, Messrs. Hennell and Sons, Mr. S. B. Russell and Mr. Sidney R. J. Smith have been invited to submit designs in this limited competition. Mr. Basil Champneys is the assessor.

A Church Hall and Cloisters at Liverpool have been erected as a memorial to the Rev. John Brunner and Sir Henry Tate by Sir John Brunner and Mr. Henry Tate, to complete the scheme of buildings of Ullet Road Unitarian Church. The architects were Messrs. Thomas Worthington and Percy Scott Worthington, of Manchester. A fresco painting has been executed by Mr. Gerald Moira, professor at the South Kensington School of Art.

A Chancel Screen of carved oak has been erected in the Church of St. Matthias, Earl's Court, in memory of the late vicar, the Rev. J. P. F. Davidson. It is unusually lofty and open, and every effort has been made to preserve an uninterrupted view of the sanctuary and east window. The central arch is surmounted by a rood. The chancel of St. Matthias, which was erected some years before the nave, was separated from the latter by a low stone wall and gates, which remain, and it was always understood that the architect's original conception provided for a lofty screen.

Three Towns Architects' Annual Dinner.—The annual dinner of the Plymouth, Devon and Stonehouse branch of the Devon and Exeter Architectural Society was recently held at Plymouth. The chairman, Mr. Charles King, F.R.I.B.A., in proposing the toast of "The Royal Institute of British Architects and Kindred Societies," said that while they all looked up to the Royal Institute as an ancient and honoured institution, he heartily wished and hoped that it would become less conservative than it had been in the past, and that it would awake and show a little more life and interest in the work which it had to do. If the whole of the provinces would unite and make a strong appeal to and demand upon the Institute, perhaps it would awake and rise to a new effort in aid of architecture.

Finsbury Circus Garden.—This latest addition to the open spaces of the City has been opened to the public. The Metropolitan Drinking Fountain and Cattle Association have given two drinking fountains. A plain granite one has already been fixed, while on the side near to the London Institution a fountain built of open-timber work in English oak, and covered with a conical roof of ornamental red tiles surmounted by a bronze finial, is to be erected. In plan it is circular, having six divisions, three of which are entrances, the remaining sides being filled in with timber struts and cement rough-cast. The whole is raised on two grey granite steps. The actual drinking fountain is circular, and is to be of polished red granite and placed in the centre. There are three lion-head water jets, one opposite each of the entrances. The width is 6ft. 6in., and the total height 17ft. Both have been designed and made by Messrs. John Whitehead & Sons, Ltd., of 74, Rochester Row, Westminster.

Selby Abbey Church Tower is considered to be unsafe and steps are to be taken for its reparation.

Spillman Court, a historic mansion near Stroud, Gloucestershire, was completely destroyed by fire last week. For some years past the place had been unoccupied. Among the things destroyed with the building are a number of handsome oak mantelpieces and artistic panellings.

A Stained-Glass Figure of Queen Victoria has been placed in the west window of Oswaldkirk Church by the villagers, as a memorial of Her late Majesty. It is the work of Messrs. Burlison & Grylls, executed under the direction of Mr. Hodgson Fowler, F.S.A.

New Public Offices at Felling are being erected on Sunderland Road. They will be entirely of stone, the walls being faced with coursed rock-faced blocks, and the dressings will be moulded and polished. The style is Italian Renaissance. The cost of the building without the site will be about £7,000. The contractor is Mr. John Wilkinson, and the architect Mr. H. Miller, A.M.I.C.E., both of Felling.

A New Council House and Public Offices at Sparkhill, for the Yardley Rural District Council, have been opened at a cost of, including site and equipment, £16,000. The building is in modern Renaissance style, with the introduction of a slight Tudor feeling, and it is of brick, with stone dressings, stone mullion windows, stone cornices, and Cotswold stone tiled roof. Mr. A. Harrison is the architect, and Mr. W. Bishop the builder.

A New Wesleyan Chapel at Osmaston-by-Derby has been erected in Gothic style. The total seating capacity is about 433 adults or a mixed congregation of 560 persons. The walls are of brick, with Derbyshire stone dressings. The total cost of the building including the cost of the land, architect's fees, &c., is about £3,000 The architect is Mr. John Wills, F.S.Sc., of Derby and London; and Mr. William Edwards, of Derby, is the builder.

Books dealing with Capitals.—Referring to the enquiry which appeared recently in our columns, a correspondent points out that although there is no book dealing solely with capitals, the following works contain much information about them and many illustrations of various important examples:—"Matériaux et Documents D'Architecture et de Sculpture," by A. Raguenet (André, Daly Fils & Cie, publishers, Paris); "Le Musée de Sculpture Comparée du Palais du Trocadéro," 2 vols. (published by Armand Guérinet, editeur des Musées Nationaux, Paris); "Examples of English Mediæval Foliage," James Kellaway Tolling, F.R.I.B.A. (published by B. T. Batsford, 1874); "Art Foliage for Sculpture and Decoration," by the same author (published by himself in London, 1865); "The Churches of the Nene Valley, Northamptonshire," by E. Sharpe, J. Johnson and A. E. Kersey (B. T. Batsford, 1880); "Southwell Cathedral: Principal Capitals and Carvings in the Chapter House" (J. Whittingham, bookseller, Southwell, Notts, price 1s. 1½d. post free).

Stuart's Granolitic Stone Co., forced by their increasing business and the numerous contracts now on hand, have been compelled to remove from their old premises at Limehouse to a much larger manufactory at Glengall Road, Millwall. On Wednesday evening last, by invitation of the managing director, a housewarming party was held in the new premises. The guests (both ladies and gentlemen), about 100 in number, and all wearing rosettes of Stuart tartan, had an excellent dinner served to the strains of the bagpipes. The toast of "The Firm and Staff" was proposed by Mr. William Walter, and responded to by the company's secretary, Mr. Napier Trollope. Mr. P. Stuart, the managing director, also complimented the members of the staff and referred to the lengthy periods of service of most of them. He also proposed the toast of "The Visitors" in one of his characteristic speeches. This was replied to by Mr. Harry Hooper, who in welcoming the company to the district favourably contrasted the Millwall of to-day with the "Isle of Dogs" of a hundred years ago. The chairman's health was proposed by Mr. W. Clarkson, the architect of the new building. An impromptu programme of songs and recitations and a few dances filled up a most enjoyable evening.

Liverpool Cathedral Site.—The Liverpool Cathedral Committee has just issued in pamphlet form a "Statement of the Arguments" in favour of the adopted site, St. James's Mount. These arguments, however, are now threadbare.

The Barrow Master-Builders' Association held its annual dinner last week. Alderman W. Gradwell, the retiring president, occupied the chair, and Mr. W. Ramsay, the president-elect, the vice-chair.

A New Church at Frimley, Surrey, is being erected to take the place of the chapel-of-ease. The west end and nave only are to be erected at present, at a cost of about £2,000. It will accommodate 500 persons.

The New Imperial Hall, Dulwich, has been opened. It is capable of seating 700 persons. Two smaller halls—to be used as smoking and refreshment lounges—are in direct communication with the main hall.

Rodin is making a bust of Victor Hugo which will be reproduced in bronze. The striking mask of the poet in the Panthéon served as model. Destined for the Musée Hugo, there will be placed alongside it a replica of David d'Angers's bust of the author of "Chosen Vues."

At Hoo All Hallows Church, Rochester, during the recent restoration two fine arches—one fourteenth century and the other earlier—have been discovered. A consecration cross in a good state of preservation was also uncovered. The church, which dates from the Norman Conquest, and its ancient early Norman font and fifteenth-century oak pews and chancel screen, have been carefully preserved.

A Draught Preventer has been devised by Mr. Edward A. Harman, M.I.C.E., of Huddersfield, which consists of a roller about 2in. in diameter and of the width of the door; it is attached to the inside by means of a pair of lugs having vertical slots in them, thus allowing the roller to slide freely up and down over any irregularities of the floor. In some cases the roller may be in several pieces, about 3in. long, on an axle.

Mr. Edward Clark, architect of the Capitol at Washington, died recently. Mr. Clark was born in Philadelphia in 1822, and was assistant to Dr. Thomas U. Walter when the latter was engaged in the construction of the wings and dome of the Capitol from his own designs. On Dr. Walter's resignation of his position, in 1865, Mr. Clark succeeded him and has ever since had charge of the building.

Statuary for Blackfriars Bridge.—At last week's meeting of the Court of Common Council it was agreed: "That it be referred to the Bridge House Estates Committee to consider and report on the practicability and cost of completing the original design of Blackfriars Bridge by the erection of suitable statuary on the four pedestals of the bridge in commemoration of the Coronation of His Majesty the King."

The Clerk of Works Association of Great Britain held its nineteenth annual dinner at the Holborn Restaurant on Monday evening last. There were over 200 present, and the chair was occupied by Mr. Aston Webb, F.R.I.B.A. Mr. John Davies, M.C.W.A., in a short speech proposed "The Architects and Surveyors," which was responded to by Messrs. Edwin T. Hall, F.R.I.B.A., C. F. Selby, F.S.I., and James Bartlett, M.S.A. Mr. John Aitchison toasted the "Worshipful Company of Carpenters," with which body the Clerk of Works Association have long had close connection. This was responded to by the Master of the Company, Mr. John Willson, M.P. The toast of the evening was, however, "The Clerk of Works Association," which was proposed in a telling speech by the chairman, who pointed out what he considered to be flaws in the Association in the question of lack of rules, age-limit, and the non-existence of a benevolent fund. He also emphasised that much could be done by the clerks of works to modify what was spoiling the building trade—the action of unions in trying to restrict the output by making two men do one man's work. The president, Mr. Spencer Green, in reply stated that the Association was now applying for articles of incorporation, and all the chairman's points would be dealt with. Other toasts were duly honoured, and an interesting musical programme filled up the evening.

A Monument to Colonel Villebois Mareuil will be erected in Montaign, Vendée.

The late Mr. F. W. Porter, J.P., F.R.I.B.A., of Moyle Tower, Hythe, who died on November 17th last in his eighty-first year, left an estate of the value of £39,801 14s. 11d.

A New Central Board School for Perth has been opened. It has accommodation for 620 children, and comprises ten classrooms, apart from teachers' rooms, while it is fitted up with the most modern sanitary, heating and electric light arrangements. At the Caledonian Road school a new workshop, cookery-room, laundry and gymnasium have been provided. The total cost of the new school is £12,970, while the cost of the extension at the Caledonian Road school is estimated at about £500.

Surveying and Sanitary Notes.

Treatment of Sewage.—At last week's meeting of the Institution of Civil Engineers Mr. J. Davis, M.I.C.E., read a paper on "The Sewerage Systems of Sydney, N.S.W., and its Suburbs," which, he said, were now nearing completion, having involved an expenditure of £3,300,000. About 400 miles of sewers were in use, serving a population of 290,000; but these figures would be largely increased with the extension of reticulation. The main systems, at a final cost of about £4,000,000, would provide for a prospective population of over 1,000,000. Mr. W. Naylor, A.M.I.C.E., in a second paper dealt with the general experience already obtained in connection with the treatment of domestic sewage containing trades waste. His conclusion was that in only two cases, first, with sewage containing an abundance of trades waste, consisting largely of starch or starchy products, such as that from breweries, distilleries, bleach-works, dye-works, and calico-print works, and secondly, with trades waste charged with free chlorine, was there difficulty of any but a mechanical nature in treating such sewage and waste bacterially. The self-purification of certain samples of manufacturers' waste on standing had suggested the experiment of trying colour-shop waste from calico-print works, brewery-waste, &c., on an active bacterial filter. It had been found that, although a certain amount of disintegration took place, it was accompanied by "souring," and the effluent was unsatisfactory. This "souring" had been found to be prevented by preliminary contact with putrid sewage, or sewage-sludge, which probably resulted in the introduction of more active and competitive ferments than the lactic acid or other acid ferment.

The Sanitary Inspectors' Association held its annual dinner at the Holborn Restaurant last Saturday night. Sir James Crichton-Browne, the president, occupied the chair, and he thought the pressing question with which they had to concern themselves now was that of the housing of the people in town and country. In the solution of that problem sanitary inspectors could give invaluable assistance and help. On behalf of the members he presented to Mr. W. H. Grigg, the late chairman of the council, a diamond ring and an illuminated address in recognition of his services to the association. He looked forward to the time when all health questions in this country and the care of the sick in body and mind would be placed under the control of a separate department of the Government, represented by a Cabinet Minister. Public security would be enhanced, economy and sound administration would be advanced by the creation of a properly equipped ministry of health. He read an extract from a letter which had been received by Mr. Tidman from the hon. solicitor, Mr. Aubrey Richardson, stating that at their last meeting the trustees of the Chadwick Trust on the suggestion of Sir James Crichton-Browne, resolved that a sum of £50 and a Chadwick medal be presented to that member of the Sanitary Inspectors' Association whose official report or reports made in the discharge of his duties during the year 1902 should, in the opinion of the trustees, be judged most conducive to the advancement of municipal or rural sanitation.

New Patents.

These patents are open to opposition until March 8th.

1901.—**Hydraulic Jacks.**—942. J. C. CRELLIN, 40, Park Lane, Liverpool. The device consists of a telescopic hydraulic ram vertically mounted on a wheeled carriage and having a platform at its head. The truck also carries a water-reservoir and a hand pump.

Windows.—2,098. J. THORPE, 79, Westbury Street, Pinfold Lane, Sheffield. The object of this invention is to do away with cords, pulleys and weights. At each side of the window is a box enclosing a coiled spring, to which two slotted segmental arms are pivoted, being connected by a pin which passes through a plate on the bottom rail. By these means the window can be retained in any position.

Soil, Rainwater and other Pipes.—3,272. G. T. ASHTON, 16, Derby Range, Heaton Moor, Stockport. The pipe is plain at one end and has a socket at the other which is divided vertically into two parts held together by nuts and bolts. If a pipe is required to be removed for repairs or other purposes, the top or loose half of the socket is unfastened and a new pipe substituted. The invention also provides for the casting of the top half of the socket on to an otherwise plain pipe, so that both are removed together.

Drying Walls.—18,032. H. SPATZ, 106A, Gitschinerstrasse, Berlin. In order to quickly dry whitewashed and other walls they are coated with a solution of oleic acid, 10lbs., dissolved in benzine 10lbs.

Excavating Apparatus.—20,023. E. H. TAYLOR, 512, Commercial Avenue, Cairo, Illinois, U.S.A. A large auger is arranged within a pipe which is supported vertically and has a hopper at its upper end. At the bottom of the pipe is a horizontal auger driven by power. This cuts away the material, which is then carried by the screw into the hopper, whence it is discharged.

The following specifications were published on Thursday last, and are open to opposition until March 15th. A summary of the more important of them will be given next week.

1901.—301, ROBERTSON & HAMILTON, suspending window sashes. 400, GUSTORF, protecting cover for new buildings. 671, WALLER, partition walls. 677, HASSALL, MELLOR & BROOK, flushing water-closets. 857, BEVIS & HUTCHINGS, instantaneous grip vices. 2,984. DOMAN, brackets for supporting rainwater gutters. 3,119, NICHOLLS & GILL, water or other taps. 3.695, JOHNSTONE, heating of greenhouses, conservatories, &c. 4,164, WILLCOX, portable mortar or concrete-mixing machines. 4,602, FERRY, domestic and other firegrates. 4,630, HITCHINS, asbestos linings for buildings. 4,772, LINTOTT, machinery for making bricks. 5,109, FULCHER, roofing buildings. 5,450 CANCALON, ceilings. 8,206, SPEIGHT, ladders. 10,160, KEEBLE, manufacture of bricks, tiles, &c. 17,073, SMITH, metallic coupling for temporarily connecting chains, ropes, &c. 19.299, RALLINGS, ball valves. 20.821, WELLMAN, sash locks 22,828, ANDERSON, combined brick and tile facings for walls 22,829, ANDERSON, systems of ventilating fireproof buildings. 24,237, POTTER, window-fasteners. 24.486, JUNKE, couplings for wrought-iron pipes. 24,923, BOIVIE, manufacture of artificial stone.

A City Architect wanted for Manchester.—The Town Hall Committee of the Manchester City Council last week considered a report on the reorganisation of the City Surveyor's Department as suggested by the special committee which recently had this subject under consideration. It was stated that the Committee, with the assistance of the City Surveyor, had made a few changes in the internal working of the department, which involved the resignation of one official and one or two new appointments. As a result of this reorganisation it has been decided to recommend the Council to set up an independent City Architect's Department, to take over the architectural work hitherto done in the Surveyor's office. It was also decided to recommend that a City Architect should be advertised for at a salary of £600 a year.

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should be sufficient to determine all readers around London to adopt No. 3 of

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THE MANAGER, BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Feb. 6	Maesteg—School, Classrooms, &c.	School Board	E. W. Burnett & Son, Architects, Tondu, near Bridgend.
" 6	Drogheda, Ireland—10 Labourers' Cottages, &c.	Meath Rural District Council	P. Dowdall, Clerk, Council Office, Workhouse, Drogheda.
" 6	Cardiff—Engine House, &c., at Pumping Station	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
" 6	Radcliffe, Lancs—Octagonal Brick Chimney	Urban District Council	W. L. Rothwell, Engineer, Council Offices, Radcliffe.
" 6	Retford—Church	——	T. Glen, junr., Accountant, Union Street, Retford.
Feb. 6	Great Lever, Bolton—Cotton Mill	Beehive Spinning Co., Ltd.	Potts, Son & Hennings, 79 St. George's Road, Bolton.
" 6	Tooting, S W.—Covered Ways at Workhouse	Union Guardians	C. A. Sharpe, 11 Old Queen Street, Queen Anne's Gate, S.W.
" 7	Stockingfield—Engine Shed, Offices, Tank House, &c.	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
" 7	Aberaman, Wales—2 Blocks of 12 Houses and 1 Villa	——	G. A. Treharne, 18 Canon Street, Aberdare.
" 7	Bowness—Additions, &c., to Hotel and Villas	R. Rigg	S. Shaw, Architect, Kendal.
" 7	Leicester—Public Baths	Baths Committee	A. H. Hind, 3 Grey Friars, Leicester.
" 7	Shooters' Hill, Greenwich—2 Brick Vaults at Cemetery	Greenwich Borough Council	Rating and Adoptive Acts Department, Royal Hill, Greenwich.
" 7	Sheffield—Shops, Offices, &c.	Corporation	Gibbs & Flockton, 15 St. James's Row, Sheffield.
" 7	Treorky, Wales—18 Houses	——	M. Falcon, 33 Bute Street, Treorky.
" 7	Blenau Gwent, Wales—Rebuilding Chapel	Primitive Methodists	A. Jones, Rosebery Street, Abertillery.
" 7	Crumlin, Mon—House	——	R. L. Roberts, Architect, Abercarn.
" 7	Kirkcaldy—Carpenter's and Plasterer's Work to Tramcar Depôt.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
" 8	Leeds—Police Station and Free Library	Watch Committee	W. H. Thorp, 61 Albion Street, Leeds.
" 8	Londonderry—Residence	W. N. M'Guiness	J. P. M'Grath, 28 Carlisle Road, Londonderry.
" 8	Shrewsbury—Headquarters Police Offices	Standing Joint Committee	A. T. Davis, County Surveyor, Shire Hall, Shrewsbury.
" 8	Belfast—Fireclay Goods, Cement, Slates, &c.	Belfast & Northern Counties Rlwy. Co.	Mr. Ellis, Stores Superintendent, York Road Station, Belfast.
" 8	Ballymena, Ireland—Medical Officer's Residence, &c.	Union Guardians	C. Johnston, Clerk, Workhouse, Ballymena.
" 8	Donegal—Bathroom and Water-Closets	Union Guardians	D. C. Pearson, Clerk, Workhouse, Donegal.
" 10	Falkirk—Poorhouse	Parish Council	A. & W. Black, Architects, Falkirk.
" 10	Port Talbot, Wales—Business Premises	W. Bowers	G. P. Davies, Architect, Port Talbot.
" 10	Bilston, Staffs—Car Shed and Offices, &c.	Wolverhampton Electric Tramways, Ltd.	Secretary, Donnington House, Norfolk Street, Strand, W.C.
" 10	Coventry—5 Cottages and Buildings at Sewage Pumping Station.	Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 10	London, S.W.—Cement, Lime, Bricks, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 10	Eastbourne—Technical Institute, Library, Science and Art Schools, Fire Station, &c.	Corporation	Borough Engineer, Town Hall, Eastbourne.
" 10	Griffithstown, Wales—Re-erecting Bridge	Panteg Urban District Council	D. J. Lougher, Engineer, Pontypool.
" 10	Stockton—Church	Baptist Connection	T. W. T. Richardson, 57 High Street, Stockton.
" 10	Cardiff—Extensions of Kitchens, Larders, &c.	Infirmary Guardians	E. Seward, Architect, Cardiff.
" 11	Bradford—Entrance Looge and Laundry at Hospital	Corporation	F. E. P. Edwards, City Architect, Chapel Lane, Bradford.
" 11	Wimbledeon—Technical Institute	Surrey County Council	G. H. Fox, 9 John Street, Adelphi, W.C.
" 11	Whitehaven—Infirmary	Guardians	G. Boyd, 33 Queen Street, Whitehaven.
" 11	Porthcawl, Wales—Gardener's Cottage	——	S. H. Stockwood, Solicitor, Bridgend.
" 11	Wembworthy, N. Devon—Re-seating Parish Church	——	E. H. Harbottle & Son, Architects, County Chambers, Exeter.
" 11	Plymouth—Goods Shed, &c.	Great-Western Railway Co.	Engineer, Plymouth (North Road) Station.
" 11	West Ham, E.—Slates, Lime, Portland Cement, &c.	Borough Council	Borough Engineer, Town Hall, Stratford, E.
" 11	West Ham, E.—47 Double Tenements and 12 Single Tenements.	Borough Council	Borough Engineer, Town Hall, Stratford, E.
" 11	Southall, Norwood—Isolation Hospital	Urban District Council	G. E. T. Laurence, 22 Buckingham Street, Adelphi, W.C.
" 12	Tweedmouth—24 Cottages	North-Eastern Railway Co.	W. Bell, Company's Architect, Central Station Newcastle on-Tyne.
" 12	Eccleshill, Bradford—Wool and Cloth Warehouse	——	J. Kendall and J. H Bakes, Calverley Chambers, Victoria Square, Leeds.
" 12	Limerick—Alterations, &c., at Asylum	Management Committee	Carroll, Batchelor & Browne, Architects, Dublin.
" 12	London, W.—Lime, Cement, Jobbing Works, &c.	Hammersmith Borough Council	H. Mair, Borough Surveyor, Hammersmith Town Hall, W.
" 12	Neath—Inn	——	J. C. Rees, Architect, Church Place, Neath.
" 12	Horsham—House	——	W. Buck, Architect, Horsham.
" 13	Cramlington—Twenty-seven Workmen's Houses	Co-operative Society	Secretary to Society, Cramlington.
" 13	Woolwich—Bricks, Cement, &c	Borough Council	F. Sumner, Borough Engineer, Mascey Road, Plumstead.
" 13	Halifax—Pair of Semi-detached Villas	——	R. Horsfall & Son, 22A Commercial Street, Halifax.
" 13	Thomastown, Ireland—Repairs, &c., to Fever Hospital	Workhouse Guardians	L. Barry, Clerk, Workhouse, Thomastown.
" 14	Aldreth—Bridge over West River	County Council	H. Leete, County Surveyor, Ely.
" 14	Parkgate, near Rotherham—Working Men's Club	——	Garside & Pennington, Architects, Pontefract.
" 15	Chelmsford—Twelve Cottages	Town Council	Borough Surveyor, 16 London Road, Chelmsford.
" 15	Leadgate, Durham—House, Stable, &c.	R. Laidlaw	R. Laidlaw, Front Street, Leadgate.
" 15	Leeds—Baths, Lavatory, Dormitories, &c.	——	T. Winn & Sons, 92 Albion Street, Leeds.
" 15	Leeds—Extension and Alterations of Warehouses	D. Dixon & Son, Ltd.	T. Winn & Sons 92 Albion Street, Leeds.
" 17	Accrington—Shops, Offices, Stores & Assembly Rooms	Provident Co-Operative Society	Haywood & Harrison Architects, Post Office Chambers, Accrington.
" 17	Stamford—Engine-House, &c.	Corporation	J. B. Everard, 6 Millstone Lane, Leicester.
" 18	Wrexham—Alterations, &c., to Market, &c.	Town Council	Borough Surveyor, Guildhall, Wrexham.
" 18	London, E.—Block of Artizans Dwellings	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 18	Bradford—Markets Extension	Corporation	T. C. Hope & Son, 23 Bank Street, Bradford.
" 19	Southend-on-Sea—Cemetery Chapel	Church League	S. I. Adams, Architect, Weston Chambers, Weston Road, Southend.
" 19	Torquay—Bricks, &c.	Water Committee	W. Ingham, Water Engineer, Torquay.
" 20	Dromalane, Newry—24 Villa Residences	——	W. J. Watson, Benvenue, Rostrevor.
" 20	Bradford—Mission Hall, &c.	——	W. J. Morley & Son, 259 Swan Arcade, Bradford.
" 21	Croydon—Enlargement of Post Office	Commissioners of H.M. Works, &c.	A. Paull, 6 Quality Court, Chancery Lane, W.C.
" 22	Dublin—Bank House, Shop and Offices	Northern Banking Co., Ltd.	W. H. Stephens & Son, 13 Donegall Square North, Belfast.
" 24	Beckenham—Bricks, Cement, &c.	Urban District Council	Surveyor, Council Office, Beckenham.
" 26	London, N.E.—Casual Wards, Laundry, &c.	Hackney Union Guardians	F. R. Coles, Clerk, Hackney Union, Homerton, N.E.
" 26	Belfast—Technical Institute	Corporation	S. Stevenson, 83 Royal Avenue, Belfast.
" 28	Lurgan, Ireland—National School	Presbyterian Church Committee	H. Hobart, Architect Dromore, co. Down.
" 28	Helston—Police Station, &c.	Cornwall County Council	C. Caldwell, Architect, Victoria Square, Penzance
March 3	Bracebridge, nr. Lincoln—Alterations, &c., to Asylum	Visiting Committee	Giles, Gough & Trollope, 28 Craven Street, Charing Cross, W.C.
No date.	Holmgate, Clay Cross—6 Pairs of Semi-detached Houses	——	E. Oxley, Architect, Clay Cross.
	ENGINEERING:		
Feb. 6	Sunderland—Tramcar Bodies	Corporation	J. F. C. Snell, Borough Electrical Engineer, Town Hall, Sunderland.
" 6	Groomsport, co Down—Improvement of Harbour	County Council	County Surveyor, Courthouse, Downpatrick.
" 8	Harrogate—Lancashire Boiler	Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
" 10	Sebastopal, near Griffithstown—Re-erecting Bridge over Canal.	Panteg Urban District Council	D. J. Lougher, Engineer, Pontypool
" 10	Redruth—Lighting Town	Urban District Council	Surveyor, Station Hill, Redruth.
" 10	Shipley, Yorks—Switchboard, &c.	Urban District Council	J. Lindow, Clerk, Manor House, Shipley.
" 11	West Ham, E.—Electrical Stores	Borough Council	Electrical Engineer, Town Hall West Ham, E.
" 11	London, E.C.—Bridgework	Bengal-Nagpur Railway Co., Ltd.	Secretary, 132 Gresham House, Old Broad Street, E.C.
" 11	New Mills—Lancashire Boiler	Urban District Council	G. B. Smedley, Engineer, Town Hall, New Mills.
" 11	New Mills—Condenser	Urban District Council	G. B. Smedley, Engineer, Town Hall, New Mills.
" 12	Salford—Coal-breaking Machinery, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
" 12	Bournemouth—Electric Tramway Materials	Town Council	Lacey, Clirehugh & Sillar, 2 Queen's Anne's Gate, Westminster.
" 12	Newcastle-on-Tyne—Tramway	Corporation	City Engineer, Town Hall, Newcastle.
" 12	Birmingham—Reconstructing Road Bridge	Corporation	J. Price, City Engineer, Council House, Birmingham.
" 12	Newcastle-on-Tyne—Railway Bridge and Approaches	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
" 12	Penshaw Junction and Wapping Bridge—Widening Line.	North-Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle-on-Tyne.
" 12	Watford—Gasholder Tank, &c.	Gas and Coke Co.	H. E. Jones & Son, Engineers, Palace Chambers, Westminster, S.W.
" 13	Manchester—Condensers, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.
" 13	Leyton, Essex—Steam, Water, &c., Pipes	Electric Lighting Committee	Engineer, Electricity Works, Cathall Road, Leytonstone.
" 15	Wokingham—Laying Water Mains	Rural District Council	J. F. Sargeant, 8 Shute End, Wokingham.
" 17	Croydon—Electric Motor-cars	Town Council	E. W. Monkhouse, 14 Old Queen Street, Westminster, S.W.
" 17	Bristol—Dock (30 acres)	Docks Committee	W. W. Squire, Engineer, Underfall Yd, Cumberland Basin, Bristol.
" 17	London, E.C.—Widening London Bridge	Corporation	City Surveyor, Guildhall, E.C.
" 18	Bangor, Wales—Ammonia Still	Gas Committee	J. Smith, Engineer, Gasworks, Bangor, N. Wales.
" 18	London—Steam Boilers	Holborn Union Guardians	J. Buley, Suffolk House, Laurence Pountney Hill, E.C.
" 18	London, E.C.—175 Goods Waggons	Bengal-Nagpur Railway Co., Ltd.	Secretary 132 Gresham House, Old Broad Street, E.C.
" 19	Louvain, Belgium—Lighting City	——	Burgomaster, Louvain, Belgium.
" 20	Liscard, Wallasey, Cheshire—Feed-Water Heater, &c.	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 21	Walsall—Tramways	Corporation	R. H. Middleton, Borough Surveyor, Walsall.
" 24	Bridgwater—Collecting Trenches, &c.	Rural District Council	T. M. Reed, Clerk, Bridgwater.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	FURNITURE:		
Feb. 10	Ramsgate—Blinds for Infectious Diseases Hospital	Isle of Thanet Joint Hospital Board	A. B. Burrows, 72 High Street, Ramsgate.
" 13	Carrick-on-Shannon—12 Iron Beds, &c.	Guardians	A. O'Conor, Clerk, Workhouse, Carrick-on-Shannon.
	IRON AND STEEL:		
Feb. 6	Rainhill, Lancs—Pipes	Gas and Water Co.	F. Pritchard, Secretary, Rainhill.
" 8	Edinburgh—Cast-iron Drains, &c.	Magistrates and Council	Interim Burgh Engineer, Edinburgh.
" 8	Belfast—Railway Stores	Belfast & Northern Counties Railway Co.	Mr. Ellis. Stores Superintendent, York Road Station, Belfast.
" 10	Prestatyn, Wales—Cast-iron Pipes	Urban District Council	Beloe & Priest, 13 Harrington Street, Liverpool.
" 10	London, S.E.—Iron, Steel, Ironmongery, Gas Fittings, &c.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
10	London, S.W.—Castings, Lamp Columns, Iron, Steel	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth S.W.
10	Belfast—Railway Stores	Belfast and County Down Railway Co.	S. J. Brittain, Secretary, Queen's Quay Terminus, Belfast.
" 11	West Ham, E.—Iron Castings, Ironmongery, &c.	Borough Council	Borough Engineer, Town Hall, Stratford, E.
" 11	London, W.—Steel Bridge Girders, &c.	Great Western Railway Co.	Engineer, Paddington Station, London.
" 11	Hastings—Stop-cock Boxes	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
" 11	London, E.C.—Files, Tools and Stores	Southern Mahratta Railway Co., Ltd.	Secretary, 46 Queen Anne's Gate, Westminster, S.W.
" 12	Richmond, Surrey—Ironfounders' Work, &c.	Town Council	J. H. Brierley, Borough Surveyor, Richmond.
" 12	London, W.—Tools, Implements, &c.	Hammersmith Borough Council	H. Mair, Borough Surveyor, Town Hall, Hammersmith.
" 12	Aberdeen—Steel Tramway Poles	Corporation	J. A Bell, City Electrical Engineer, Corporation Electricity Works, Cotton Street, Aberdeen.
" 12	Portsmouth—Ironmongery, Castings, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Portsmouth
" 13	Woolwich—Ironmongery, Sewer Ironwork, &c.	Borough Council	F. Sumner, Borough Engineer, Mascev Road, Plumstead.
" 15	Plymouth—Ironmongery. Ironwork, Bolts, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 19	Torquay—Ironmongery, Stop-cocks and Taps	Water Committee	W. Ingham, Water Engineer, Torquay.
April 14	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
Feb. 7	King's Lynn—Outside Painting at Hospital	—	West Norfolk and Lynn Hospital, King's Lynn.
" 7	Kirkcaldy—Plumbers' Work at Tramcar Depôt	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
" 8	Belfast—Varnishes, Paints, Oils, Colours, &c.	Belfast and Northern Railway Co., Ltd.	Mr. Ellis, Stores Superintendent, York Road Station, Belfast.
" 10	London, S.W.—Painters' Materials	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 11	West Ham, E.—Lead, Plumbing, Oils, Colour, Brushes	Corporation	Borough Engineer, Town Hall, Stratford, E.
" 11	London, S.E.—White and Red Leads, Painters' Sundries.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
" 11	London, E.C.—Paints, Red & White Lead, Turpentine	Southern Mahratta Railway Co., Ltd.	Secretary, 46 Queen Anne's Gate, Westminster, S.W.
" 11	Manchester—Plumbing and Drainage-work of Houses	—	H. Prescott, Manager of House Drainage Department, Town Hall, Manchester.
" 12	London, W.—Stores	Hammersmith Borough Council	H Mair, Borough Surveyor, Town Hall, Hammersmith.
" 12	Richmond, Surrey—Oil, Paints, &c.	Town Council	J. H. Brierly, Borough Surveyor, Richmond.
" 12	Stratford, E.—Painting, Graining, &c., at Court House	Essex County Council	F. Whitmore, County Architect, Shire Hall, Chelmsford.
" 12	Portsmouth—Brushes, Paints, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Porstmouth.
" 13	London, S.E.—Brushes, Oils, Colours, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Town Hall, Kennington Green, S.E.
" 15	Plymouth—Paint, Glass, Brushes, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
" 19	Torquay—Lead, Oils, Paints, &c.	Water Committee	W. Ingham, Water Engineer, Torquay.
	ROADS AND CARTAGE:		
Feb. 6	Southampton—Stores, &c.	Corporation	W. H. Killick, Borough Engineer, Municipal Offices, Southampton.
" 6	Larne, Ireland—Steam-Rolling	Urban District Council	W. G. Younge, Clerk, Town Hall, Larne.
" 6	East Retford—Road Materials	Rural District Council	T. Henry, Surveyor, Retford.
" 6	London, W.—Making-up	Ealing Town Council	C. Jones, Borough Engineer, Town Hall, Ealing, W.
" 7	Hertfordshire—Granite and Slag	County Council	U. A. Smith, 41 Parliament Street, Westminster, S.W.
" 7	Stockport—Road Works	Corporation	J. Atkinson, Borough Surveyor, Central Buildings, St. Peter's Gate, Stockport.
" 7	Stockport—Materials	Corporation	J. Atkinson, Borough Surveyor, Central Buildings, St. Peter's Gate, Stockport.
" 8	Isle of Ely—Materials	County Council	H. F. Simpson, County Surveyor, Wisbech.
" 8	Rugby—Granite, &c.	Rural District Council	J. W. Pendred, Clerk, Rugby.
" 8	Chelmsford—Gravel or Picked Stones	Essex County Council	P. J. Sheldon, Chief Surveyor, County Offices, Chelmsford.
" 10	Jarrow—Road Works	Urban Sanitary Authority	J. Betree, Borough Surveyor, Jarrow.
" 10	Kingston-upon-Thames—Road	Guardians	J. Edgell, Clerk, Union Offices, Coombe Road, Kingston-on-Thames.
" 10	London, S.W.—Materials. Paving, Horse-Hire, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 11	London, S.E.—Materials, Paving, Brooms, &c.	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, Camberwell, S.E.
" 11	West Ham, E.—Materials	Corporation	Borough Engineer, Town Hall, West Ham, E.
" 11	Tyldesley, Lancs—Materials	Urban District Council	W. J. Matthews, Clerk, Tyldesley, Lancs.
" 11	Tyldesley, Lancs—Street Works	Urban District Council	J. B. Smith, Engineer, Council Offices, Tyldesley.
" 11	Lutterworth—Granite	Rural District Council	J. C. Coates, District Surveyor, Lutterworth.
" 12	Barrow-in-Furness—Stores and Materials	Corporation	Borough Engineer, Town Hall, Barrow-in-Furness.
" 12	London, W.—Granite, Flints, Brooms, Horses, &c.	Hammersmith Borough Council	H. Mair, Borough Surveyor, Town Hall, Hammersmith.
" 12	Pentre, Wales—Street-sweeping Brushes, Carts, &c.	Rhondda Urban District Council	W. J. Jones, Surveyor, Council Offices, Pentre, R.S.O., Glam.
" 12	Richmond, Surrey—Harness, Road Materials, Cement, Paving.	Town Council	J. H. Brierley, Borough Surveyor, Richmond.
" 12	Birkenhead—Materials	Corporation	C. Brownridge, Borough Surveyor, Town Hall, Birkenhead.
" 12	London, N.E.—Tar-paving Court	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
" 12	Portsmouth—Stores, Street Works, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Portsmouth.
" 13	London, S.E.—Materials, Cartage, &c.	Lambeth Borough Council	H. Fdwards, Borough Enginer, Town Hall, Kennington Green, S.S.
" 13	Woolwich—Road Materials, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 15	Plymouth—Road Metal. Brooms, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 15	Chelmsford—Team Labour	Essex County Council	P. J. Sheldon, Chief Surveyor, Duke Street, Chelmsford.
" 15	Bedford—Materials	County Council	County Surveyor, Shire Hall, Bedford.
" 17	East Retford—Granite	Corporation	J. D. Kennedy, Borough Surveyor, East Retford.
" 17	Liverpool—Road-making, &c.	Select Vestry	E. Kirby, 5 Cook Street, Liverpool.
" 17	Bristol—Paving	Sanitary and Improvement Committee	T. H. Yabbicom, 63 Queen Square, Bristol.
" 18	Long Sutton, Lincs—Granite and Slag	Urban District Council	S. S. Mossop, Clerk, Long Sutton.
" 19	Leeds—Tar Macadam	Corporation	City Engineer, Municipal Buildings, Leeds.
" 22	Belper—Material	Rural District Council	R. C. Cordon, Surveyor, Duffield, near Derby.
" 24	Beckenham—Team Labour, Materials, &c.	Urban District Council	Surveyor, Council Offices, Beckenham.
Mar. 4	London, S.W.—Materials	Middlesex County Council	H. T. Wakelam, County Surveyor, Middlesex Guildhall, Westminster, S.W.
" 4	London, S.W.—Cartage	Middlesex County Council	H. T. Wakelam, County Surveyor, Middlesex Guildhall, Westminster, S.W.
" 5	South Shields—Materials	Corporation	S. E. Burgess, Borough Surveyor, Chapter Row, South Shields.
	SANITARY:		
Feb. 6	Blaydon-on-Tyne—Scavenging, &c.	Urban District Council	R. Biggins, Sanitary Inspector, Council Offices, Blaydon-on-Tyne.
" 7	Knutsford—Sewers	Urban District Council	W. J. Downes, Surveyor, Council Offices, Knutsford.
" 8	Sudbury, Suffolk—Sewerage Works	Corporation	Hinds & Son, Estate Agents, Walmer.
" 10	London, S.W.—Stoneware Pipes, Drain Testers, Disinfectants, &c.	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 10	Ormskirk, Lancs—Sewage Works	Urban District Council	J. T. Wood, 3 Cook Street, Liverpool.
" 10	Latham—Sewage-Disposal Works	Urban District Council	J. T. Wood, 3 Cook Street, Liverpool.
" 11	South Normanton—Sewering	Blackwell Rural District Council	H. Silcock, 34B West Gate, Mansfield.
" 11	Hetton, Durham—Scavenging	Urban District Council	J. G. Baty, Clerk, Council Offices, Houghton-le-Spring, R.S.O.
" 11	West Ham, E.—Stoneware Pipes, Disinfectants, &c.	Corporation	Borough Engineer, Town Hall, West Ham, E.
" 12	Portsmouth—Soneware Pipes, &c.	Corporation	Superintendent, Electric Light Station, Gunwharf Rd., Portsmouth.
" 12	London, W.—Drain Pipes, Disinfectants, &c.	Hammersmith Borough Council	H. Mair, Borough Surveyor, Town Hall, Broadway, Hammersmith.
" 13	Woolwich—Drain Pipes, Disinfectants, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 13	London, S.E—Scavenging, Drain Pipes, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Town Hall, Kennington Green, S.E.
" 15	Plymouth—Brooms, Disinfectants, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 17	Stamford, Lincs—Sewers, &c.	Corporation	J. B. Everard, 6 Millstone Lane, Leicester.
" 19	Torquay—Earthenware Pipes, &c.	Water Committee	W. Ingram, Water Engineer, Torquay.
" 24	London, N.—Sewer, &c.	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	TIMBER :		
Feb. 8	Belfast—Timber	Belfast and Northern Counties Railway Co.	Mr. Ellis, Stores Superintendent, York Road Station, Belfast.
" 10	London, S.W.—Timber	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
" 12	London, W.—Timber	Hammersmith Borough Council	H. Mair, Borough Surveyor, Town Hall, Broadway, Hammersmith.
" 12	Richmond, Surrey—Timber	Town Council	J. H. Brierly, Borough Surveyor, Richmond.
" 13	Woolwich—Timber	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Feb. 15	Montrose—Ornamental Memorial Fountain	——	A. Middleton, Solicitor, Montrose.
" 26	Kanturk, Ireland—Water-Supply Scheme	£20.	T. Guiney, Clerk, &c., Rural District Council, Workhouse, Kanturk.
Mar. 1	Aldershot—Laying-out Pleasure Ground	£20, £10, £5.	N. F. Dennis, Surveyor, Urban District Council, Offices Aldershot.
" 5	New Malden, Surrey—Public Offices, Fire Station, Mortuary, &c.	£25, £10.	C. T. Lewis, Clerk, Maldens and Coombe Urban District Council, 7 Market Place, New Malden.
" 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
" 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
" 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.
No date.	Stakeford, Northumberland—Bridge over River	——	E. E. Charlton, 32 Grainger Street West, Newcastle-on-Tyne.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BILSTON (NORTH STAFFS).—For electrical plant, to be installed in their sub-station at Bilston, Staffordshire, for the Midland Electric Corporation for Power Distribution, Ltd.: (Contract No. 1, Section N) supply and erection of a battery of accumulators:—

Electrical Construction Corporation	£10,070 15
Johnson & Phillips	9,806 0
Bruce Peebles & Co.	8,339 0
General Electric Co., England	8,171 0
Ferranti, Ltd.	8,062 0
Brush Electrical Engineering Co.	8,047 0
Armstrong Whitworth Co.	7,900 0
British Schuckert Co. (alternative)	6,531 10
British Schuckert Co. (alternative)	6,528 0
International Electric Engineering Co.	6,225 0
British Schuckert Co. (alternative)	5,976 15
British Westinghouse Co.*	5,850 13
British Schuckert Co.	5,661 15
Lechmeyer Electric Co., Ltd.	3,565 0

* Accepted.

BODMIN (CORNWALL).—For the erection of extensions and additions to the present County Asylum buildings at Bodmin, Cornwall. Mr. Silvanus Trevail, architect:—

Wakeham Bros.	£121,087
J. Shillitoe & Sons	111,170
Wm. King & Sons	102,700
C. Brealy	101,856
Thos. Rowbotham	101,500
H. E. Skinner	99,156
H. Willcock & Co.	94,300
J. & M. Patrick & Co.	94,009
A. Krauss & Sons	92,325
A. N. Coles	92,105
R. Wilkins & Sons	90,850
W. E. Blake	90,193
S. Trehane	88,795
Pethick Bros.,* Plymouth	87,973

* Accepted.

CHEAM, SUTTON (SURREY).—For the erection of a block of six four-roomed cottages, for Messrs. C. T. Brock & Co. Messrs. Barrett & Driver, architects, 53 Blomfield Road, Maida Vale, W.:—

T. Skinner, Beckenham	£1,245
H. Somerford & Sons, Clapham	1,022
E. J. Burnard, Wallington	966
R. Roberts, Croydon	738
Ludlow & Martin*	735

* Accepted.

KING'S LYNN (NORFOLK).—For work at the High School for Girls. Mr. Herbert J. Green, architect, 31 Castle Meadow, Norwich:—

H. W. Barnes	£3,862 7 0
W. H. Brown	3,757 16 0
P. Banyard, Cambridge	3,473 19 7
J. W. Collins, Downham Market	3,453 0 0
J. Medwell	3,440 1 10
Renant Bros.	3,383 0 0
Tash, Langley & Co.	3,359 10 9
A. F. Foreman	3,358 5 0
Robert Dye	3,346 0 0
Bardell Bros.	3,257 0 0
Reuben Shanks, Chatteris, Cambs	3,186 2 0
J. Cracknell,* Peterborough	3,085 7 0

* Accepted conditionally. [Rest of King's Lynn.]

KING'S LYNN.—For the erection of a shop residence and a dwelling-house in Tennyson Avenue for Mr. J. T. Bunkall. Messrs. W. Jarvis & Son, architects, Paradise Parade, King's Lynn.

J. W. Collins, Downham	£1,297 10 0
Bardell Bros.	1,259 0 0
R. Dye	1,235 0 0
Tash, Langley & Co.	1,223 0 0
F Foreman	1,181 18 6
Jas. Medwell*	1,170 10 0

* Accepted. [Rest of King's Lynn.]

KIRKCALDY.—Accepted for the extension of bakery at Mid Street, Pathhead, for the Pathhead and Sinclairtown Reform Co-operative Society, Ltd. Mr. D. Forbes Smith, A.R.I.B.A., architect, Kirkcaldy:—

Mason.—Menzies Bros., Kirkcaldy	£796 14 3
Joiner.—D. Wishart, Pathhead	227 17 7
Plasterer.—J. Easton, Kirkcaldy	147 17 6
Plumbers.—Blyth & Dougall, Sinclairtown	42 5 0
Ironwork.—J. Whitton, Pathhead	289 10 0
Slater.—R. Page, Pathhead	19 17 0
Total	£1,524 1 4

LITTLETON (MIDDLESEX).—For the erection of a new bridge in stone, brick, and iron across the River Ash at Littleton, in the county of Middlesex, for the Middlesex County Council. Mr. H. T. Wakelam, M.I.C.E., county engineer and surveyor, Westminster:—

Pethick Bros., Plymouth	£6,927 0 0
R. H. B. Neal, Plymouth	6,096 0 0
Wilkinson Bros., Finsbury Park	5,734 0 0
Kavanagh & Co., Surbiton	5,592 11 0
Patman & Fotheringham, Theobald's Road, W.C.	5,573 0 0
H. Morecroft, Acton	5,133 0 0
Wimpey & Co., Hammersmith	4,985 11 0
M. Dinnie, Chislehurst	4,328 17 6
W. Cuncliffe,* Kingston	4,215 0 0

* Accepted. [Engineer's estimate, £4,500.]

LONDON—For the erection of a house, Frognal Lane, Hampstead, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, 53 Blomfield Road, Maida Vale, W.:—

T. Turner, Watford	£8,970
C. Miskin & Sons, St. Albans	6,850
George Neal,* Kilburn	4,657

* Accepted.

LONDON—For the erection of stables, Frognal Lane, Hampstead, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, 53 Blomfield Road, Maida Vale, W.:—

T. Turner, Watford	£1,350
James Gibb, Hampstead	1,290
A. E. Bye, Willesden	1,235
George Neal*	1,234

* Reduced to £1,100 and accepted.

NOTTINGHAM.—For the erection of semi-detached villas, Sherwood Rise, Nottingham. Messrs. Collyer & Slater, architects, 8 Bridlesmith Gate, Nottingham:—

A. B. Clarke	£1,200	T. Long	£1,050
J. Hutchinson & Son	1,150	A. T. Key	1,033
T. Cuthbert	1,140	W. Appleby	1,020
S. Parnell	1,120	W. Maule	1,015
G. T. Lovett	1,100	T. Whittaker*	1,010

Plumbing, electric lighting, and painting to be let separately.

* Accepted. [All of Nottingham.]

OLD DALBY (MELTON MOWBRAY).—For the erection of a pair of four-roomed cottages, for Mr. C. J. Phillips. Barrett & Driver, architects, 53 Blomfield Road, Maida Vale, W.:—

T. & H. Denman, Melton Mowbray	£250
R. Holroyd,* Abb-Kettleby	205

* Accepted.

OXFORD.—For the erection of new stabling at No. 8 Clarendon Villas, Park Town, Oxford, for Mr. W. S. Embling. Mr. Herbert Quinton, architect, 22 George Street, Oxford:—

Money & Wild, Oxford	£379
Brucker Bros., Oxford	356
Kingerlee & Sons, Oxford	315
Ward, Bros., Oxford	290
J. Wooldridge,* Oxford	270

* Accepted.

PAIGNTON.—For alterations to warehouse and shops, for Messrs. Osborne & Son. Messrs. Bridgman & Bridgman, A.R.I.B.A. and M.S.A., architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

Builders work.

G. Webber	£620	H. Webber & Sons	£559
W. H. Lethbridge	599	R. Harris*	424
E. Westlake	579		

* Accepted.

SOUTH CREAKE.—For repairs to malting and brewery at South Creake. Mr. W. J. Dunham, M.S.A., architect:—

T. Gill, Norwich	£1,344 0
T. Hawes & Son, Keepham	1,225 0
S. Chapman & Son, Norwich	1,130 0
A. D. Boddy & Son, Norwich	1,125 0
H. S. Watling, Norwich	1,125 0
C. Tuthill, Fakenham	1,036 0
I. W. Fisher, Fakenham	1,035 0
J. Needs*	989 10

* Accepted.

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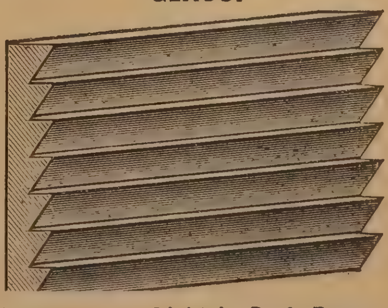

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		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0		—	
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	12	6
Sainfoin mixture ..	do.	4	10	0	5	5	0
Straw	do.	1	8	0	2	0	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	7	0	1	8	7
Colza Oil, English ..	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	9	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do	1	0	4½		—	
Linseed Oil, barrels ..	do	1	9	0	1	9	3
Petroleum, American ..	per gal.	0	0	6⅞	0	0	7
Do. Russian ..	do.	0	0	5¾	0	0	6⅜
Pitch	per barrel	0	7	0		—	
Shellac, orange	per cwt.	6	0	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	12	6	1	13	0
Tar, Stockholm	per barrel	1	3	0	1	3	6
Turpentine	per cwt.	1	9	3		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	71	0	0		—	
Iron, Staffs., bar ..	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	0	0		—	
Lead, pig, Soft Foreign ..	do.	11	2	6		—	
Do. do. English common brands	do.	11	5	0	11	7	6
Do. sheet, English 3lb per sq. ft. and upwards	do.	11	17	6		—	
Do. pipe	do.	12	5	0		—	
Nails, cut clasp, 3in. to 6in.	per ton	9	0	0		—	
Do. floor brads	do.	8	15	0		—	
Steel, Staffs., Girders and Angles	do.	5	15	0	6	5	0
Do. do. Mild bars ..	do.	6	10	0	7	0	0
Tin, Foreign	do.	108	5	0	108	15	0
Do. English ingots ..	do.	111	0	0	112	0	0
Zinc, sheets, Silesian ..	do.	21	0	0		—	
Do. do. Vieille Montaigne	do.	21	10	0		—	
Do. Spelter	do.	17	7	6	17	10	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec, Yellow ..	per load	4	7	6	6	0	0
Do. Pitch	do.	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	10
Do. Petersburg ..	per bundle	0	0	9	0	0	0½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	7	15	0	8	0	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	13	0	0	18	15	0
Do. do. 2nd „	do.	16	0	0		—	
Do. do. White	do.	9	5	0		—	
Do. Swedish	do.	8	5	0	16	0	0
Do. White Sea ..	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st ..	do.	15	0	0	27	0	0
Do. do. 2nd ..	do.	10	0	0	12	15	0
Do. do. 3rd &c.	do.	8	5	0	10	15	0
Do. Canadian Spruce, 1st	do.	10	0	0	11	0	0
Do. do. 3rd & 2nd	do.	9	5	0	12	15	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	7	5	0	12	10	0
Flooring Boards 1in. prepared, 1st ..	per square	0	10	3	0	12	3
Do. 2nd ..	do.	0	10	0	0	12	0
Do. 3rd &c. ..	do.	0	5	0	0	10	0

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4$\frac{5}{32}$		—	
Do. Honduras ..	do.	0	0	1¾		—	

COMING EVENTS.

Wednesday, February 5.

SOCIETY OF ARTS.—Mr. Herbert T. Thomas on "Jamaica," 8 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. E. J. Steegmann, M.B., on "Natural Forces," 7 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Royal Mint, Tower Hill, E.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

BUILDERS' FOREMEN'S AND CLERKS OF WORKS' ASSOCIATION.—Ordinary Meeting at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. Nigel Bond, B.A., on "The Work of the National Trust for Places of Historic Interest." 7.30 p.m.

ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW: ARCHITECTURAL SECTION.—Mr. Ebenezer Howard on "Garden Cities," 8 p.m.

CHEMICAL SOCIETY.—Meeting at 5.30 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Mr. Arthur Sidgwick, M.A., on "Cowper," 7.45 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. William Davidson on "Notes on Winchester, Salisbury and Wells and their Surroundings," 8 p.m.

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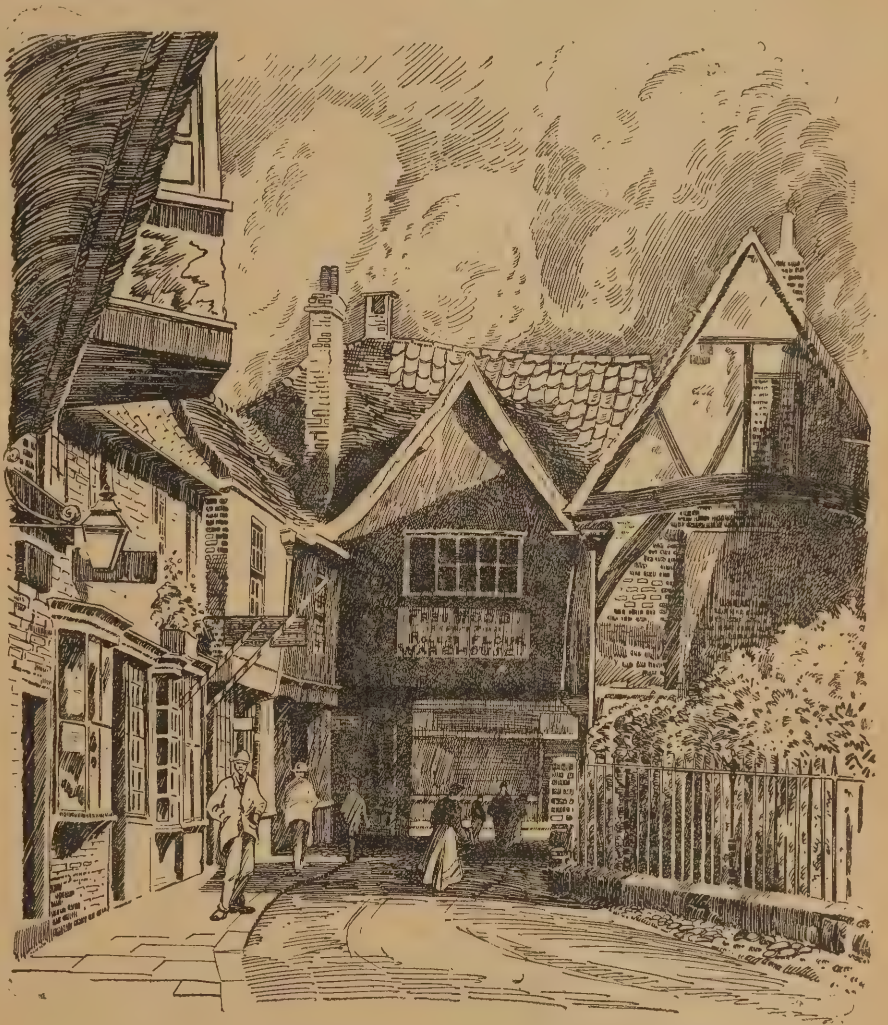
An Architectural Causerie.

Slums after Slums. SOME persons consider that for corporations to clear away slum areas and erect model dwellings on them is merely wasting the ratepayers' money and causing new districts to be made disreputable. This is a familiar view of the case, but it is certainly astonishing to find the Manchester Corporation demolishing slum dwellings at Miles Platting and replacing them with forty jerry-built houses which are said to be almost as unfit for people to live in as the hovels which formerly covered the site. The Town Hall Committee was appointed to enquire into the matter and the result of their investigation is that they call for the resignation of the chief architectural assistant in the City Surveyor's Department. There is sad blundering here, and it does not improve the Manchester Corporation's reputation. It is however significant that the Town Hall Committee recommend that the architectural and the surveying departments of the Corporation shall be separated. We have on more than one occasion deprecated the economy which puts too much responsibility on one man, necessitating his superintendence and direction of so many things at one time, yet at Manchester it seems that this has been the policy freely adopted. As long as the work is done somehow or other, nothing becomes known publicly of the troubles, and it is only when mishaps occur that the folly of this municipal parsimony is seen: and then follows a hullabaloo and recriminations, the officials and not the system being blamed.

The Danger to York Minster. IT is difficult to find valid reasons for the ruthless destruction, or attempted destruction, of valuable and highly picturesque buildings which has occurred again and again in York. The latest example of this spirit was the attempt made to remove the old gateway in College Street, shown in the accompanying drawing. According to a general custom the cathedral close at York was surrounded with walls and entrance was gained by means of four gateways. Of these the threatened gateway in College Street is the only one remaining. Having been treated most severely in the past and still more so during recent years, it now presents a very patched-up appearance. Perhaps it possesses no special architectural merit, but it is certainly picturesque and groups very charmingly with the fifteenth-century college of Saint William hard by. The Corporation, however, who seem incapable of realising that York's great and only distinction is its possession of invaluable antiquities, decided to pull the gateway down to relieve the congestion of traffic in Goodramgate. The result of this proposal would have been a great increase of traffic round the Minster, and especially so towards the eastern portions. Strong representations were made by the Dean and Mr. Bodley, R.A. (the consulting architect to the Chapter), and many others, pointing out that the vibration caused by the great increase of traffic would seriously imperil the safety of the Minster and particularly the east front, which already shows several very ominous cracks. The Corporation, however, were obdurate and actually commenced pulling down the half-timbered cottages to the south of the gateway, preparatory to the removal of the archway itself. At this juncture Mr. Frank Green, a patron of art who takes great interest in local relics, offered to make good the sums already expended on the purchase of the building and to restore it to something like its old beauty, provided the Corporation would promise to devise some alternative route for the new street. This, one is glad to say, has been done, and the new street will be made a little to the south, thus saving the archway and keeping the traffic away from the eastern front of the Minster. But even with this concession the proposal cannot but be regarded as most unfortunate. It is a bad policy at the best to disturb the serenity of a cathedral close with the noise of heavy traffic; it is still more so when that traffic endangers the stability of a structure so universally famous as that at York. Even now, according to a statement by the clerk of works, a passing cart causes a vibration which can be felt to the topmost pinnacle of the south transept, and it must not be forgotten the upper portions of that transept are several feet out of the perpendicular. Although the fragile eastern front, with its huge window, will be avoided by the new route, the same cannot be said for the south transept, for there the traffic will pass close to the base of the porch steps. A great chorus of indignation and protest has been raised, but so far in vain. We can only hope that even yet the municipal authorities will reconsider their proposals and do nothing in any way to jeopardise the safety of a building which is not merely of local but national importance.



OLD GATEWAY IN COLLEGE STREET, YORK. DRAWN BY W. AINSLER.

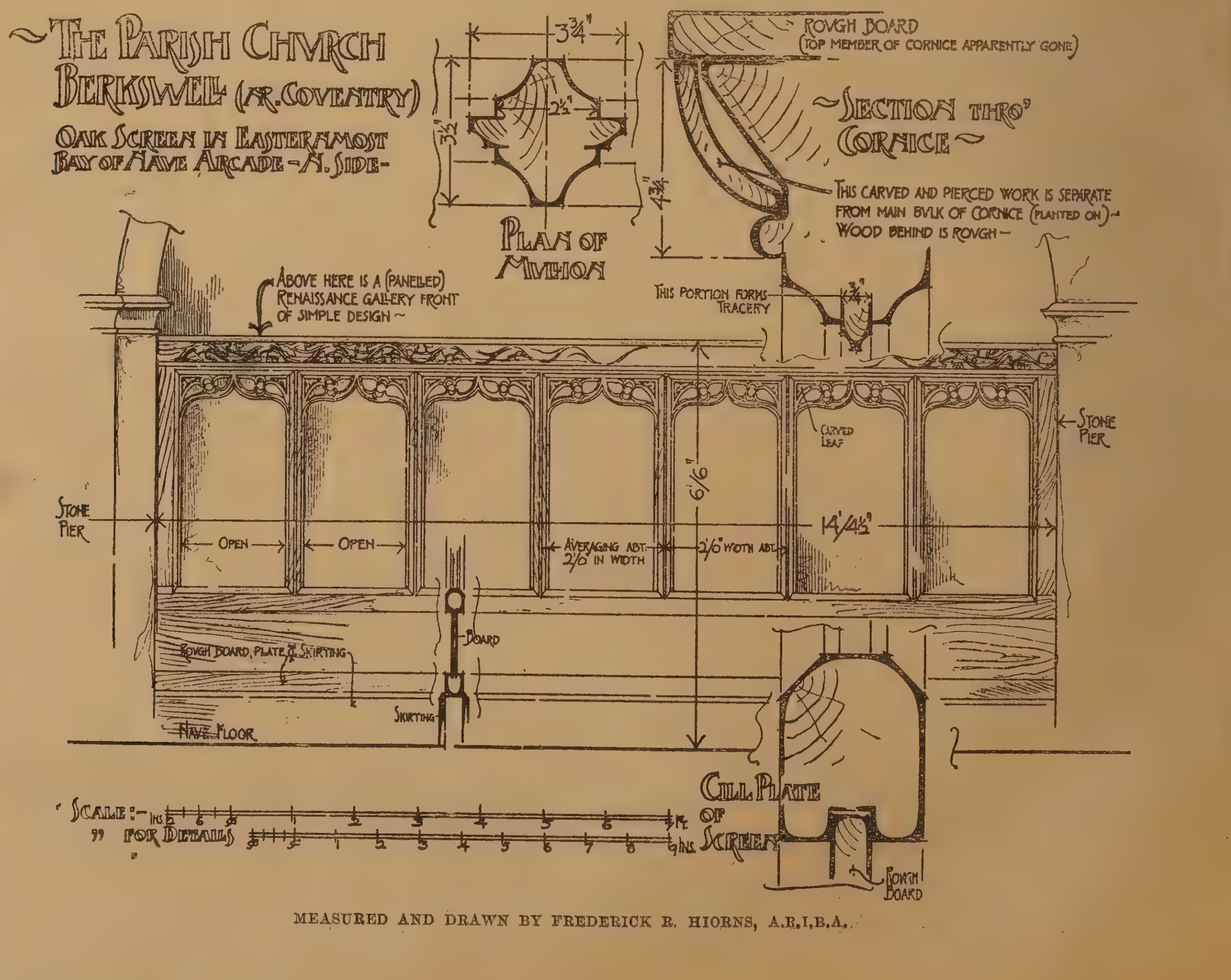
Theatre Fires. IT is so long since a fatal fire occurred in a London theatre that the general public forget this is mostly due to constant and careful supervision and more fireproof methods of construction. Occasionally, however, attention is drawn to these matters, as in the reports of the paper which Mr. Mulholland read before the Playgoers' Club on Sunday evening. Mr. Mulholland expressed approval with the requirement that a portion of the roof over the stage should be of glass, so that in case of fire it would soon give way and draw off the flames from the auditorium, illustrating his point by reference to the two fires at the Grand Theatre, Islington. When the first fire took place there was a heavy concrete roof, and the flames were forced into the auditorium; in the second fire the auditorium was practically untouched. There is more danger of the audience being stifled by smoke than actually burnt: hence the absolute retention of the outburst behind the curtain and the withdrawal there of the smoke and flames should be essential requirements.

THE ARCHITECTURE OF "ULYSSES."

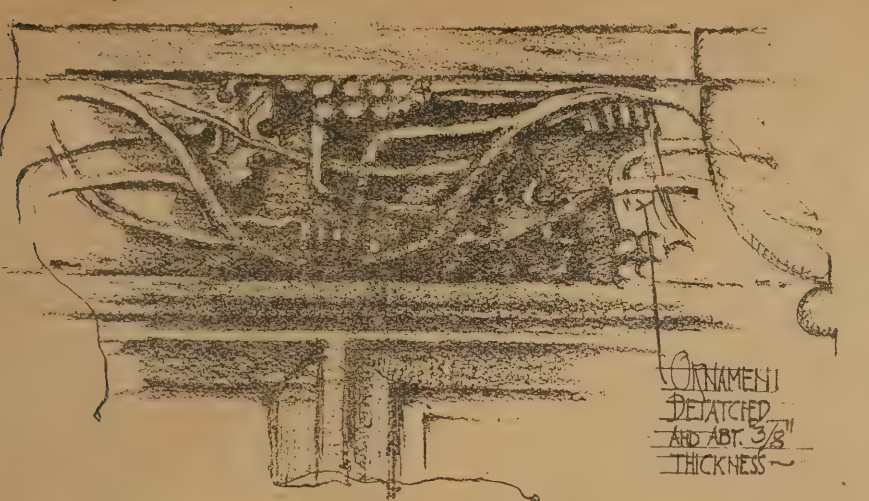
THERE is nothing more characteristic of modern plays than their great and costly settings, and in these the accurate representation of architecture is receiving increasing attention. The most notable examples of recent years have been "Julius Cæsar" and "Herod" at Her Majesty's Theatre and "Coriolanus" at the Lyceum Theatre. At no theatre are the settings so magnificent, or the multitudinous details so carefully considered as at Her Majesty's, and in the production of "Ulysses" Mr. Tree has excelled himself: the more so by reason of the great difficulties attaching to such an archaic play, requiring the widest knowledge and most thorough research in order that the scenes may be as correct as it is possible to have them. We say this because the facts about Mycenæan architecture are but incompletely revealed, though, compared with what was known before the recent wonderful excavations in Crete, they are very considerable. In presenting the architecture of this difficult period Mr. Tree has requisitioned the aid of Professor W. R. Lethaby, Mr. Sidney Colvin, M.A., and Dr. Murray of the British Museum, the two scenes representing the forecourt of Ulysses' palace on the rock-bound isle of Ithaca and the banqueting-hall in the same palace having been carried out by Mr. Harker from sketches furnished by Mr. Lethaby (who, it will be remembered, is professor of design at South Kensington). These are intended to give an idea of "that peculiar system of primitive architecture and decoration the traces of which have lately been unearthed at so many sites of legendary renown in ancient Greece. The researches of modern explorers in this field began with the work of Dr. Schliemann at Troy, Mycenæ and Tiryns. Similar explorations are being actively carried on to-day by English and other scholars, the richest results of all being those yielded by the island of Crete. The style, known generally for convenience sake as the Mycenæan, is supposed to have lasted approximately from about 1500 to 1000 B.C. It differs widely, as will be seen, from the simplicity and purity of the more familiar architectural styles of later Greece. It is far more barbaric, oriental-looking and many-coloured; all surfaces being covered with coloured patterns of a special type or friezes of animals both wild and tame; doors and columns being enriched with embossed plates of bronze, studs and bosses of glass, &c. Professor Lethaby's aim has been not to reproduce precisely any particular extant specimens of this system of decoration (which was applied in the Mycenæan age to all objects and surfaces, both great and small), but to design freely in accordance with the general spirit of the remains discovered."

In point of detail the third scene of the first Act is the more interesting of the two architectural representations. This, the forecourt of the palace, shows towards the right a wooden building about 20ft. high raised on a base of limestone and approached on one side by a few stone steps between enclosing walls. The building forms the living apartments of the women and is open at the front on the lower floor, two wooden columns being spaced between the squarely-treated "piers" at either side. Between the columns hang blue curtains having birds worked in gold upon them, while above the unbroken front of the house is decorated with panels in fresco colours. The two columns are typical Mycenæan, tapering *downwards;* they are decorated with zig-zag bands of colour, alternatively black, silver and red, while the side "piers" are striped with black, amber and white, one horizontally, the other horizontally and vertically. Mr. Evans says in his book on "Mycenæan Tree and Pillar Cult," which is really the only authority on the subject which embodies the recent discoveries made by the author and Mr. Hogarth:—The Mycenæan column in its developed architectural form essentially belongs to woodwork structure. The fundamental idea of its sanctity as a "Pillar of the House" may at times have been derived from the original sanctity of the tree trunk whence it was hewn, and a form in this way possessing religious associations may have been taken over into stonework. But there is also what seems to be conclusive evidence that among the Mycenæans pillar-supports of a very primitive form of stone construction have left their trace on the Mycenæan column in its perfected shape and explain indeed its most characteristic feature, namely, the downward tapering outline which distinguishes it alike from the columns of Egypt and the East, and from those of later Greece. In the Balearic islands examples have been found of a horizontally vaulted chamber deriving its support from a column the upper part of which consists of cross slabs gradually increasing in size so as to present the appearance of an upwardly widening pillar and capital: the object of which is to meet the inwardly inclining walls of the chamber and form a kind of Tirynthian passage all round. This is a simple explanation of the "Pillar of the House."

Some conception of this ancient cult among the Mycenæans is of great aid in studying the architecture. In these early days the pillar itself was supposed to contain the divinity, just as among other primitive races the belief existed that the rude stone monuments placed over graves were actually the dwelling-places of the ghosts of the dead. In Crete the worship of the pillar was closely connected with that of sacred trees and there is this connection between them —that the tree itself could be converted into a column or tree-pillar which still retained the sanctity of the original; and moreover was emblematical and symbolical as supporting the structure, though this was not always the case, as the columns were sometimes set outside the building and possessed rayed terminations (it is interesting in this connection to note that the two columns in front of Solomon's temple — "the Stablisher" and "in Him is Strength"—were placed there as symbols of the endurance of Jehovah, though it is doubtful whether they actually supported the roof beams of the porch). Among the features in Mycenæan art none are more noticeable than the double-headed axe and the "horns of consecration,"



MEASURED AND DRAWN BY FREDERICK R. HIORNS, A.R.I.B.A.



which, as the name implies, refer to the horns of slaughtered animals used in sacrifice, and the representation of which constantly recurs in decorative form: while as regards the double axe, it is not without interest to observe that "labrys" was the Lydian name for the Greek πέλεκυς, or double-edged axe, so that the wondrous Labyrinth of Crete was the "House of the Double Axe," or the "House of Zeus."

It should be borne in mind that the great Zeus, God of the Double Axe (the electric equivalent of which, by the way, flashes so brilliantly in the prologue of the play), was the divinity worshipped in this past age. The tomb of Zeus on Mount Dikta was shown in Crete down to at least the fourth century of our era and it was the preservation of this piece of primitive religion that gained for the Cretans the distinguishing epithet applied to them by Kallimachos and St. Paul. In Crete the pillar cult and the worship of the fig-tree were universal, the pillar, with a crude representation of a double axe cut on each of its stones, serving to impersonate the mighty Zeus. This worship had a particular influence on the architecture and we see that the pillar was looked upon as the "Pillar of the House," like the Hathoric columns of Egyptian temples or the sacred Dad or Tat pillar with its fourfold capital that was supposed to support the four quarters of the heavens.

Perhaps the most interesting part of the block of women's apartments shown in the play is the roof. This is composed of three rows of round timbers laid at right angles to one another, so that the middle row shows only its ends at the front, which give the effect of a very crudely-moulded cornice: an exact representation of which is seen in the famous tympanum relief of the Lions' Gate at Mycenæ, where between the sacred animals is set a typical Mycenæan column supporting a fragment of the roof beams.

The roof timbers project about 3ft. at each side and are supported by struts which stand out from the front of the building at an angle of about 45 degs.: but as to what is their exact construction one cannot say, though it appears that they are tenoned in position. Above the roof a low dome pierced with holes excites the curiosity (it apparently serves as an outlet for the smoke from the fire within the room), while above it is a square tower wherein men may keep watch over the approach to the palace. To the right of this block is a covered way smothered with creepers and fruit vines, through the wall of which access is obtainable to the orchard and the town beyond. This lean-to, for it is nothing more, has a most curious ridge decoration which recalls the "guttæ" of the later Greek period, when, however, they were placed at the *edge* of the roof. The posts supporting the roof are painted with alternate black and white bands which might appear to be an adapted form of the "horns of consecration," but are more probably a decorative treatment of the mortice and tenon joint, like that in the fresco discovered at Knossos.

To the left of the women's quarters runs a low battlemented wall of ashlar masonry, having a kind of platform for the archers behind it decorated with a band of what might be called a prototype of the egg and dart ornament: beyond are the hills of Ithaca. Within the space thus enclosed is a courtyard and on the left side one sees the corner of a pedimented wooden building having the characteristic tapering pillar, with surface decorations in gilt, silver and colours.

The other architectural scene in the play is that of the banqueting-hall inside Ulysses' palace: and of this so much need not be said, for there are many similar features which have already been described. The apartment is oblong and at each side of the centre is a decorated column having a roughly floriated capital, Egyptian in feeling, while the roof is hung with decorated cloth having a black and white pattern, with strips of green and yellow extending from pillar to pillar and thence to the sides of the room. In the fragments of fresco discovered at Knossos a black and white checker pattern is seen which is doubtless taken from stonework construction and probably copied from Egypt, though the builders of the Palace were quite capable of producing stucco imitation of masonry: and it is just possible that ceilings may have been plastered and decorated somewhat similarly.

Around the top of the walls in the banqueting-hall is a deep frieze decorated with Mycenæan scrolls in red, with green diamonds between them, while the remainder of the wall-surface consists of a great fresco painting having a blue ground whereon brown lions leap, shot through with great arrows, other arrows, and birds, also being included in the decoration: altogether a very bold and effective scheme. To the left of the banqueting-hall a few steps lead down from Penelope's private apartments; on the opposite side is a door covered with bright metal; and at the back is the main entrance to the hall surmounted by a great representation of the sacred tree with a smaller tree on either side below its branches.

These then are the two scenes. They are both striking in conception and barbarously grand in effect, and not the least interesting features in them are the numerous details which were afterwards to be developed and perfected by the later generations of Greeks.

The Nottingham Architectural Society held its annual dinner last week. Mr. A. Marshall (president) was in the chair, and Mr. A. W. Brewill (vice-president) in the vice-chair.

The Oak Screen in Berkswell Church, near Coventry, shown in the accompanying illustrations by Mr. Frederick R. Hiorns, A.R.I.B.A., is one of several in the nave arcading of this interesting old church, some particulars of which were given on p. 295 of our issue for December 11th last.

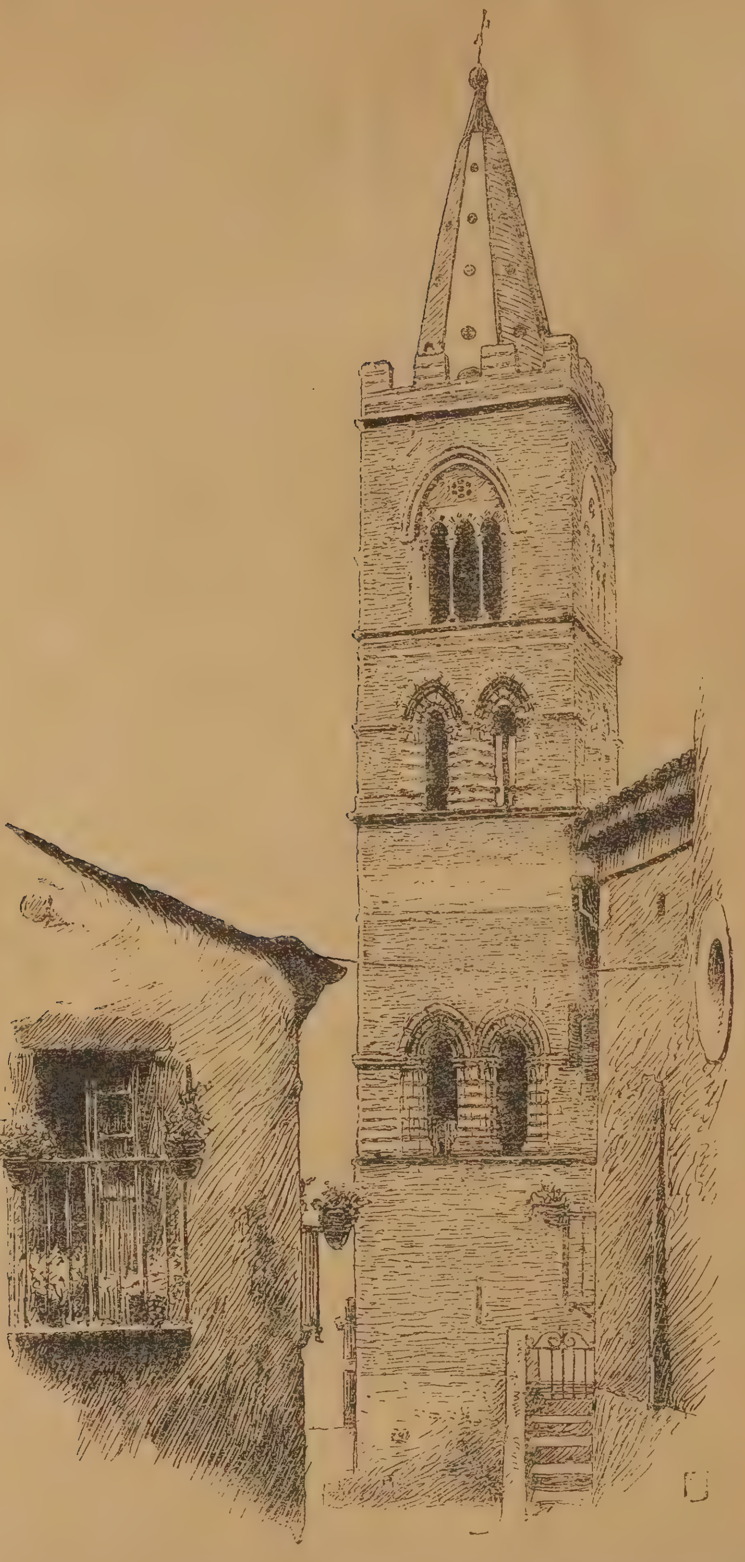
SICILY AND ITS ARCHITECTURAL MONUMENTS.—III.

By F. HAMILTON JACKSON, R.B.A.

(*Continued from p.* 411, *No.* 364.)

THERE is, however, another and perhaps more interesting route to Catania than that described in the last article, namely, by the Circum Etnea line, which starts from Riposto near the station on the main line and returning northwards to Piedimonte passes round the mountain on the landward side, affording most picturesque views from its slopes over the plains and towards the mountain chains of the interior, and passing many places of considerable interest both from the historical and artistic side. The line runs at first up the valley of the Minissale along the slopes of Etna, and looking across to the lesser hills which divide it from that of the Alcàntara. Before reaching Linguaglossa the remains of the eruption of 1566 are traversed, now cultivated for the most part. Here the land is covered with vineyards, while a little further the best hazelnuts in Sicily are grown. On the other side of the valley highly-placed towns look picturesque on their lofty sites, almost like towns from the backgrounds of mediæval pictures. Near Mojo station the lava descended in 1879 almost as far as the Alcàntara, which runs along the valley below, and the people of Mojo, which lies on the other side of the river, became alarmed and brought out an image of St. Anthony, their patron saint, in procession to stop it. This lava is not yet disintegrated at all, and presents a very ugly appearance, something like the slag of a smelting furnace on a large scale, the only thing growing on it being a giant spurge. Near Mojo is an interesting little Byzantine church of the seventh or eighth century. Square in plan, with a flat cupola roof and a small apse on each of three sides, the entrance is on the fourth. This is said to be the only Byzantine church in Sicily, above ground, anterior to the Saracen invasion, and curiously enough the peasants' name for it is "La Moschea."

Randazzo lies at the top of the valley of the Alcàntara, and though it contains but 8,500 inhabitants is a place of some importance. It was founded by a Lombard colony and was surnamed Etnea by the Emperor Frederick the Second as being the nearest town to the crater of the volcano. The manners of the people are rough and the town still preserves a severe and warlike appearance worthy of its mediæval origin. The Aragonese kings often spent the summer here, thinking the air healthy. Perhaps the severe appearance of the town is partly owing to the use of lava for building relieved by plaster and whitewash in the less constructional parts, a mode which chastens the exuberance of the later Renaissance with advantage, but does not so well set off the earlier Gothic building. The choir of the church of S. Maria dates from the thirteenth century, and the side walls from the fourteenth. It towers up from the street like a fortress with a machicolated cornice. The ornament is based on Byzantine data roughly cut and with the addition of details which are Norman (the billet moulding and other details) and Renaissance (vases bearing flowers and arabesques on pilasters). The campanile is a curious modern concoction of the confectionery order put up in 1873, when the church was restored. The name of Petrus Tignosus appears in an inscription as the first architect. The interior has an arcade of great lava columns with roughly-cut caps of early fourteenth-century type, the walls are whitewashed and the roof covered with particularly abominable frescoes, which, like the pictures above the side altars which vie with them, are the production of local talent and date from the seventeenth century, when the interior was recast. The large church of St. Martin at the other end of the town is of the fourteenth century. It has a fine tower of lava with courses of white stone here and there and the walls finish with an interesting corbel table bearing some resemblance to the machicolations of S. Maria. Opposite is the old Ducal Palace, now a prison, still bearing the spikes on which the heads of criminals were exposed. Many of the houses appear to be mediæval, quite small places with pointed



CAMPANILE OF S. MARTINO, RANDAZZO. DRAWN BY F. HAMILTON JACKSON, R.B.A.

windows on the first floor and a row of quatrefoils below them, as well as the larger houses of more wealthy citizens, and there are also a good many palaces of considerable importance and of different dates. In the main street are several very picturesque seventeenth-century shops consisting of a full-centred moulded arch, sometimes with carved keystone or caryatid brackets, beneath which are counters on each side of the entrance, sometimes supported by consoles of robust outline and always projecting well beyond the wall face with a boldly-moulded edge of two or three members. There is also some good ironwork in the shape of fanlights of late date. The church of S. Nicolò stands in a little piazza to the side of the main street approached by a passage across which a thirteenth-century house was once thrown. The arches which supported walls and floor still remain and a portion of the front wall, pierced by a graceful two-light window with twisted shaft. The church contains some sculpture ascribed to the Gagini, almost the only Sicilian sculptors known to fame; a family which came from the north of Italy and after three generations returned to its birthplace. The tradition of Florentine design is visible in their work and occasionally the execution of it, but very occasionally. The dome of S. Nicolò was in fragments on the floor and extensive works of reparation were in progress. The façade is an example of what has been said about the chastening influence of the use of lava in building upon the licence of curve used by the later Renaissance architects.

From the railway the retrospect of Randazzo is charming, and an artist might do worse than stay in the town for some time, though the hotel is rather primitive and it would be best to make a bargain about prices before commencing a lengthened stay, since the argument was used to us that the small number of visitors made it necessary to charge those who *do* come highly! The line still ascends until Brontè is reached, passing Maletto on the way, a small town with an old castle, below which lies the suppressed Benedictine monastery of Maniacum, founded in 1174 by Margaret, mother of William II. Maniace, the town near, where the steward of Viscount Bridport lives, takes its name from the Greek general Maniaces, who also built or recast the castle of Syracuse. Here in 1040 he defeated a large army of Saracens, aided by Harold Hardradr and his Norwegians and a contingent of Normans. Brontè is said by some to be a very ancient town, while others state that it has been built since the time of Charles V. The line circles round it on a higher level, almost as if on the upper seats of an amphitheatre, over the lava of 1651, which descended close to Brontè. Its name is said to come from one of the Cyclops of Vulcan's forge, and to Englishmen it is interesting as being the place which gave the title of Duke of Brontè to Nelson. This is a good point of departure for lofty Troina, 1,000ft. higher than Castro Giovanni and the loftiest of the larger towns of Sicily, where Count Roger and his young wife Judith were besieged by Greeks and Saracens in the bitter winter weather when they had but one cloak between them. The views are now over the beautiful valley of the Simethus and many lava flows are crossed before arriving at Adernò, the most important sub-Etnean town after Catania and Aci Reale. Here the famous temple of Adrano stood, guarded by more than 1,000 dogs. The city was founded by Dionysius of Syracuse, and it flourished under the Saracens. Roger fortified it, erecting a castle of which one tower is thought to remain, though recent discoveries have made this doubtful. Here his niece Adalisa took the veil in the convent of Santa Lucia, which he founded in 1157. It is said that until the eighteenth century the women of the people used to dress in the Greek fashion with a long white chlamys, and the nobles used the costume of Spanish gentlemen of the sixteenth and seventeenth centuries. Truly a picturesque people amid picturesque surroundings in those days! Below in the valley are the remains of a Roman aqueduct. The line now descends rapidly to Bianca villa, which is inhabited by the descendants of Greeks, Albanians and Epirots who took refuge here from the Turks in the fifteenth century. Paternò, seven miles further on, is a town said to have been founded by the great Count, who built the castle and gave it as a dowry to his daughter Flandrina when she married Henry the Lombard. Antique sarcophagi and sepulchres discovered here prove it to be older, and it seems probable that it is on the site of the Siculan city of Hybla Minor, since two arches of an ancient bridge are still standing and the road from Catania to Centuripæ passed by Hybla. Motta S. Anastasia has an ancient Saracen castle something like La Cuba at Palermo, restored by the Normans, and from hence to Catania is but a short distance.

Catania, which after Palermo is the most populous city in the island, is the seat of a bishop, of a court of appeal, and of a university, which was founded in 1444 by Alphonso of Castile. Being a prosperous town and having suffered, as it has, from earthquakes and eruptions, there are very few antiquities of interest left, but among the few are two or three which make it worth while to stay there for a short time, and the history of the place demands a few words. The cathedral is dedicated to St. Agatha, who was martyred in 93 A.D. under Diocletian as some say, or as others assert under Decius in 252 A.D. The veil with which she is said to have covered her breasts is now considered the most powerful talisman of the city against the flowing lava. Her chapel is to the right of the altar and contains her shrine and the half-length statue of her, bearing the crown given by Richard Cœur de Lion. These are most elaborate and beautiful examples of the goldsmith's art of the fourteenth century and were made by Giovanni di Bartolo of Siena. The shrine is surrounded by niches filled with statuettes and is also decorated with jewels and enamel. The apses of the cathedral are decorated externally with a pointed arcade without mouldings; they and part of the eastern transept are the only parts of the original cathedral founded by King Roger in 1091 still existing unaltered. The six granite columns in the present façade came from the Greek theatre, from which King Roger seems to have obtained most of his building materials. The fountain of the elephant in front of the cathedral consists of a figure of an elephant in lava, of extremely ancient date, bearing on its back an Egyptian obelisk of granite which was found on the site of the circus, surmounted by an iron cross, crown and lilies, on a base of marble with figures of the rivers Simethus and Amenanus. The doorway of the church of Santo Carcere, a fine Greco-Norman piece of work, was taken from the cathedral, to which it belonged, after the earthquake of 1169. It is said that St. Agatha was martyred here, and they show her cell and the print of her foot on a piece of lava. The only other mediæval monument is the Castel Ursino, built by Frederick II., at both sides of which the lava flowed in the eruption of 1669. It is square with round towers at each angle and one extra flanking the entrance, covered with a sort of bombproof roof from which a little dome rises. The whole building is now plastered and no details show.

The Greco-Roman theatre from which Roger took the materials for his cathedral is within the precincts of houses built upon portions of its walls. The seats, of which only twenty-six rows remain, are hewn out of tufa and covered with limestone slabs, and have still a few pieces of the marble which overlay those *in situ*. Part of it is underground, and the stage, which probably exists under other houses, has not yet been excavated. Of the amphitheatre still fewer remains exist, a few arches in the Via Archibusieri, which is perhaps scarcely to be wondered at, since as early as 498 A.D. a decree was issued by Theodoric allowing the citizens to use it as a quarry wherewith to repair the walls and other buildings damaged by earthquake and the barbarians. Its length was 138yds., the breadth 116yds. Near to it are a few remains of the Greek aqueduct, which once brought water from below Licodia, seventeen miles away.

The modern town has broad streets as well as squalor and dirt, and the florid belfries in the baroque churches which frequently rise at the end of a street contrast strikingly with the straight lines of the street fronts. The Via Stesicoro Etnea, the longest and most important, starts from the Piazza del Duomo and passes several piazzas which contain the University and Municipio and the Prefecture, leading to the Villa Bellini, the show-garden of Catania. Two other places must be mentioned, the Roman bath which lies under the Carmelite church "All' Indirizzo," and is almost complete, and the suppressed Benedictine monastery of S. Nicolà with two large courts, now used for barracks and for scholastic purposes. The immense unfinished façade of the church, which possesses an organ which is one of the finest in Europe, looks upon a dreary and squalid piazza.

The plain of Catania was the spot in which the first cities of the Sicanians were built, and here the first historical ideas of Sicily commence with Xutho, son of Æolus, king of the Ephestads or Æolids, called by the Sicanians with his brothers to govern them. This was sometime before the Greek epoch began with the Trojan war.

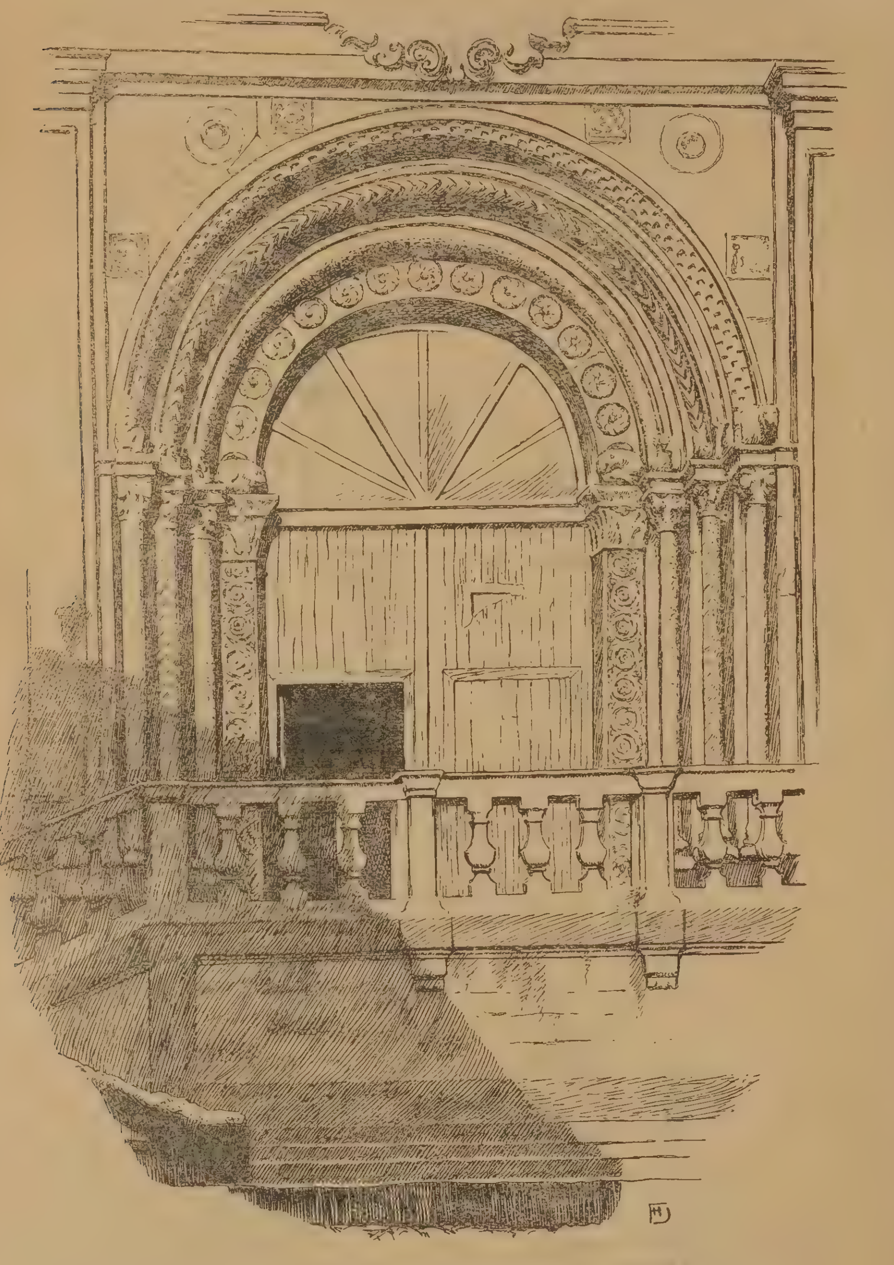
Catania was the centre of Sicanian culture, and here was the great temple of Ceres, as celebrated as the Ceres of Enna. The festivals of the Catanian Ceres, called Ambarvalia, preceded if they did not surpass in fame the Eleusinian mysteries. The sixth century B.C. was for Catania a century of splendour and liberty in which it rivalled Syracuse and Agrigentum. It was enriched with temples, it had a hippodrome for Olympic games, celebrated the most solemn Bacchic feasts in all Sicily, had a Naumachia for naval shows and a theatre for comedy and tragedy, an Odeum for music, a Basilica, public granaries, a mint and an armoury. The gymnasium and academy were then the most celebrated in Sicily. Here Stesichorus lived, the great poet who invented the strophe, antsitrophe and epode of the theatrical chorus, and the forms of epithalamium, elegy and hymn to celebrate the glory of heroes, of poets and of his country. Here too lived Charondas the legist whose laws for Catania were adopted by many of the cities of Sicily and Magna Græcia, and to whom the glory of establishing free education is due, whose respect for law was so great that having unwittingly

PASSAGE LEADING TO S. NICOLO, RANDAZZO. DRAWN BY F. HAMILTON JACKSON, R.B.A.

transgressed one of his own laws by entering the Forum armed while the Senate was deliberating, the penalty for doing which was death, he turned his own arms against himself and fell dead. In 474 B.C. Hiero I. took the town, removed the citizens to Leontinoi, colonized it with 10,000 Syracusans and Peloponnesians, changed its name to Ætna and died in it. So wholesale were the methods of conquest in those days! This was the first of several conquests of Catania by the Syracusans, and the city also suffered much at the hands of the Romans during the civil wars, although at first it prospered under their sway and became one of the most populous towns of the island. Reduced to insignificance during the early middle ages, and destroyed by the troops of Henry VI., the Suabian, it was restored and fortified by his son Frederick II., and under the Aragonese sovereigns of the fourteenth century was the usual residence of the Court. Since that time, except for the revolutionary disturbances of 1848 and 1860, it has had more to suffer from earthquakes and eruptions than from the fury of man.

(*To be continued.*)

The Queen Victoria Memorial Fund now amounts to about £189,000.



DOORWAY, OF SANTO CALCERE, CATANIA. DRAWN BY F. HAMILTON JACKSON, R.B.A.

Law Cases.

A Case affecting Verandas.—At the Blackpool Police Court recently Messrs. Robert, William and Thomas Field, builders, were summoned by the Corporation for an alleged breach of the bye-laws. They are the owners of 28, Dickson Road, part of which was a lock-up shop. In May last year a plan of a veranda was submitted to the Corporation. The plan was disapproved but the veranda was built. It was 8ft. above the street and 15ft. long. Richard Bamber, building inspector, held that a veranda was a building. Defendant's counsel contended that if this were so, then there were other verandas which projected as far as the one in question. He asked how it could be urged that they had extended a building beyond the front when the same was a veranda. The Bench found that though the veranda was a building, the written permission of the Corporation was not necessary for construction. They therefore dismissed the case.

The Tapestry Case.—The appeal case of *Leigh and Others* v. *St. John Stewardson and Others* came before the House of Lords on Thursday last. This was an appeal relating to seven tapestries in the drawing-room of the mansion-house at Luton Hoo, Bedfordshire. Mr. Justice Byrne held that they were fixtures, but his decision was reversed by the Court of Appeal (as reported in our issue for February 13th, 1901). John Gerard Leigh, of Luton Hoo Park, who died in 1875, bequeathed to his wife Madame de Falbe all his furniture, &c., and personal estate excepting leaseholds for her absolute use and benefit, and bequeathed to her all his freehold, copyhold and leasehold estates for her life, and after her death to his heir-at-law. Before 1886 Madame de Falbe affixed the tapestries, the subject of the appeal, to the walls of the drawing-room. Mr. Justice Byrne held that they were fixtures and formed part of the mansion, and could not be removed by Madame de Falbe's executors. The Court of Appeal, however, held that they were chattels belonging to the estate of Madame de Falbe, and reversed the learned judge's decision; and this view of the case was upheld by the House of Lords last week in dismissing the appeal. The Lord Chancellor said the tapestries were placed over stretched canvas affixed to the wall by wooden battens. He did not know of any other mode by which they could—one was 14ft. long—be placed on the wall. They could easily be removed; in fact they had been removed without any disturbance to the wall. These tapestries were pictures in another form, and it would be extraordinary if they were intended to be dedicated to the house. He was of opinion that they did not pass with the house for the benefit of the inheritance.

An Ancient Lights Case.—The case of *Parker* v. *W. F. Stanley & Co., Ltd.*, came before the Chancery Division of the High Court of Justice last Saturday. The plaintiffs in this action carry on business as photographers at 288, High Holborn. When they first entered into possession, in 1890, the studio and gallery, a one-storey building at the rear of the premises, was lighted by a number of skylights which were ancient lights. The plaintiffs subsequently slightly altered the pitch of the roof of the building and enlarged the skylights over the studio, but they darkened or obscured the skylight over the portion of the building used as a dark-room. To the west of the plaintiffs' premises is a long strip of land about 15ft. wide, which was formerly partly bounded on the western side by an old building about 33ft. high, pulled down in 1885. In February, 1901, the defendants commenced building operations on the site of the old building demolished in 1885, and since the issue of the writ in this action have raised their building to a considerable height above the line of this old building, whereby the plaintiffs complained that the access of light to their premises was seriously diminished. Mr. Justice Farwell in delivering judgment said that there could be no doubt that when the plaintiffs took the premises in 1890 the skylights were ancient lights. As regards the dark-room, abandonment had been pleaded, but he could find no evidence to support the plea. The fact that the plaintiffs had darkened or obscured the skylight was not sufficient; the room might be required at any time for other purposes. Then, with regard to the studio, the old skylight had been replaced by what was practically a glass roof. But that new glass roof covered the place occupied by the old window, and their right of ancient lights had thus been preserved, although, of course, it only applied to that portion of the glass roof formerly occupied by the old window or skylight. The defendants had raised their building several feet above the line of the old building which formerly stood on the site, and after hearing the evidence his Lordship was clearly of the opinion that the access of light to the plaintiffs' premises was thereby materially diminished. Photographers required, and reasonably required, special light, and since the judgment in *Warren* v. *Brown* (1902, 1 K.B., 15) the plaintiffs were entitled to complain that they were injured by the defendants' buildings in the conduct of their photographic business, even if that business had not been carried on in the premises for twenty years. The parties had not been able to come to any terms, and consequently he was constrained to grant a mandatory injunction, but it would apply only to the additional obstruction caused by the defendants' new buildings as compared with the old buildings that formerly stood on the site. He thought the parties ought to be able to arrange between themselves what form the necessary alterations should take.

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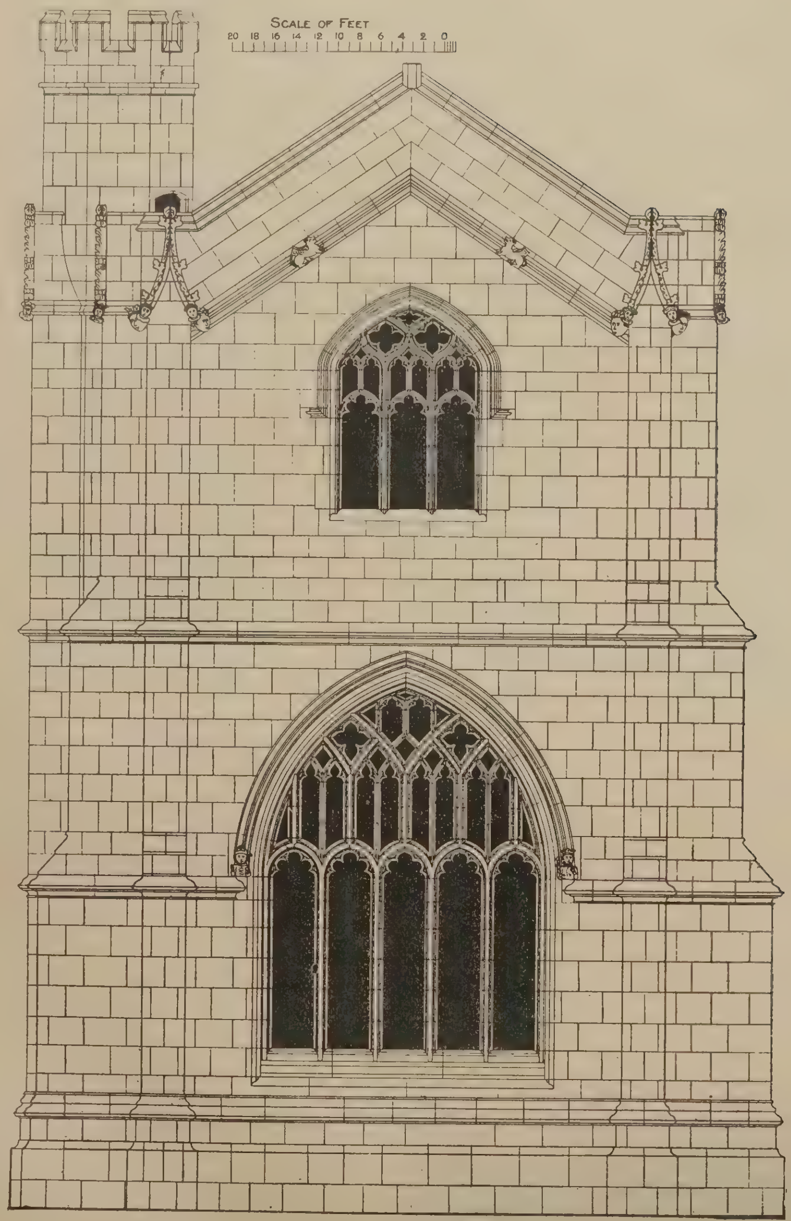
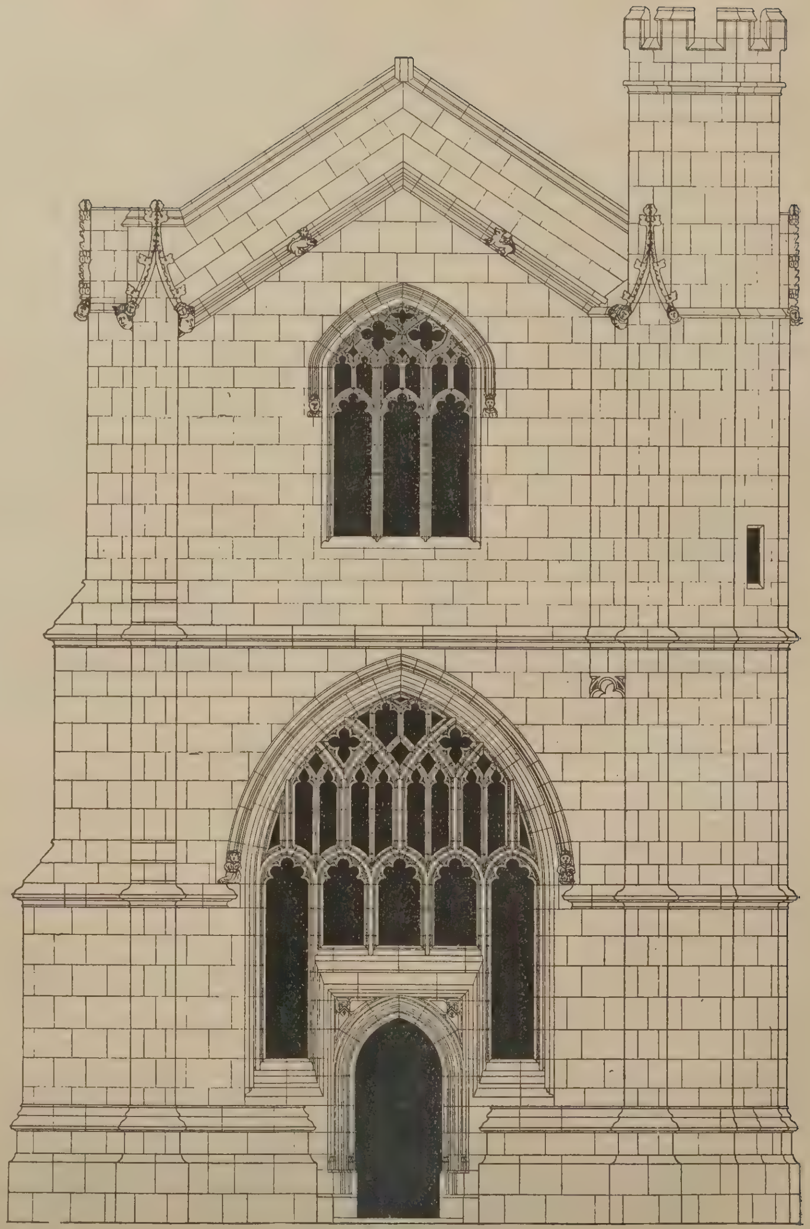
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, February 12th, 1902.



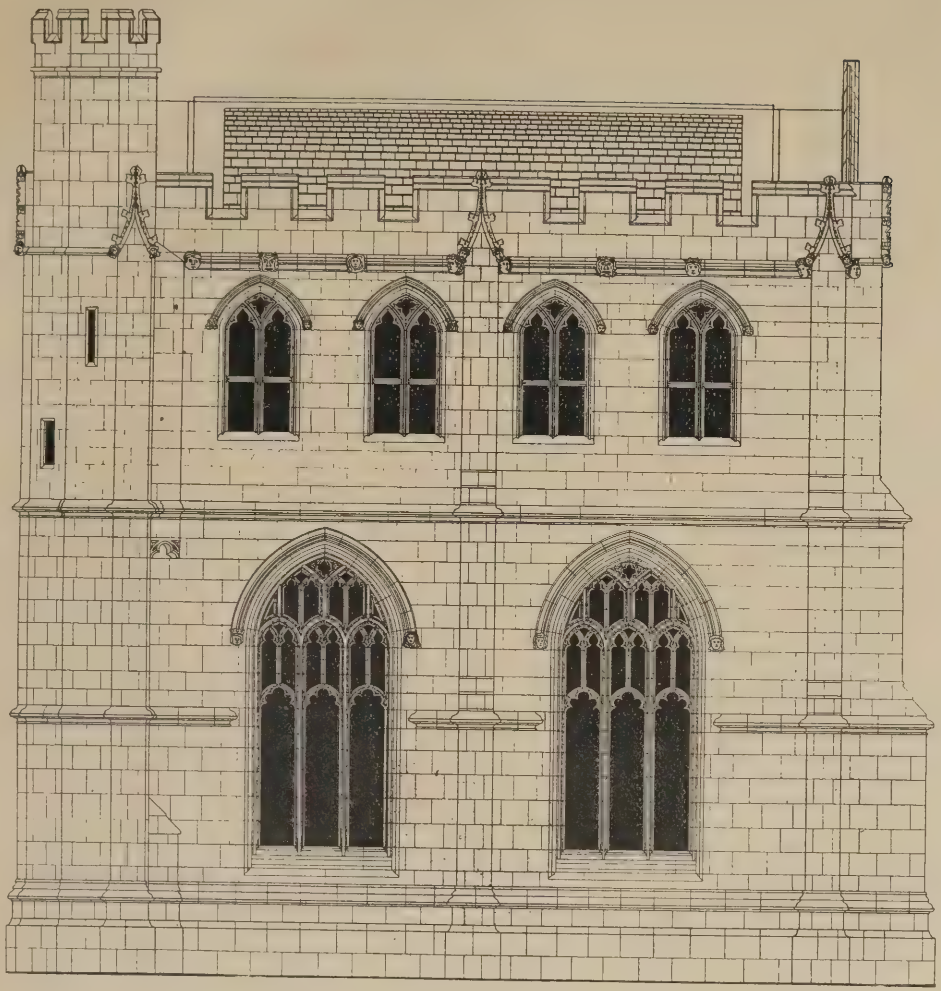
EAST ELEVATION.



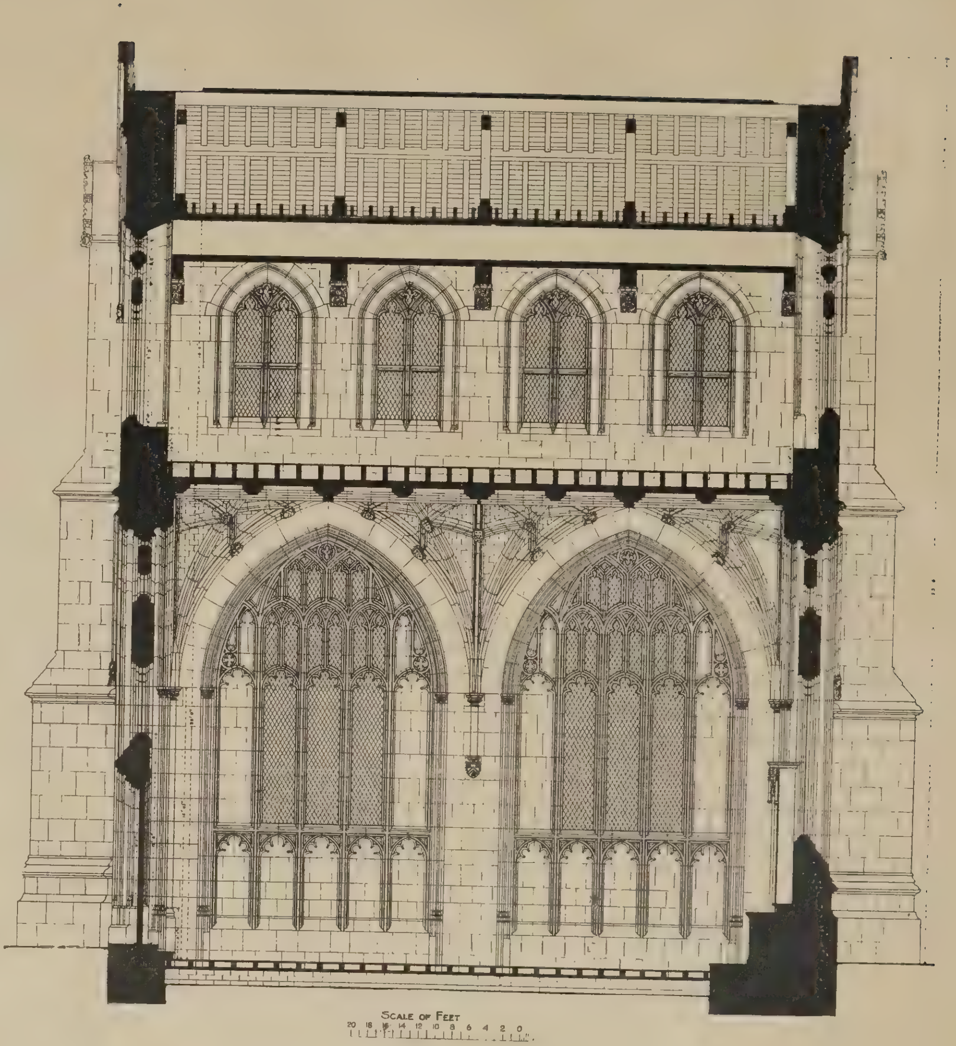
WEST ELEVATION.

WINCHESTER COLLEGE CHANTRY CHAPEL. Measured and Drawn by ARTHUR H. JOHNSON.

Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.
Wednesday, February 12th, 1902.



SOUTH ELEVATION.



LONGITUDINAL SECTION, LOOKING NORTH.

WINCHESTER COLLEGE CHANTRY CHAPEL. Measured and Drawn by ARTHUR H. JOHNSON.

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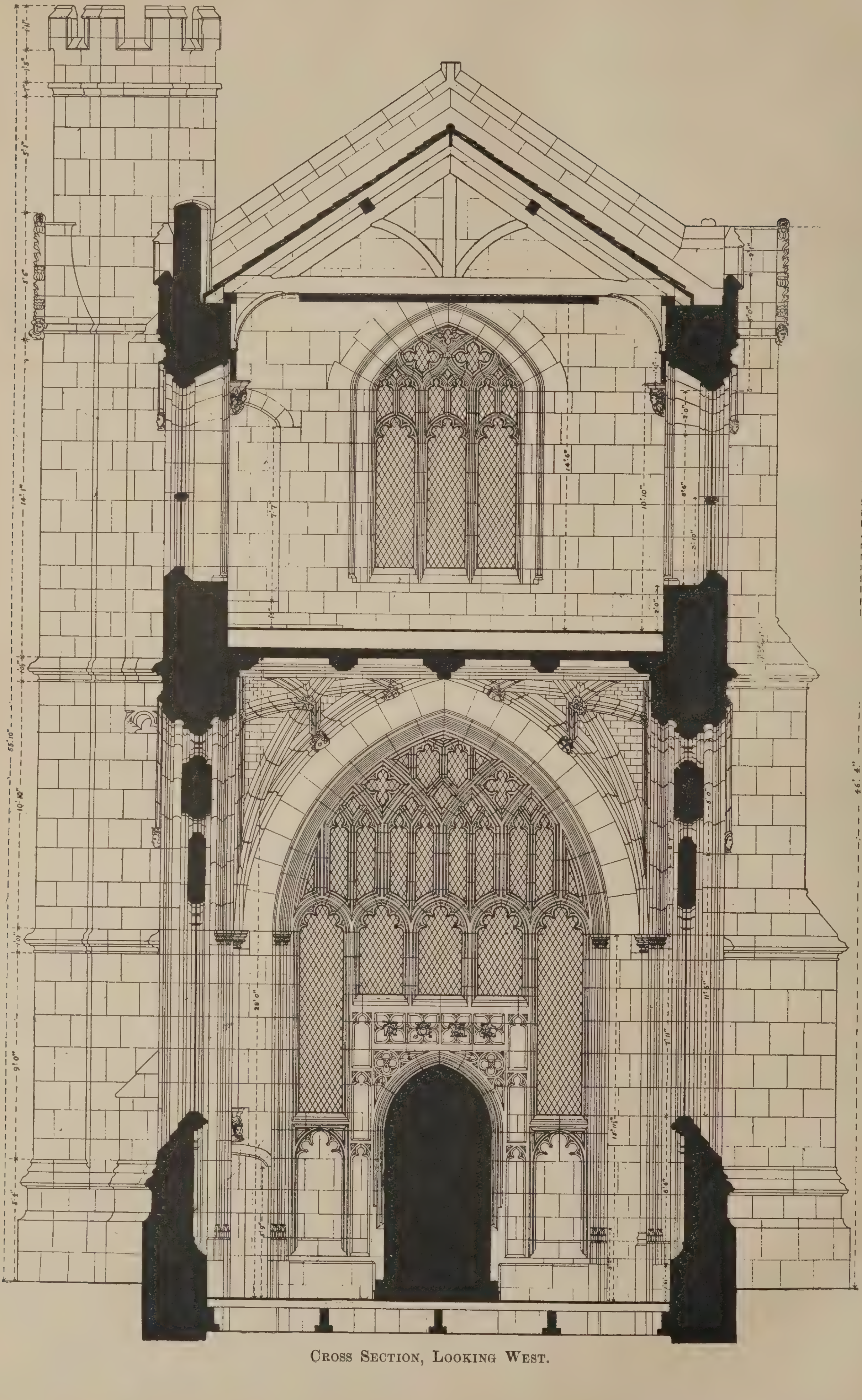
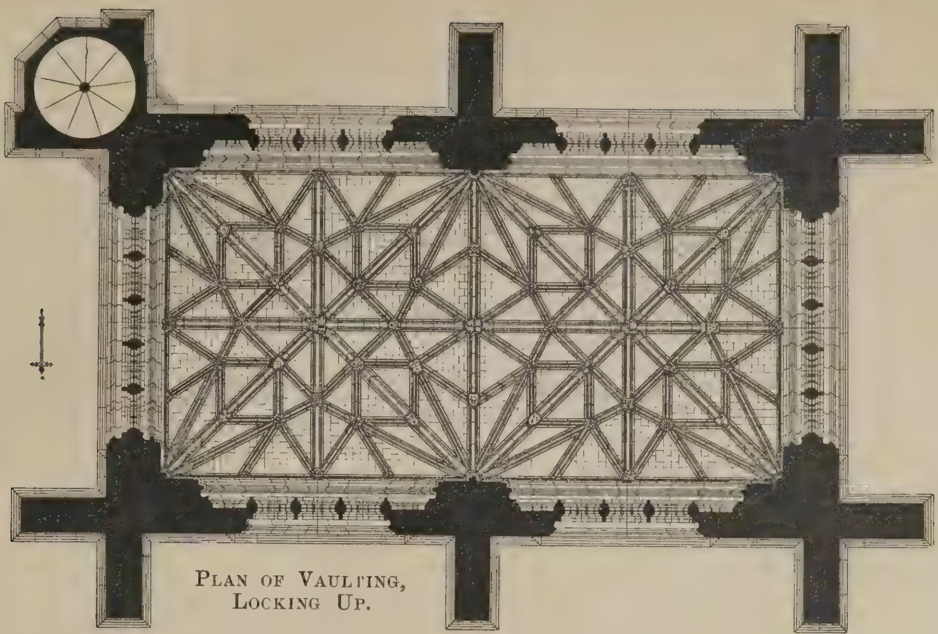
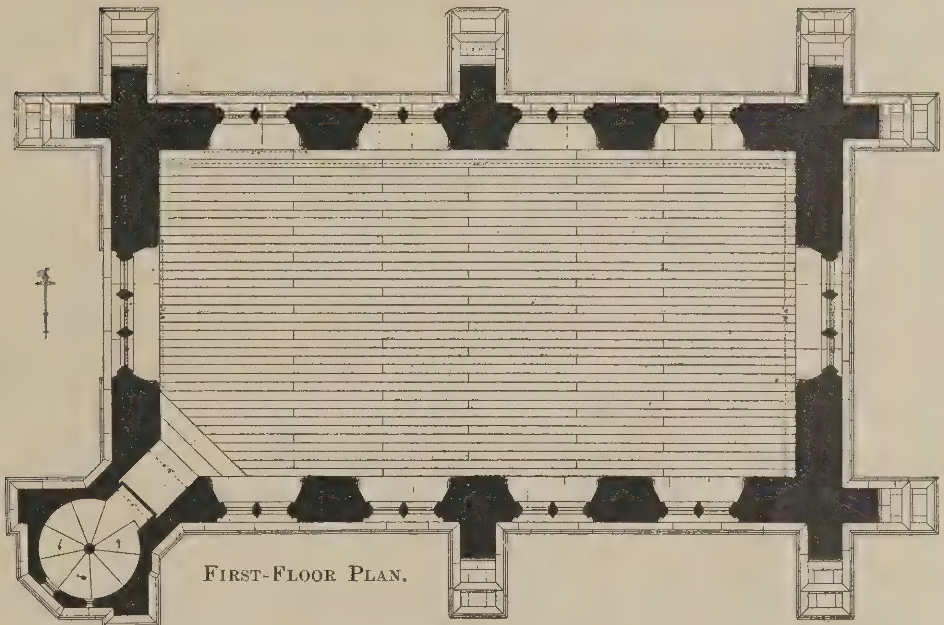


Cross Section, Looking West.

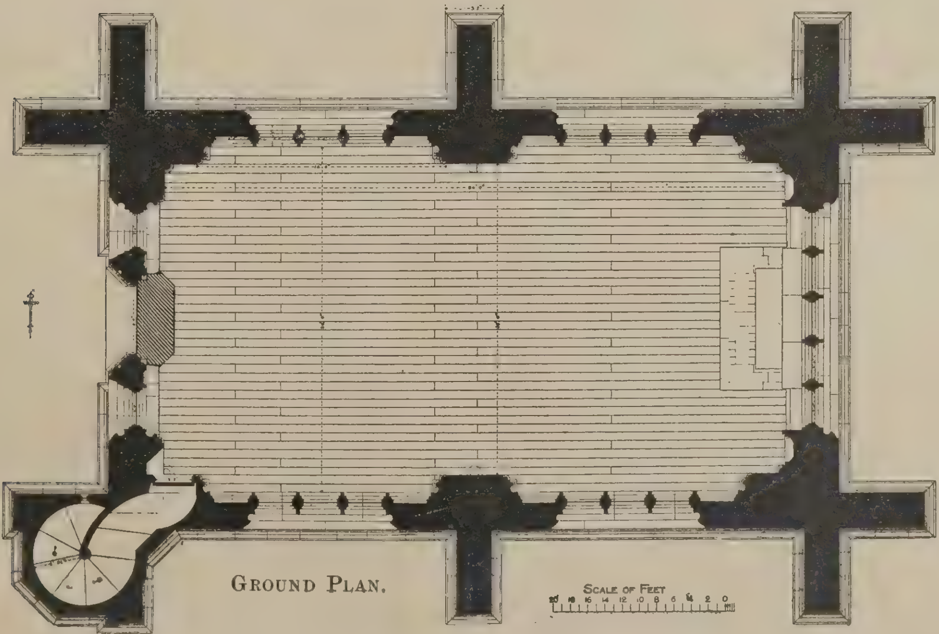
WINCHESTER COLLEGE CHANTRY CHAPE



PLAN OF VAULTING,
LOCKING UP.



FIRST-FLOOR PLAN.



GROUND PLAN.

Measured and Drawn by ARTHUR H. JOHNSON.

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Bricks and Mortar.

HORISM FOR THE WEEK.

ilt by that only law, that use be the suggester
of beauty,
thing concealed that is done, but all things
done to adornment.—CLOUGH.

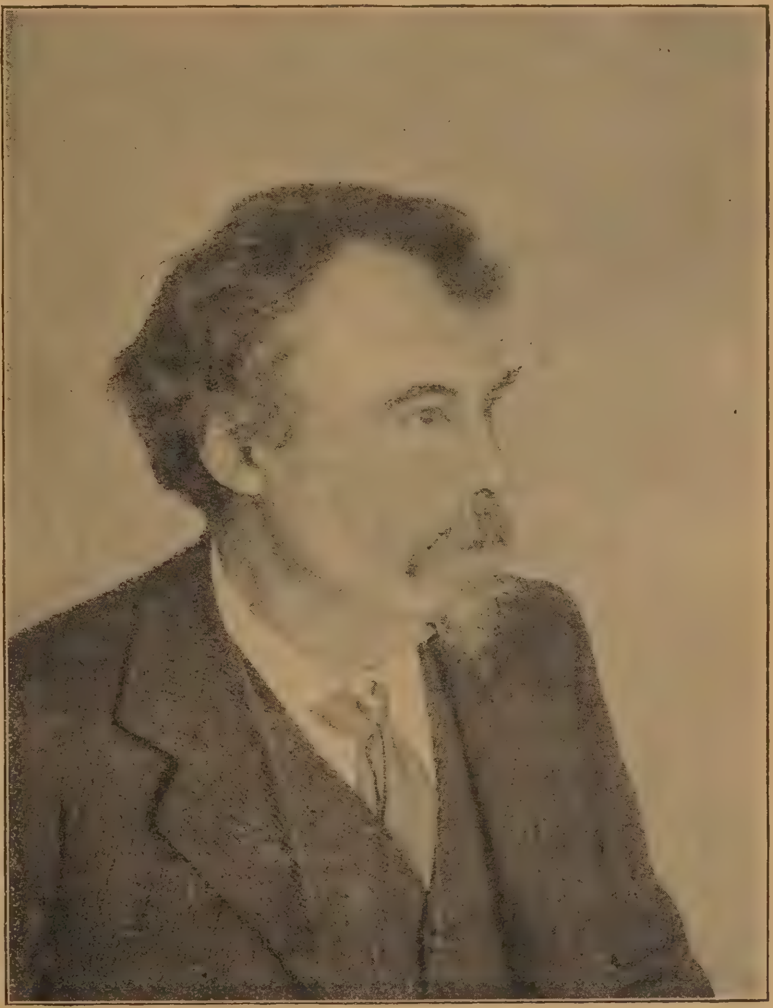
Our Plates. FROMOND'S CHANTRY, Winchester College, was erected thin the cloisters as a chantry for the ad, and founded by John Fromond in the teenth century. The ground floor measures ernally 36ft. by 18ft. by 27ft. 2in. to the lge of the vaulting, the ceiling being divided to two equal bays of Lierne vaulting. There is solid stone altar at the east end. The first or measures 36ft. 11in. by 18ft. 11in. by ft. 6in. high and is covered with a plaster iling. This floor, compared with that under- ath, is very plain, with the exception of the o end windows. There is a circular staircase in urret at the south-west corner, a gable at each d and an embattled parapet both sides. The apel was converted into a library during the formation, but has since reverted to its former e, and is now used as an "overflow" chapel r the college, the first floor being still occupied a library. The drawings are by Arthur H. hnson, of Winchester.

The Liverpool athedral Com- ttee's Pamphlet. MR. T. MYDDLETON SHALLCROSS, hon. secretary (pro tem.) of the Liverpool Cathedral Petition Committee, says of c pamphlet in question that it "chiefly consists a mere reprint of the misleading statements ich have appeared in the press from time to ne, and which have then been shown to be correct and not at the time further contested. e value of the St. James's Mount site is stated be only 'a little over £10,000' (*i.e.*, the cost of ising the mound and laying it out many years o, and not its present market value), whereas eir own diocesan surveyor, Mr. Bradbury, has lued it at £20,000, and the Corporation surveyor, r. Shelmerdine, at £35,000, and both of these luations are probably less by some £60,000 to 70,000 than the actual market value of the site d houses. On the other hand, however, onument Place site is stated to be worth over 200,000, without trade compensations, although r. Bradbury and Mr. Shelmerdine have each lued it at £130,000, with £50,000 for trade mpensations. Again, it is stated that there a railway tunnel underneath the corner of onument Place site 'which might prove a urce of very great inconvenience'; but no ference is made to the fact that another ailway tunnel' is close to the St. James's ount site, which, were there any real objection either case, might prove an equal source of convenience. . . . The pamphlet suggests that e St. James's Mount site has been selected cause it is the best and not because it is cheap. et Lord Derby stated at the Town Hall meet- g in June last that its selection was due to otives of economy; and it is a fact that the athedral Sites Committee reported that Monu- ent Place site was the best, and recommended s adoption."

Indian Victoria Memorial. LORD CURZON, the Viceroy, has issued a long note with reference to the Victoria emorial Hall. His Excellency says that irty lakhs of rupees have been promised and at more are expected. A Building Committee needed. During the past year attention has en given to the questions of style, site and aterial. It would be useless to attempt to ect a modern Taj in the Classical style. The st material would be white marble, as far as ossible Indian. With regard to the site the lternative suggestions have been found unsuitble, and the original selection will be adhered , the main front of the building being to the est. With reference to designs, the note ontinues, the Viceroy has conferred with Mr. merson, the President of the Royal Institute f British Architects. It is essential that the uilding should be several feet above the round in order to secure a foundation for the roposed terrace, 400ft. long, which is to run long the front of the building. The building tself will occupy a parallelogram. The Queen's Hall in the centre will contain a statue of the Queen only. Mr. Frampton's statue will be at the entrance. On the left hand there will be a sculpture gallery, and on the right a picture gallery. Room will also be provided for various other collections The grounds will be thirty acres in extent, and will be fenced. Additional funds are needed for the building and for its upkeep and endowment, and for the purchase of the contents.

The Archers' Hall, Edinburgh. THE old building which for long has in a way been a conspicuous figure standing back from the thoroughfare in Buccleuch Street, Edinburgh, has been reconstructed from plans prepared by Dr. R. Rowand Anderson. The original structure formed a square of about 40ft. All that remains of it now are the outer walls. An addition has been made at the south end, and the piece of ground which stood open in front has been enclosed with ornamental wrought-iron railings and gates. As reconstructed the hall of the Royal Company of Archers consists of three floors. The basement is given up to kitchen, and scullery, housekeeper's rooms, &c. The first flat includes a large entrance hall with cloak-room and lavatory accommodation running off it. Occupying the entire length of the old building on the west side is the reception-room. The dining-hall is on the upper floor and fills the whole area of the old building.

Structural Ironwork. AT the monthly meeting of the Leeds Association of Engineers, Mr. Alfred Towler in the chair, Prof. John Goodman read a paper on "Structural Ironwork." The value of building sites in big cities, he said, had risen to such an extent that a structure could now only be made to yield a reasonable return on the outlay by making the best possible use of space. For ome buildings stone, brick, &c., answered admirably, but in their use for very high buildings serious difficulties arose. Mild steel was, roughly, seventy times as strong as stone in tension, seven times in compression, and ten times as rigid, whilst lending itself readily to structural purposes. Some years ago there was a prejudice against the use of steel made by the Basic-Bessemer process, but now structural steel was turned out by this process practically equal in every respect to that made by the acid-open-hearth process. For filling in, materials were required that would resist the weather, and thus by using those best suited to the purpose the highest art was arrived at. Professor Goodman gave examples of steel skeleton buildings. Columns, he said, should approximate as nearly as practicable to the hollow circular section. This was illustrated by diagrams of curves showing the relative strength of various sections according to Rankine's modification of Gordon's formula. Other curves showed their relative cost. A column should be centrally loaded, a fact which was often depreciated by architects. For a hollow circular column 30ft. long, 12in. in external diameter, and 1in. thick, the safe load applied at the axis was 116 tons, but 1in. from the axis only 31 tons. Though the action of fire on steel was too big a subject to be dealt with, experience had shown that a properly constructed steel frame would withstand fire better than brickwork or masonry, because distortion through expansion was of little consequence.



J. F. BENTLEY, ROYAL GOLD MEDALLIST, 1902.

The Royal Gold Medallist, 1902. MR. J. F. BENTLEY has been named as the fitting recipient for the Royal Gold Medal this year—"for his work as an architect"; and no better choice could have been made. His greatest work is his last—Westminster Cathedral, one of the most original buildings in recent times. A "Men who Build" article dealing with Mr. Bentley appeared in the BUILDERS' JOURNAL for July 9th, 1895.

ANCIENT VERSUS MODERN BUILDING.*

I AM glad to have an opportunity of addressing an important assembly like this, recognising as I do that your Association is formed to meet the needs of the present day in a practical way and to make an effort to devote your leisure hours to the pursuit of that which will enable you to become more proficient in your craft and carry out your work in the best possible way.

To stand before a grand old building which has stood the test of time, to think of those who wrought in it and whose work remains a monument of their care and labour—this is an inspiration. We shall notice in such a building how very carefully the so-called minor details—the beds and joints of the stonework (even of parts out of sight), the framing and jointing of the timbers—have been carried out. And let the question be put: "Is modern building work equal to this ancient work?" In this particular I am not now speaking of design—that is a matter with which, from our position as craftsmen in modern times, we have very little to do. I refer more particularly to the work or the matters which come under the control of the builder and his men. There are several considerations which enter into the case. We must first remember that only the *best* of the ancient buildings remain. There is, for instance, the Colosseum at Rome, but we do not see the square miles of buildings which once formed the houses of the Romans; and although in such remains as those at Pompeii there is plenty of evidence that there was very much good work done in the building of houses, yet there is no real reason to believe that the smaller ones were any better built than those of to-day. In former times every workman was proud of his craft, every good workman prided himself in his dexterity in it, and work seemed more human when men were allowed a large amount of freedom in executing it. The man was not merely one of 500 "hands" in a shop or a factory, but he was the carpenter or the mason or the smith who, within certain limits at least, could deal with his timber or his stone or his iron exactly as he thought best; he could put his own fancies into it, and, above all, get credit for them when he had done so.

Work done under these conditions must have been much more inspiring than that which is done according to the mechanical methods of to-day. It was possible then for a man to rejoice in his labour, but in the modern building you look in vain for the corresponding sign of free and lavish craftsmanship. Yet, though we do our work under new conditions, we need not envy the past nor entirely despair of the future, for the good qualities that animated the old work are not all dead.

Some attempt has been made in recent years to remedy the system which separates the designer from the craftsman, and we have the various guilds of arts and crafts, who no doubt are doing a very useful work in training workers both to work skilfully with their hands and at the same time exercise their own ingenuity and give expression to their individual ideas; and there is a marked difference between work so produced and the smooth mechanical product of modern machinery. Let me say here that the influence of good or bad work upon the character of the worker himself is great. A mason who is accustomed to make bad and careless joints, a joiner who habitually frames his work together faultily, will have his own moral ideas and sensibilities dwarfed and his sense of justice blunted. Life was meant to be worth the living; and work was meant to be worth the doing.

What then is the difference between the old buildings and the new?—for it is patent to everyone that modern building *is* quite different in spirit and character to the old. In the old there is exhibited a carefulness in the selection of materials and an intelligence in the working of them which I think is greatly if not wholly lacking in modern work, and not only so, but the materials themselves which are now used are much more largely of the manufactured class, bearing the mark of the machine and, as a consequence, suffering from dulness and flatness

It is said that Nature abhors a straight line; at any rate it is very difficult to find one, in flower or leaf, in tree-trunk or branches, in the face of the earth itself or the living creatures on it.

The stone in the old buildings was rough and showed the marks of the hammer that dressed it: in the new buildings we see carefully combed Bath stone. The old bricks were hand-made, uneven in shape and often of many tints, built with a certain sweetness of freedom and a disregard for a perfectly level or straight mortar joint, whereas nowadays we mostly use bricks of a monotonous colour, pressed perfectly square by the most modern machinery, and, as the specification provides, with "neatly cut and struck joints."

We have many beautiful examples of the old work throughout the country, and one very close to our own doors—at Aston Hall. This building was built by Sir Thomas Holt in the reign of James the First, in the early part of the sixteenth century. The bricks used in its construction are about 11in. long and 2½in. thick with a mortar joint ½in. thick, and although four centuries have passed since its erection and the mortar joint is a wide one according to our present-day ideas, yet it has well withstood the ravages of time and weather and only the outer surface has peeled off. On a close examination it will be found that the mortar was made with a very gritty sand, which adds to its appearance.

The timber in Aston Hall is nearly all of English oak, cut down no doubt from the surrounding park and very probably buried in the ground for a number of years to season, a very different process from our own, for I can well imagine anyone starting to build it now would want the whole building finished within a year But what is the result of this careful work? The whole is to-day in a very good state of preservation, and no doubt with care bestowed upon it will last for many generations yet. The stonework must have been most carefully selected and manipulated, and all the building, so "fitly framed together," is a monument of good workmanship. It may be said that this was a mansion and so money was *lavished* on it. Well, let us look at another building in the same neighbourhood and built about a century later—the "Holt Almshouses." Although these are only cottages they also exhibit care and thoroughness in building and, comparatively speaking, have withstood the elements as well as the larger Hall. In our ecclesiastical buildings too we see the highest products of the skill of the builder and craftsman. Yet, to-day even our churches and chapels are sometimes flimsily built. Nonconformists are the greater sinners in this respect. A short time ago, speaking at a stone-laying ceremony in connection with the extension of a Congregational church which I was carrying out, an eminent Nonconformist divine adjured architects to abandon their æsthetic designs and costly finishings for churches, and instead to build them to hold as many people and *at as little cost* as possible, a sentiment quite unworthy of the speaker and of the cause for which he was pleading.

For many of the shortcomings in modern work the commercial spirit of the age is responsible—the spirit of gain and money-making. Everything must be turned out "at a price" and in addition the work is required to be done within a stipulated time, often a most unreasonably short one, which makes good lasting work impossible. In buildings like hospitals, clubs or large residences there is a care for health and comfort, as well as good workmanship, which is a credit to those who build them; but in the modern villa of a certain type, and especially in the workmen's dwellings of to-day, the spirit of commercialism is dominant, and, were it not for the restrictions of the local authorities, then things would be bad indeed. The building of houses for the people is a most important department of modern building, for the influence of their surroundings cannot be over-rated. A great writer has said: "I am a part of all that I have met," and if this be true how much more may it be said that one is a part of that in which he continually lives.

Unfortunately the building of workmen's dwellings is for the most part left to unprincipled speculators, who buy a field, drive a street through it, scarcely taking the trouble to strip off the turf, and in an incredibly short time the rows of flat repulsive houses are reared. Badly-built houses are a crime against humanity, and their influence on the men, women and children who inhabit them is most direful; but the jerry-builder is not overburdened with conscience and sacrifices everything to the consideration of cheapness. These houses soon fall into a condition of bad repair and afterwards become mere squalid hovels. Surely the remedy for this state of things is at any rate to some extent in your own hands. If I were the leader in the trade union I would try to induce workmen not to work for a jerry-builder, or if they did, to insist on the work being done in a proper manner. Attention has lately been directed to a "Garden City" scheme, and the benefits which are connected with it can be seen at the great industrial settlement known as "Port Sunlight." The houses in "the village" are *built*, not thrown together, and have the most modern sanitation; there are 230 or 240 houses in the village and about 1,800 workpeople. Each cottage has a bath-room and not one contains fewer than three bedrooms. A similar village has been founded by the Brothers Cadbury at Bournville: and if we cannot start such schemes as these we can at least refrain from having any part in the erection of jerry-built houses which operate in an exactly different direction and instead of promoting the happiness of those who live in them bring a great deal of discomfort and misfortune.

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* Summary of a paper read before the Birmingham and District Clerk of Works and Builders' Foremen's Association by Albert S. Smith, president of the Birmingham Master-Builders' Association.

New Patents.

These patents are open to opposition until March 15th.

1901.—Heating Greenhouses.—3,695, E. J. JOHNSTONE, Rougham Hall, Bury St. Edmunds. The circulating pipes are placed in or surrounded by a tank of water, which gives off heat evenly and regularly: and also retains the heat for some hours after the fires have gone out.

Brickmaking Machines.—4,772, H. J. LINTOTT Horsham Engineering Works, Horsham, Sussex. This invention relates to a mill for hand-made bricks and its object is to avoid the necessity for employing hand labour to convey the pugged clay from the mill to the moulding table. Thus, the pug-mill is sunk in the ground beside the table so that clay may be tipped into it from a barrow. It is provided with cutters mounted on a horizontal shaft, while at the bottom there is an opening communicating with a trunk containing a spiral, which raises the clay to the table.

Treating Bricks.—10,160. A. J. KEEBLE, Walton House, Park Road, Peterborough. To prevent "scum" the brick or tile, before being dried and fired, is dipped into a solution of glue 25 lbs. dissolved in 20 gals. of water. The colour of the brick is thus kept uniform throughout.

The following specifications were published on Thursday last, and are open to opposition until March 22nd. The names in italics are those of the communicators of the inventions. A summary of the more important of them will be given next week.

1900.—23,461, WAYSS & FREYTAG, method of impregnation and isolation of protecting pipes for underground cables, &c.

1901.—592, GRATH, kilns. 876, STEAD, self-acting opening and closing apparatus for doors. 1,640, RUTNAGUR, water-supply controlling and waste-preventing apparatus. 2,531, HUGHES, cistern valve. 2,613, SNOWDON, kilns. 2,728, HEAP, roofing tiles. 3,412, ADAMS, appliances for operating fanlights, casements, &c. 3,428, PROCTER, chimney tops and ventilators. 3,814, DOMAN, hinges. 3,919, FIDDLER, PURCELL & DURNFORD, picks, axes, hammers, &c. 4,123, HILDRED & R. WAYGOOD & CO., LTD., slack-cable safety gears for electrically-operated lifts, 4,172, BRYANT & WITCOMBE, planes. 4,267. DIXON, self-closing taps. 4,468, CASSELS, stable fittings. 4,749, STEWART, spanners or pipe wrenches. 7,789, STUBBS, scaffold bracket. 7,992, CASE, smoke sewer systems.

8,870, ZACZEK, paper air-pipes for ventilation. 9,158, BROWN, pulley frames for windows. 11,472, STONE, rope clamps 14,306, GARUTI & POMPILI, process of soldering with oxy-hydrogen gas. 17,431, WOOD & BARTLETT, manufacture of woodite. 18,470, MARTIN, window sashes and frames. 22,198, BOULT (*Scherzer*), bridges. 22,314, VON FORELL, apparatus for the preparation of Portland cement from blast-furnace slag or cinder. 22,383, HUGHES (*Larsen & Wong*), pulley block. 23,061, MOATE, locks. 24,475, CARTER, elastic plaster for walls and ceilings.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Architect's Charges for Preparing Quantities, &c.

W. H. G. writes: "After preparing the plans, &c., for a small house, I was asked to obtain tenders. I prepared quantities (without the client's orders) and had copies made which were sent to the respective builders. The lowest tender received was £408. This amount being too high, I was able by alterations and deductions to reduce it to £292. Can I lawfully charge for these quantities and copies; if so, to what extent? Also, upon which tender can I claim the usual 2½ per cent. for working drawings, &c.?"

You can claim what is a fair charge, and you are entitled to be paid for the preparation of quantities and plans on the £408, additional for modifying, and the final 2½ per cent. for execution of work upon the £292. You are entitled at least to 2½ per cent. on £408 for plans, 2½ per cent. on this amount for procuring tenders and taking out quantities, and 2½ per cent. on £292 for execution, and extra payment for making deductions. If, however, you were given orders in the first instance not to exceed £300, we do not think you can legitimately claim for more than 6 per cent. on this amount and another 2 per cent. for quantities: 5 per cent. for such a small house is not remunerative.

Bad Draught in Flue.

BIRMINGHAM.—THE JEVON CO. write: "We have fixed a small hot-water boiler with about 9ft. of 5in. cast-iron smoke pipe, carried into a 9in. drain-pipe flue running under a conservatory floor about 40ft., entering a soot chamber covered with stone slab, and turning off nearly at right angles (80 degs.) another 20ft. under ground into a new 9in. by 9in. flue 40ft. high. We cannot get this to draw, and we fear we have made a mistake in laying too large a drain-pipe. Can you suggest a remedy?"

The horizontal part of the flue will of course tend to cool the gases very considerably before they reach the vertical part, besides causing considerable friction, but even then a height of 40ft. ought to cause a perceptible draught, although probably insufficient. The most important thing is to see that there is no leakage whatever of air through any of the joints or connections between the boiler and the highest point of the flue. Changes of sectional area are bad for a flue or for any other conduit for the transmission of fluids or liquids. The 9in. drain-pipe flue instead of 6in. is not the cause of the want of draught, but the great horizontal distance compared with the vertical height. The main points to keep in view are to send the gases hot into the chimney and to let no cold air leak in anywhere. Of course if the chimney can be raised the draught will be improved, presuming that the furnace is so situated that air to feed the fire is readily admitted.

HENRY ADAMS.

Quantity Surveyors' Fees.

SOUTHPORT.—G. H. writes: "What do surveyors usually charge for (1) taking out quantities, (2) measuring up the building, making out extras and omissions and checking accounts?"

(1) For small or difficult works up to £2,000 value, 2½ per cent. For ordinary works from £2,000 to £10,000 1½ per cent.; above this 1 per cent.; lithography extra. (2) For measuring up works for small new buildings and in repairs, including bill of particulars, 2½ per cent., in large new works of plain character 1½ per cent.; in works of small value three guineas per day. For measuring up extras and omissions, 2½ per cent. on amount of extras, 1½ per cent. on omission if involving measurement, and 1 per cent. on omissions if not involving measurement.

Condensation of Moisture.

VINO writes: "A solid concrete floor has been laid 7in. thick of cement and breeze ashes, with a granolithic topping. The ceiling on the underside sweats very much and has done so for more than four months. The cellars have to be kept warm and the heating is done by gas. Directly the gas is lowered and the temperature falls the moisture disappears. Is this condensation, and if so, what can be done to stop it? I do not think any moisture comes from above."

A gas fire produces a large amount of moisture and this will condense on any cold surface. The ventilation requires to be improved. It would be best also to board the ceiling under the open yard with slag-wool in between, as it is an excellent non-conductor.

Width of New Streets.

CAMBERLEY.—F. C. U. writes: "The approach to the six proposed cottages shown on the accompanying plan (not reproduced) is by a 15ft. road in front and a 4ft. passage at the rear. The Model By-laws of the L.G.B. are in force in this district and where a new street is proposed they require the same to be 36ft. wide; and every street not intended as the principal approach to any building, but for the removal of the contents of any privy, ash-pit, &c., to be 16ft. wide. (1) Do existing buildings (which are old) affect the circumstances of the case? (2) Is the owner forming a new street; and if so is the street in accordance with the local by-laws? (3) Do the proposed houses contravene the Buildings in Streets Act, 1888, in relation to the building line?"

(1) The existing buildings do not apparently affect this particular case, so far as regards the new buildings under consideration. (2) Yes; but the proposed new street is not in accordance with the local by-laws. (3) It is considered that the proposed houses do not contravene the Public Health (Buildings in Streets) Act of 1888, 51 & 52 Vict., c. 52, as reasonably interpreted and applied to this particular instance.

T. E. C.

Architectural Lettering.

HASLINGDEN.—BINKS writes: "Kindly name a good book for different styles of lettering suitable for an architect or surveyor when making the headings for large plans?"

"Alphabets, Old and New," by Lewis F. Day (B. T. Batsford, 3s. 6d. nett).

Formulæ and Particulars of Timber.

FROME.—YOUNG ARCHITECT writes: "Please recommend a good pocket-book giving the sizes of timbers for different spans, &c.?"

Hurst's "Architectural Surveyor's Handbook" (E. & F. N. Spon, 4s. nett).

Temple of Eleusis.

NORTHAMPTON.—ARCHITECT writes: "(1) Where can I obtain information concerning the Greek Ionic Temple of Eleusis? (2) In preparing the sheet of drawings of Gothic ornament from the round for the R.I.B.A. Intermediate Examination, must I give one drawing to fill the whole sheet, or could I give half a dozen small ones?"

(1) See p. 93 of our issue of September 5th, 1900. (2) A sheet of drawings of several examples of Gothic ornament is required.

Remedying Dampness in Wall.

LEAMINGTON SPA.—NEWOB writes: "I have been asked to suggest a remedy for damp in the following case. The outer 9in. wall of a dwelling-house absorbs the rain to such an extent that it shows on the inside, making the wallpaper damp and discoloured. The wall is built of ordinary common bricks, and plastered on the inside. Can you suggest a remedy? Something cheap and simple preferred."

You can either render the wall outside with Portland cement; tile or slate it; or coat it with a composition of tar and pitch, applied hot. The last method is cheap but unsightly and requires constant renewal.

Architectural and Surveying Appointments under Government.

DUBLIN.—PERPLEXED writes: "What positions in His Majesty's Service are open to a young architect and surveyor?"

The principal appointments of this nature under Government are those of Assistant Civil Engineer, Admiralty; Assistant Surveyor, Royal Engineers; and Assistant-Surveyor, Admiralty. These are obtained by open competitive examination, particulars of which will be supplied gratis by the Secretary, Civil Service Commissioners, 68, Victoria Street, S.W., who will also supply details of the examination for County Surveyors in Ireland. Appointments under municipal bodies are, as a rule, obtainable only by application, supported by local influence.

Architects' Formulæ.

LONDON, N.—F. G. J. writes: "In an old R.I.B.A. examination paper appears the formula for beams $W = \frac{cbd^2}{l}$ which is referred to as the 'ordinary' formula. Where can I find an explanation of it?"

The formulæ generally used by architects are set out and explained in Hurst's "Architectural Surveyor's Handbook."

White Efflorescence on Brickwork.

KINGSBRIDGE.—T. W. L. writes: "How can I prevent white deposit showing on the face of brickwork (probably due to salt)?"

The white efflorescence is saltpetre, and is due to the bad composition of the cement or lime. When these combine to form insoluble compounds the saltpetre is often produced as a by-product, but this is evidence of bad composition. The clays used in bricks also often contain saltpetre, and effloresce. It can be removed as it appears by applying acids to the surface with a brush.

Board School Buildings.

ILKLEY.—R. F. writes: "Where can I obtain particulars of the accommodation, light, ventilation, &c., required in Board School buildings?"

See a paper on Board Schools read by Mr. T. J. Bailey before the Royal Institute of British Architects on May 29th, 1899, and published in the transactions.

Timber Roof and Cost of School.

LONDON, N.W.—FENLAND writes: "(1) Is the roof shown on the accompanying sketch (not reproduced) suitable for a span of 21ft., the outer walls being 13½in. thick, and the ceiling carried up to the collar? What would be the price per scholar of a mixed school for 170, built in one storey in yellow brick walls, red tile roofs, and 14ft. high to ceiling; wood block floors, walls plastered inside and coloured?"

(1) Yes, the roof would be good enough, but a simpler and cheaper one would answer the purpose quite as well. See Rivington's Building Construction, Vol. I., where sizes of timbers, &c., are given. Straps should be used at all joints. There is no need for a buttress with 13½in. walls. The methods of calculating dimensions and thicknesses of walls and buttresses are given in Allen's, Mitchell's or Rivington's books on Building Construction. (2) We can only give you a very rough approximate cost namely, about 6d. per foot cube, or £7 per scholar.

Masters and Men.

Blackpool and St. Annes Joiners' Strike has been settled after a struggle of fourteen months. The employees have decided to accept the employers' terms of 8½d. per hour, subject to some slight alteration in certain of the rules. The terms of settlement are equivalent to ½d. less per hour than the men were receiving prior to the dispute. In order to provide against any further disruption in the future a conciliation board will be formed, consisting of three representatives of the masters and men, to watch the respective interests.

Bricklaying and Trade-Unionism : L.C.C. Enquiry.—The Finance Committee of the London County Council have instituted enquiries in view of the statements made in "The Times" that the maximum of 400 bricks per day was the recognised limit for dwelling-houses, shops and business premises built by a private contractor; and that the Council's limit was 330 bricks per day. After remarking that no such "limit" has been recognised by the works manager, the Committee say : "We have been furnished with the opinions of several London firms of contractors as to the present and past output of bricklayers employed by them. There is a difference of opinion as to the number of bricks actually laid, but we find a general agreement that the number laid per man per day is considerably less than the corresponding number laid from twelve to fifteen years ago, though it has risen somewhat from the number laid two or three years ago. The officers of the Council whom we have examined are not altogether agreed as to whether the number of bricks laid by men employed in the Works Department is equal to the number laid by bricklayers employed by contractors. Although we have given the matter our careful attention, the difficulty of obtaining accurate and comparable data has prevented us from arriving at any definite conclusion upon the point. We have not been able to obtain detailed information with respect to any of the large works completed by the Department owing to the absence of any details as to the actual cost to the Department of brickwork. We have, however, obtained from the manager of works a rough calculation of the rate of three works recently executed or in course of execution by the Works Department—namely, Perry Vale fire station, Battersea Bridge dwellings and Seymour and Somerset buildings. The manager arrives at his results by dividing the total number of rods of brickwork by the number of hours returned as worked in laying the bricks. We conclude from the figures that, taking into account every class of brickwork found in buildings of the above character, the figure of 330 bricks per man per day is considerably below the number actually laid."

Workmen's Compensation and Wages : Deputation to the Home Secretary.—Replying to a deputation which waited on him last Thursday from the Parliamentary Committee of the Trades Union Congress, Mr. Ritchie said that labour at the present time was in a much more satisfactory condition than it had been. The deputation had really only brought before him two questions. One was the Workmen's Compensation Act, of which it was stated, and he thought with justice, that it should be amended and made more simple and comprehensive. At the same time he contended that nothing should be done that would hamper employers in their business, because it would be injurious not only to them but also to the employed. With regard to the general question of the amendment of the Act, he thought they would be acting on sound lines by resolving not to unduly hurry forward the amendment. The result of his observations might be summed up thus: they acknowledged that there were various points which were unsatisfactorily dealt with; they were carefully watching all these various schemes with a view to bringing forward an amended Bill; and when that Bill was brought forward they would also have to consider the question whether it should be extended to other trades, and if so to what trades. The Parliamentary Committee also asked not only for an enforcement of the existing law, but also for a considerable extension of it. What was known as the fair wages clause did not go to anything like the length which the resolution before him desired it should go, because it was sought to substitute for the fair wages clause a clause saying that payment should not be less than the trades-union rate of wages in the district. He did not think he could hold out any further hope of extension of the existing law in that direction. In such a case as that which had been brought before him, where it was asserted that some men were paid less than others in a district, he suggested that it might be dealt with by a penalty for breach of contract. If a contractor did not carry out the terms of his contract he was liable to be struck off the list of contractors. That would be one of the most drastic clauses, and he should be glad indeed to make a representation to the Treasury in regard to that point, and he felt that the Treasury would readily agree with him.

Engineering Notes.

The Cost of the Trans-Siberian Railway up to date has been approximately £40,000,000. A further sum of £2,000,000 or £3,000,000 will be required to complete it. This gives an average of about £5,000 a kilometre.

St. John's Church, Devizes, has lately been fitted by Messrs. John King, Ltd., engineers, Liverpool, with their "Small Tube" hot-water heating apparatus, employing their economical coil heater with waterway firebars.

The Union Infirmary, Kington, Herefordshire, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A New Bridge at Guildford has been opened across the Wey. The bridge, which has been constructed of iron girders of a span of 70ft., take the place of the old brick and stone structure which collapsed in the flood at Guildford nearly two years ago. It has been built from designs of Mr. J. Webster, M.I.C.E., by Messrs. Fasey & Son, of Leytonstone, the contract price being £5,596.

A Rapid Railway between Glasgow and Edinburgh.—The "Glasgow Evening Citizen" announces an important project for the construction of a railway on the mono-line principle between Edinburgh and Glasgow, similar to the one being made between Liverpool and Manchester. Plans and a mapped route have been submitted to the Board of Trade. The intention is to give a ten-minute service of trains running at a speed of 117 miles per hour, the distance to be done in twenty-five minutes. There will be no intermediate stations.

The Electric Lighting Boards (British Manufacturing Co.), Ltd., announce that as extra accommodation has now been made available at their registered office, 7, Pall Mall, S.W., the counting house has been removed to that address. (Telephone No. 2,412 Gerrard; telegrams: "Elbenborn London"; Code A, B, C, 5th.) The accommodation at No. 9, Grosvenor Mansions will therefore be devoted entirely to sales. The Company also announce the engagement of Mr. H. Brome Tarry, for many years with Messrs. Lucas & Aird, the great contractors, who will act as manager with Mr. Holland (late assistant trade manager of Messrs. Ind Coope & Co.) as general assistant, and Mr. W. G. Haywood as before works superintendent.

The Institution of Civil Engineers held a meeting last Tuesday, Mr. Charles Hawksley, president, in the chair. Four Associate Members were transferred to the class of Members, namely, Messrs. C. S. V. Brown, W. B. MacCabe, R. W. Richards and W. Spinks. The monthly ballot resulted in the election of six Members, namely, Messrs. A. W. H. Casson, H. D. Ellis, J. J. Impett, J. N. Digues la Touche, F. T. Rednall, Prof. G. F. Swain; nineteen Associate Members, namely, Messrs. E. V. Clarke, B.Sc., R. Das, H. D. Dormor, R. W. Hammond, F. J. Jones, C. B. McRitchie, F. A. Molony, J. Mountifield, T. O. Mullings, W. H. Neilson, B.A.I, A. C. H. Palmer, A. C. Rettie, L. Roseveare, T. Sano, R. S. Solomon, H. S. Threlfall, M.Sc., F. J. C. Tyley, R. W. Vawdrey, B.A., and J. Yamaguchi (Brondesbury); and one Associate, viz., J. F. Thallon.

Ventilation of The Central London Railway is to be improved and experiments are now being made.

Utilising the Tides for Electric Lighting.—At Walton-on-the-Naze a scheme is being carried out for utilising the tides in the back-water to generate a current for electrically lighting the town. It is estimated that the tides will develop sufficient power for both public and private lighting.

Mr. Francis Stevenson, M.I.C.E., the late chief engineer of the London and North-Western Railway Company, died recently. He was born on August 27th, 1827. Mr. Stevenson was an ardent lover of nature, with a profound veneration for ancient and historical buildings. When designing new work, whilst he kept in view the principles of reasonable economy, he was careful so to arrange his designs that as far as practicable they should leave undisturbed any prominent or pleasing feature in the vicinity.

"The Electric Passenger Elevator."—This was the title of the paper which Mr. William J. Cooper read before the Institution of Junior Engineers on Friday last, Mr. Percival Marshall presiding. After dealing with the chief features of an ordinary gear the lecturer said that the electric motor and the winding machinery could be erected either at the top or at the bottom of the hoistway. If fixed at the top, one face of the drum could be plumb over the centre of the car, and the other face plumb over the counterbalance weight. Under special circumstances the machinery might be placed at a distance from the hoistway, and the ropes guided over diverting sheaves, but it was obvious however that the fewer sheaves employed, the less would be the wear on the ropes and less by friction. The arrangement of placing the machinery at the top of the hoistway was particularly adapted to the electric elevator, as the current was easily conveyed by the cables to the motor and controller. The lecturer dwelt on the importance of an efficient form of brake. It might be mechanically operated from the switch gear shaft by the controlling rope or by an automatic magnetic solonoid brake, the type now generally adopted. A solonoid and magnet of small dimensions could be made to give a pull of 500lbs. or 600lbs. through ½in. To meet the severe demands of the elevator, motors of a somewhat distinct class had been introduced, constructed so as to need little attention. A comparatively small motor could be used, as in all cases the maximum load was of short duration, the motor standing idle for at least half the time. Shunt motors were self-regulating if the potential was constant, and were now almost invariably adopted, but with about 10 per cent. of series winding added on the field magnets to enable the motor to develop a powerful torque at the moment of starting. Considerable ingenuity had been expended over the starting and controlling switches, the operation of which might be effected in various ways—either by a hand rope, a hand wheel, a lever, or by a push-button device. The last was to be recommended for private houses or places where an attendant was not required, the elevator being operated by the passenger. After referring to automatic safety devices Mr. Cooper said that an electrical locking apparatus should be fitted to all electric elevators, by which all the hoistway doors or gates would remain locked, except when the car itself was in position at the landing, and stationary. The opening of any door was arranged to break the main circuit of the motor, and it was impossible for it to be started again until the gate was shut and locked and the circuit remade. In conclusion the lecturer pointed out that the power or current used in an electric elevator was in direct proportion to the number of persons or load carried, while with one worked hydraulically it was necessary to fill the cylinder with power water whether the load was light or heavy.

A Site for St. Cyprian's Church, Dorset Square, N.W., has now been purchased from Viscount Portman, a condition of the sale being that the church is built and ready for consecration by June 1st, 1904. The architect is Mr. J. N. Comper, of the firm of Messrs. Bucknall & Comper.

BUILDING CONSTRUCTION.

(Continued from p. 405, No. 363.)

77. EDUCATION will not result from reading or hearing facts which do not appease our mental wants. There is no use in our trying to stuff the mental stomach which is not hungry; there is but little good in education, if indeed it can be called education, whose main purpose is the passing of examinations in the subjects crammed. Examination is valuable and necessary, but the assaying of gold does not produce gold, neither does examination produce scholarship. These things, though often repeated, are more often overlooked. The writer is frequently consulted by parents in regard to proposed careers for their sons (usually respecting some department of engineering). The boy who is handy with tools is the most frequent subject. The object of these articles is to take the workman's side of questions of Building Construction to a greater degree than is done in most of the books, in the belief that this is the direction in which it can be taken with the best educational effect. Most of us have opportunities every day of seeing building operations; if these appeal to us, if we are interested in the growth of buildings, and if we observe workmen at work as a growing habit in ourselves, surely there will be little drudgery in reading particulars and details which are the result of the experience and thought of very many other observers. If we are not in the slightest degree interested in constructional work, if we have no desire to stop and look, if we do not notice the variety of stone and brick employed, and if we do not, at least, feel inclined to ask about any material or mode of working which is unfamiliar to us, then we had better have nothing to do with Building Construction classes and try in some other direction for our education. For a boy to be handy with tools is a good sign, but it is not all the evidence —it is indeed only a small part of it; mere handiness, dexterity with tools and neatness in performing a repeated operation, is not a high faculty; the best workman does not invariably make the best foreman. To be able to do good work by the hands of the average workman is a much higher achievement than to do good work with our own hands. Much of this may be beside what it is desired to express. The argument is intended to be in favour of the method herein employed, that is, making use of a building which has actually been constructed and dealing with its parts as they have come together synthetically. Elementary buildings have been dealt with with considerable minuteness. So far as the articles have gone, it has been the writer's plan to block out the article and then send for an intelligent workman of each particular trade and talk it over with him, and after this consultation the article was written out for the printer. This, of course, does not apply to the articles on "Forces applied to Structures." These articles were written because the writer knows that the subject has hitherto been almost totally neglected in Building Construction classes and it is not sufficiently treated in Building Construction text-books. It is a department of mechanics; it was necessary to pick out the parts essential to Building Construction and place them before students of that subject.

In the articles references have been made from time to time to what it was intended to further explain when the same trade was to be dealt with in more "advanced" buildings. If these further explanations do not appear in the few articles which it will be possible for me to further contribute, students will take the references as indicating the method which I think ought to be followed in any new text-book.

78. In Fig. 20 a method of drawing the joints in rings of elliptical arches was used which possibly deserves some particular note. Ellipses may be drawn with great accuracy with a paper trammel, and students are advised to draw ellipses in this way. Consider the ellipse shown in Fig. 111. Its equation, referred to its major and minor axes as axes of co-ordinates, is $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$. The figure R Q¹ R¹ Q represents the evolute of the ellipse. It is such that every normal, *i.e.*, every right line which

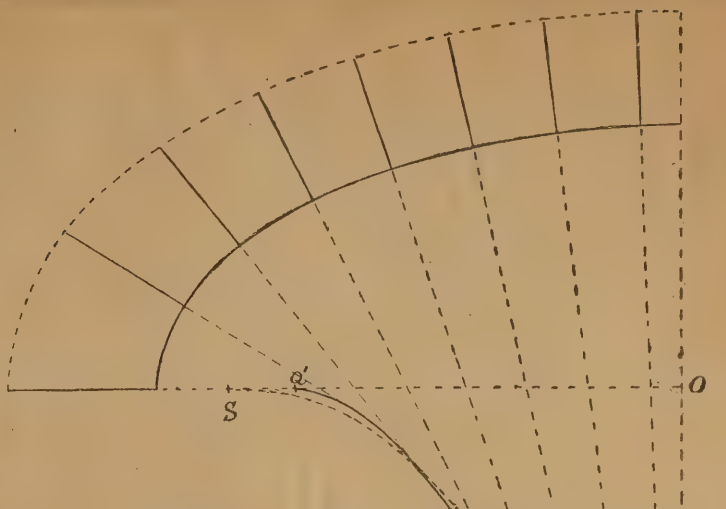


FIG. 112.

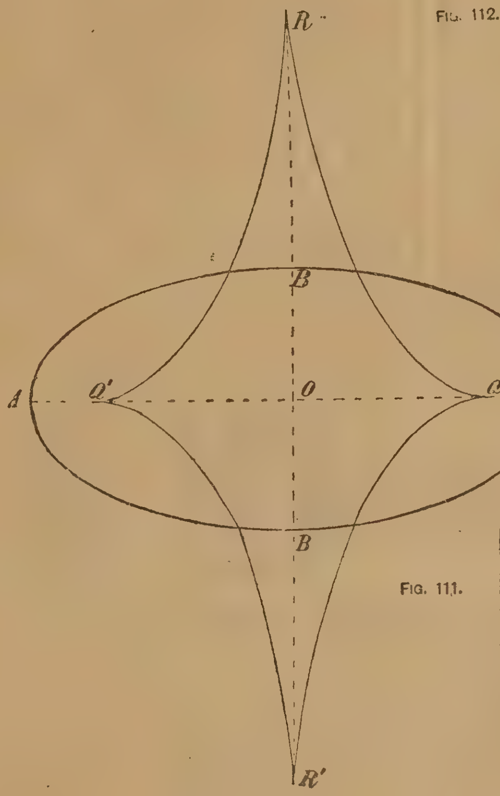


FIG. 111.

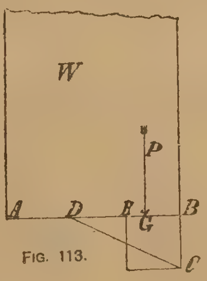


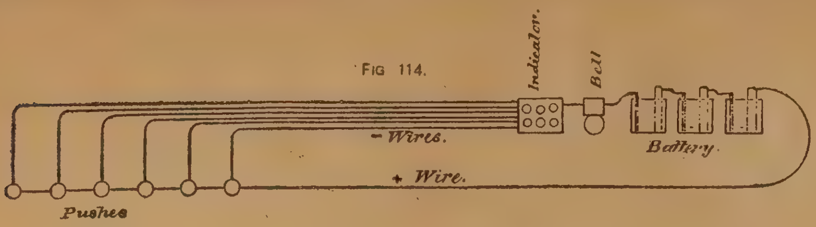
FIG. 113.

cuts the ellipse at right angles, is a tangent to the evolute. The equation to the evolute is $(ax)^{\frac{2}{3}}+(by)^{\frac{2}{3}}=(a^2-b^2)^{\frac{2}{3}}$. From this equation the four points Q¹, R, A, R¹ are easily found, A Q¹ $= \frac{b^2}{a}$ and B R¹ $\frac{a^2}{b}$. Other points may also be found, but it is not an easy curve to plot. Fig. 112 is intended to compare the curve of the evolute with that of an ellipse whose vertex is at the focus S, where O S is a tangent to it; the line O S is equal to its semi-minor axis and O T is equal to its semi-major axis—$\frac{OS}{OT}=\frac{b}{a}$. For accurate work the curve Q¹ R¹ should be determined by a few points and used for drawing the normals, but it will be generally found sufficient to use the ellipse shown by the dotted line S T as was done in Fig. 20.

79. In regard to the rule as to the centre of pressure not passing outside of the middle-third of the line showing a cross-section of a voussoir joint (paragraph 20), it appears to be taken for granted that this is a rigid rule and that neither in the case of a wall or buttress subject to side thrust nor in arch sheeting must the line of centre of pressure pass outside the middle-third. Suppose Fig. 113 to represent the cross section of a wall resting on a horizontal bed A B. The centre of pressure is at G, and suppose the direction of the pressure to be nearly vertical. Suppose P = pressure per unit of length of wall. Take B C to any scale to represent the pressure per unit of area that the material is calculated to safely bear. Take E so that B C × E B = P, make B D = 2BE; join D C. Now, wherever D may fall between A and B the structure will be safe so long as the point where P meets the joint is not less than $\frac{BD}{3}$ from B. If we consider the *strain* along D B we may conceive the joint at A as gaping very slightly, but the structure will be safe. If D passes to the left of A it shows that the material of the wall would be overstressed with the proposed load.

80. The question of revetement walls has not previously been dealt with. This is not a question that can be settled by mathematics: when it is attempted to so treat it the assumption is made that the material to be retained is homogeneous and that it has a definite angle of repose. Such a condition is rarely met with in practice. No doubt the attempt to calculate the limited question is of value, but each case, where masses of earth have to be retained in undisturbed position, must be dealt with after examining the special conditions very carefully. In some cases it will be found that masses of earth tend to move on "backs" of smooth rock steeply inclined and exert very great pressure on revetement walls. In most cases economy in the wall will result from careful attention to drainage so as to have the material close to the wall dry. If loose stones are available they are

FIG 114.



almost as valuable when well packed between a retaining wall and the bank as if the wall had the additional thickness.

Sufficient openings must be provided to let the water pass through the wall from behind. It should be remembered that the slopes of earth cuttings should be drained by drains which run down the steepest angle of the slope; any cutting across the slope is bad; the surface between the drains may be dressed with a fall to the drains, showing like wide old-fashioned corn ridges. The toe of a retaining wall must have a sufficient hold in the ground to prevent it sliding outwards. Filled earth, as a rule, stands at a slope of 1 to 1, and a wall to retain such earth may be built as calculated to support a wedge whose lowest edge (or point) has a dihedral angle of 22½ degs. The advantage in battering a retaining wall may be suggested by considering the material standing at its natural slope. The wall is needed only as we steepen the slope: in all cases the wall may be built thinner at the top than at the bottom. It is often advisable to step the wall at the back and thus avoid battering it in front. It may require to be built heavier in this way, but some saving (in curved wing walls of bridges and similar works) may result from simplification of the connections with end pillars and abutments, &c., as compared with battered work.

HOUSE-BUILDING (*continued*).

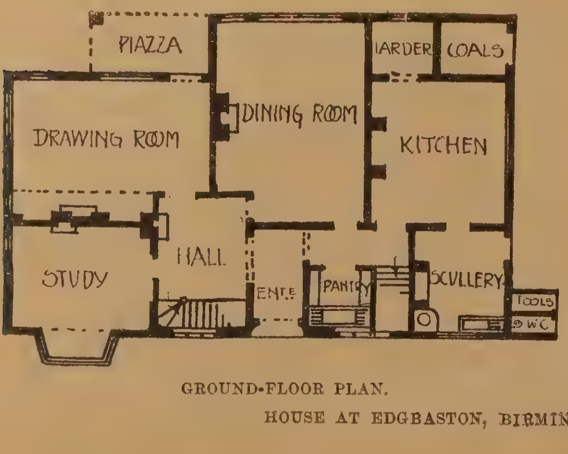
81. The use of electricity for household purposes is now so extended that the constructor of houses cannot afford to ignore the arrangements made necessary for its various uses. There are a few simple things which it is necessary to know about electricity: certainly the student of Building Construction should know this minimum. For domestic purposes electricity rings bells, works telephones, produces light, works ventilation fans, &c., and by some advanced enthusiasts it is used for cooking and warming.

82. *Electric Bells.*—The items in a bell installation are (*a*) the battery, (*b*) the wires, (*c*) the pushes by which a circuit is completed by bringing the two ends of a wire together, (*d*) the bell, (*e*) the indicator. The battery is the place where the electricity is generated or created; the most usual form of battery is called the Leclanché. Each cell consists of four parts, namely, an unglazed cylindrical earthenware pot sealed at the top with black material out of which stands a piece of lead to which a wire may be attached by means of a brass screw; a rod of zinc with a piece of wire soldered on to it; a glass jar in which the pot and rod stand; and the solution of sal ammoniac which is filled into the glass jar and is the means of communication between the conductor inside the pot and the zinc rod. If there are long distances a number of "cells" will be required because the pressure (voltage) is increased by increasing the *number* of cells. If the pushes are numerous—that is, if the call upon the battery is frequent—the cells should be of a large size. The bell is a mechanical arrangement such that when it is included in an electric circuit the bell rings. The "indicator" is a mechanical arrangement for showing to a servant which push is being pressed that is causing the bell to ring. The student should examine these things in an actual installation. Let him note particularly how several cells forming a battery are connected. Let him think of a current of electricity as always making a *complete* circuit: the circuit is complete through the battery, the bell, the indicator. The small gap is at a push: the moment this gap is closed by pressing the push the current flows; the moment the thumb is taken off the current ceases. If there were no liquid in the battery the current could not flow (so-called dry batteries are not quite dry), and if the conducting wires carried along walls, &c., were quite dry and insulated there would be no leakage, that is, there would be no current flowing except when a push is pressed. Now when any current is flowing there is chemical action wherever the current is carried by means of liquid or moisture; in the battery the zinc wastes away: if there is leakage by reason of dampness of walls or otherwise there is a waste of one wire, and it is most important for success in electric-bell fitting that there shall be no corrosion of the wires. In books of instructions for electric-bell fitting this point is not sufficiently emphasised, and it is very important. The ordinary wire supplied for electric bells is not sufficiently protected for most houses. What I will call the positive wire, *i.e.*, the wire which comes from the top of a "porous pot," should be well insulated, and it should be run where there is no risk of damp of any kind getting to it. Fig. 114 is a diagram showing how a bell circuit should be arranged.

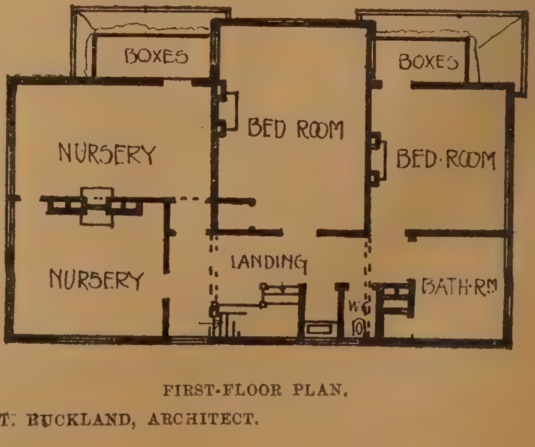
83. *Electric Supply.*—Just as for the specifying of arrangements for the supply of gas to a building the architect is not necessarily a chemist, so it is not necessary for him to be an electrician or an electrical engineer to control the electrical fitting of a house for lighting and other purposes. The use of electricity is so common, however, that everybody ought to know its common qualities. Electric supply companies—or the electric authority—put in the "service." It has to be settled where the meter is to be stationed, and just as in a gas service there is a main cock on the street side of the meter so in an electric service there is a main switch of sufficient size to serve for the maximum current which can be demanded at any one time in the house. A switch is a means of connecting and disconnecting conductors—"wires." Suppose the *service* consists of two conductors; it will be found on trial that if the two ends of a lamp filament are connected with them the lamp will glow, and if these wires are carried over the house, lamps whose terminals are attached metallically one to each wire will glow. If instead of putting a lamp across the wires a piece of wire smaller than the service wires is placed across them, this piece of wire will be instantly and violently destroyed by heat, and if the applied piece of wire is thicker than the service wires the service wires will be destroyed, and in either case an electrical man will tell you that you have "shorted" the circuit. It is very undesirable to have a "short" of such a kind as that the permanent wires or cables conveying electricity will be damaged, and to prevent injury of this kind what are called "cut-outs" are made use of; therefore, besides having a main switch on the street side of the meter there is also a main cut-out. A cut-out is essentially a piece of conductor much smaller in section than the conductor in a gap of which it is placed; in the event of, from any accidental short occurring in the house, danger to the service wires the *cut-out* will be destroyed and the connection broken. The cut-out is an automatic switch which breaks the circuit if owing to accident in the house a dangerously large current is set up in the service cables. The essential part of the cut-out is the piece of fine wire, but this piece of wire must be of sufficient length so that when it is burnt out the current will not continue to flow (as it does in an arc lamp) across between two separated points; it must also be mounted so that the heat from its destruction shall not set fire to the building, and it must be easily renewable. The student ought to examine for himself a main switch and cut-out. The reason why an electric current flows from one conductor to another is that there is a difference of pressure or potential between them, and this difference of potential is sometimes called polarity. What is called a "double pole" cut-out is one in which there are two cut-out conductors; that is, mounted on the same porcelain or slate base there are two of these fine pieces of wire, and both of the service wires are brought to the piece of apparatus and they are passed through it by means of these fine wires. This is an extra safe arrangement, and it should always be adopted. There is also a double-pole switch, which is a double switch making and breaking contact at both poles or conductors simultaneously. What is called the quick break of a switch is to prevent what is called arcing. When a break takes place an arc is formed between the parts of the switch, and it continues till the distance between them exceeds the arcing distance; the arc should have as short a duration as possible.

(*To be continued.*)

House at Edgbaston, Birmingham.—This house was built for the architect's own occupation about a year ago. It contains three sitting-rooms, four bedrooms, two attics, bathroom, &c. The site was formerly a gravel pit, and the old banks are now thickly covered with gorse and broom which form a pleasing background for the house when seen from the road. The exterior is treated entirely in rough-cast and the roof is of brindled tiles; the windows are casements and frames. It is a comfortable abode in winter, as all the flues are on internal walls, and thus help to keep the house warm.

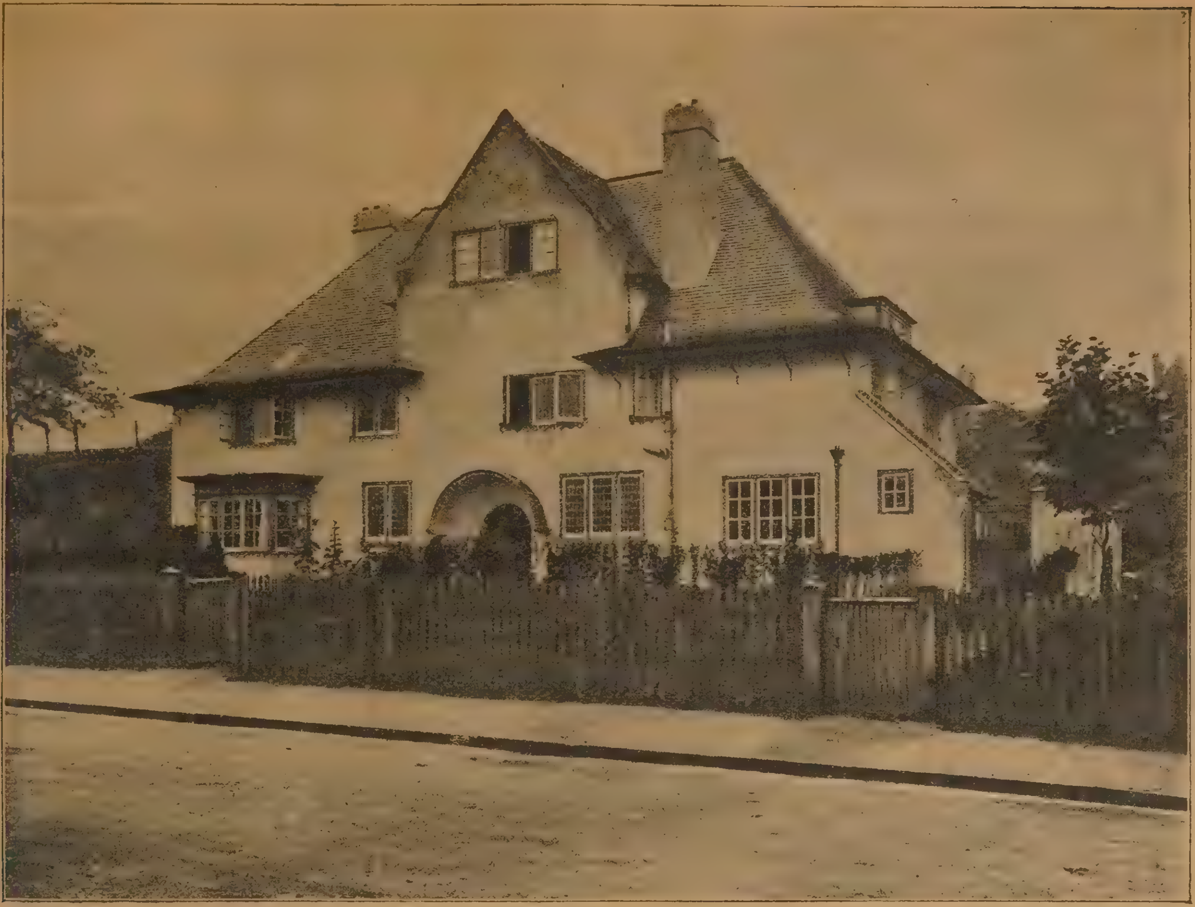


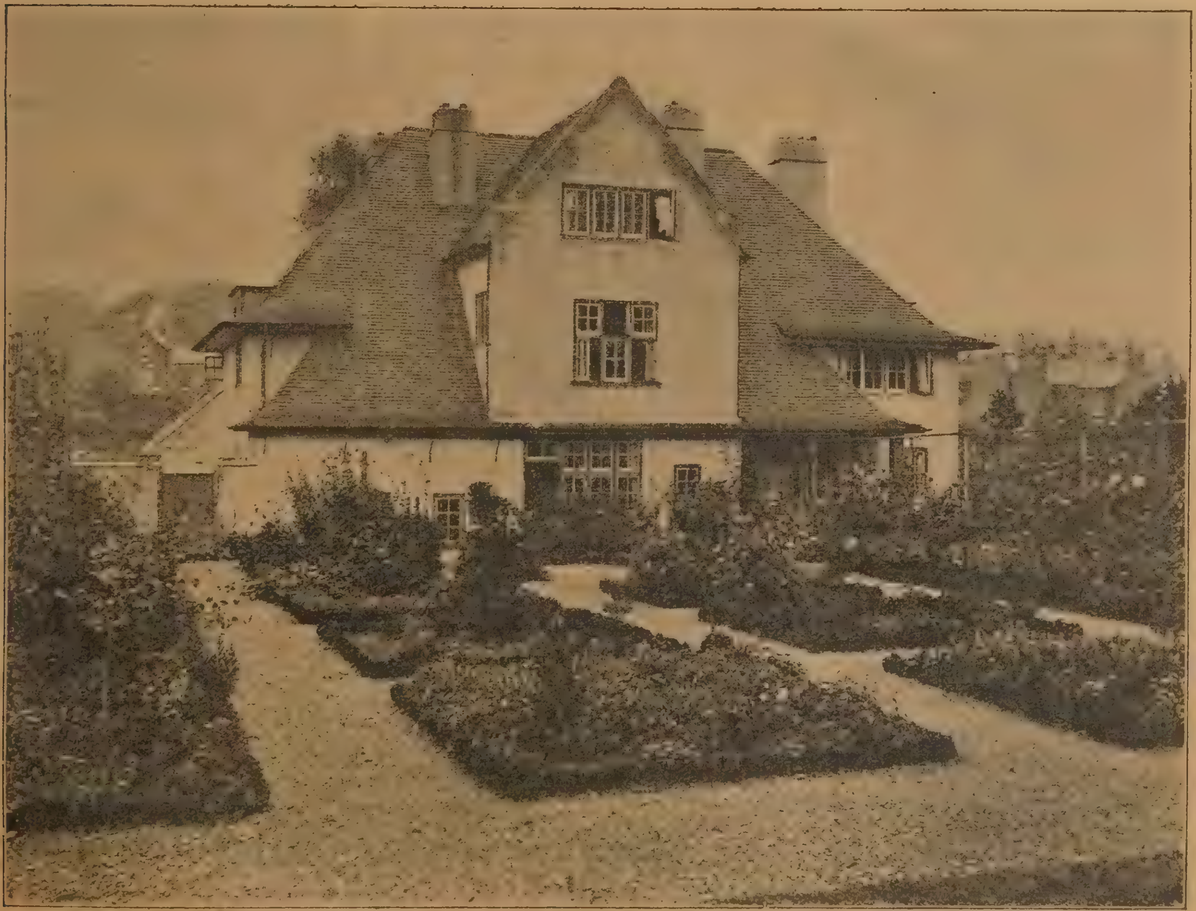
GROUND-FLOOR PLAN.



FIRST-FLOOR PLAN.

HOUSE AT EDGBASTON, BIRMINGHAM. HERBERT T. BUCKLAND, ARCHITECT.





HOUSE AT EDGBASTON, BIRMINGHAM. HERBERT T. BUCKLAND, ARCHITECT.

Builders' Notes.

The Weston-Super-Mare Master-Builders' Association held its annual dinner last week, Mr. C. Addicott presiding.

The Bristol Master-Builders' Association held its annual dinner last week. The president, Mr. E. Walters, occupied the chair.

Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, has been nominated an Honorary Corresponding Member of the Imperial Federation of Fire Brigades in Austria (Oesterreichischer Feuerwehr - Reichsverband) as a mark of esteem, and similarly the Royal Italian Fire Brigades Association asked Mr. Sachs to accept a similar distinction. The Belgian Fire Federation also recently elected Mr. Sachs to be an Honorary Corresponding Member.

The Wakefield and District Master-Builders' Association held its annual meeting recently, Councillor Judge presiding. Councillor Judge was re-elected president for the ensuing year; Mr. J. Bagnall, Mr. H. Fallas, Mr. G. Crook and Councillor Driver were elected vice-presidents; and the following members were elected on the committee as representatives of the several branches of the trade:—Bricklayers and masons—Messrs. C. S. Denison, E. A. Elvey, J. B. Hesling, J. Higgins and T. Lee; joiners—Messrs. J. W. Atkinson, H. Blackburn, J. E. Bramald and J. Johnson; plasterers—Messrs. J. W. Sanderson and Mr. T. E. Senior; plumbers—Alderman Atkinson and Mr. W. H. Moss; slater—M. E. Rycroft; and painter—Mr. G. R. Parker.

The Brighton Master-Builders' Association held its annual dinner last week, Alderman W. Botting, J.P., presiding, who in replying to the toast of "Continued Success to the Association of Master-Builders" referred to a resolution passed by the National Association of Master-Builders deciding to abolish rules in all workshops throughout the building trade, so that the master should be really the master and the only consideration in engaging workmen should be a fixed wage for certain work. He believed it would be for the benefit of the building trade generally, and also for the workmen, that workshop rules should be done away with, because through them it had become almost impossible for master-builders to carry on under existing conditions. Lately legislation had gone much in their favour, boycotting and picketing being now illegal.

London County Council.—At last week's meeting of the Council the Finance Committee brought up their half-yearly statement of works completed by the Works Department during the half-year ended September 30th, 1901. The statement covered twenty-one estimated works. The final estimate for these works was £103,620, and the actual cost £118,162, being an excess of £14,541. The chief loss was shown on the execution of some drainage works in North Woolwich. The final estimate for this was £47,683, whilst it actually cost £64,398, or £16,714 above the estimate. There were losses on a few of the other works, whilst on thirteen there were savings amounting to £2,434, leaving the balance of loss as stated. Since the creation of the Department in 1893 the works carried out have cost £78,844 above the final estimates. The jobbing works show a small balance of cost below schedule value. In the case of the drainage work in North Woolwich, the Main Drainage Committee brought up a long explanatory report and recommended the Council to pass a vote of £13,000 to cover the extra cost of the work. Mr. Beachcroft said that he had not the slightest hope for the Works Department. He referred to the investigation into the Department held six years ago, and said that the report of the minority, who said that the Department would never be a success when carried on by a board or a committee instead of by the engineer or architect, had been amply justified. With the present facts staring them in the face their best course would be to abandon the Department altogether. He had never read so condemnatory a report on any work as that of their engineer on the North Woolwich drainage. After considerable discussion the amendment to refer the matter back to the Committee was rejected and the excess vote of £13,000 passed.—The Council decided that their resolution of October 15th, 1901, conditionally approving the means of escape in case of fire proposed to be provided in pursuance of section 63 of the London Building Act, 1894, on the top storey of a block of offices known as Finsbury Pavement House, Finsbury Pavement, be modified by the substitution of the words "South Place staircase being shut off from the corridors on all floors by self-closing swing doors of deal, 2in. thick, with the upper panels glazed in small squares with $\frac{1}{4}$in. plate glass, except where there are existing swing doors across the corridors next this staircase" for the words "approaches to the corridors where they adjoin the staircases being fitted on every floor, including the basement floor, with self-closing fire-resisting doors so as to prevent smoke or flame passing into the staircases."

Correspondence.

A Zulu Hut.

To the Editor of The Builders' Journal.

Exeter.

Sir,—It may be interesting to note, in reference to the illustration published in your last issue of two natives building a hut in Zululand, that when on a holiday tour in that country three summers ago I learned that the kraals, as shown, have a working life and an actual existence of from ten to twenty years, after which they have to be rebuilt. I noticed that the homes of the natives in different parts of South Africa are by no means alike in construction. Those of the Zulus—as illustrated—remind one somewhat of the sort of places I have visited in the Arctic regions—the encampments of the Laps. But in Bechuanaland, away more to the north-west of South Africa, the walls around—circular on plan—appear to be made of clay and cow-dung; the whole covered by a thatched roof. That a sense of and an unconscious desire for ornamentation exists in the savage breast is pleasantly illustrated by the many *sgraffito* designs, often of most quaint conception, that appear to have been scratched upon some of these mud walls whilst in their wet state.—Yours truly,

HARRY HEMS.

"Papyrolith" and Cork Paving.

To the Editor of The Builders' Journal.

Town Hall, Ilfracombe.

Sir,—Some time ago a flooring material called "Papyrolith" was brought to my notice. It was made of an asbestos composition of a warm chocolate colour which was to be laid *in situ*. Though I have corresponded with some of the largest builders' merchants in the West of England I have failed to find the address of the firm who make or supply this material, and should feel obliged if any of your readers could furnish me with this information. While on the subject I am desirous of learning the address of a firm making cork-paving in blocks. I understand that the Improved Cork Pavement Co., formerly of 21, St. Mary Axe, E.C., has discontinued business.—Yours truly,

OSWALD M. PROUSE, A.M.I.C.E.

Old London Bridge.

To the Editor of The Builders' Journal.

London, E.C.

Sir,—Those of your readers who were interested in the illustrated article on "Old London" in your last issue may like to know that of the alcove shelters shown in the view of the Southwark end of London Bridge as it stood in 1831 two are preserved and form shelters at the east end of Victoria Park, London. They each bear this inscription: "This alcove, which stood on London Bridge, was presented to Her Majesty by Benjamin Dixon, Esq., J.P., for the use of the public and was placed here by the Right Honorable W. Cowper, First Commissioner of Her Majesty's Works and Public Buildings, 1860."—Yours truly, ARTHUR HARSTON.

Keystones.

Change of Address.—Mr. Frank Windsor, architect and surveyor, has removed to new offices at 9 and 10, Bank Buildings, George Street, Croydon.

A New School at Ellesmere Port has been erected to accommodate 200 boys. The cost of the building, excluding furniture, has been about £1,700. Mr. G. R. Jebb was the architect, and Messrs. E. Griffiths & Co. were the contractors.

The New Oak Chancel Screen in the Church of St. Matthias, Earl's Court, referred to on p. 441 of our last issue, was executed at a cost of £380 by Messrs. Harry Hems & Sons, of Exeter, who also erected a sculptured oak pulpit in the church a few months ago.

At Queen Anne's School, Caversham, a new wing has been erected. It contains a residence for the head mistress and an assistant mistress, two pupils' rooms, dormitories for thirty pupils arranged in cubicles, three bathrooms, lavatories and offices, and in the basement are fireproof cellars for hot-water furnace, heating apparatus, &c. This wing is connected to the main building by a wide corridor. Messrs. G. Lewis & Brother, of Reading, were the contractors, and Mr. J. Osborne Smith, F.R.I.B.A., of Westminster, was the architect.

A Memorial to Ruskin in Westminster Abbey was unveiled by Mrs. Arthur Severn on Saturday last. It takes the form of a bronze medallion by the late Mr. Onslow Ford, R.A., and occupies a position in the Poets' Corner, immediately above the bust of Sir Walter Scott. The medallion has cost £263 10s. and its fixing £5: but there is the most startling addition of "Westminster Abbey fees—£201 1s."! Ruskin was born on February 8th, 1819, at 54, Hunter Street, Brunswick Square, W.C. (now marked by a Society of Arts plaque), and died at Coniston on January 20th, 1900.

A Memorial at Addiscombe, Croydon, is being erected to the brave men who were trained for Indian service at the old East India Company's Military School for Officers. The Institution sent out 3,000 men between the years 1809 and 1861 to fight the battles of their country. The memorial takes the form of a church, on a site near the spot where the Cadets' Training School formerly stood. It was dismantled when need for it ceased, owing to the Imperial Government taking over the defence of India and its general administration. The church, according to the completed design, will cost £11,000. The present scheme embodies a substantial portion, involving an expense of £6,600.

New Parochial Buildings for St. Stephen's, Newcastle, have been erected in Tulloch Street. Mr. S. D. Robbins, architect, Newcastle, designed the building, which is Gothic in style; it has been erected by Messrs. T. & R. Lamb. The site is 92ft. long and 70ft. wide. The principal room on the ground floor is the parish hall, in which there is seating accommodation for about 600 persons. Adjoining are classrooms and a committee-room, &c. On the mezzanine upper floor there are also classrooms. The wood flooring has been provided by the Acme Flooring Company, of London; the plasterwork by Messrs. W. B. Wilkinson & Co., of Newcastle; and the steam-heating by Messrs. Ashwell & Nesbit, of London. Mr. Michael Stevenson acted as clerk of the works.

A City Churchyard.—The alterations in connection with the churchyard at St. Andrew-by-the-Wardrobe, which is situated next to the Bible Society's premises in Queen Victoria Street, E.C., have now been completed. In place of the high and ugly blank wall, new wrought-iron railings and stone piers with carved vases have been erected. The wrought-iron gates are given by Mrs. Banister Fletcher in memory of her late husband, who was churchwarden. The churchyard has been laid out in terraces and covered with turf, exposing one of the best of Wren's churches to public view, and adding another green spot to London's dingy exterior. The work has been designed and carried out under the superintendence of the architects, Messrs. Banister Fletcher & Sons.

A New Fish Market and Coaling Stage at Swansea has been erected at the Prince of Wales's Dock at a cost of £20,000.

The R.I.B.A. Annual Dinner, 1902, will be held in the Whitehall Rooms of the Hotel Métropole on Thursday, June 19th.

Isolating the National Gallery.—It is expected that the premises needed for the isolation of the National Gallery will be demolished this summer.

A New Public Library at Hampstead has been opened at Cotleigh Road by the Hampstead Borough Council to replace a temporary one at Priory Road.

Sculpture for a French Bridge.—The sculptor, Corneille Theunissen, who has been lately decorated with the Cross of the Légion d'Honneur, is engaged in the creation of four allegorical figures destined to ornament the new bridge over the Somme at the entrance of the old town of Saint Quentin.

A New Infirmary and Tramp Wards at Solihull, part of the scheme proposed a few years ago for the reconstruction of the workhouse, has been opened. The work has been carried out by Messrs. W. & T. Thompson, builders, Solihull, to the designs of Mr. W. H. Ward, architect, of Birmingham.

A New Church at Camberley is to be erected from designs by Mr. W. D. Caröe. At present it is intended to erect the nave only, to seat 300 persons, at a cost of £2,200. Over £3,000 additional will be required to complete the entire structure, when accommodation will be provided for 500 persons.

An Architectural Competition for Students.—The Alexander Thomson Travelling Studentship, value £60, will be held this year for the ninth time. It is a triennial one. The drawings are to be sent in by Friday, December 26th. The programme consists of (1) restoration of the Tower of the Winds at Athens, and (2) design for a building to accommodate the Fine Art Department of a University. The Trustees have resolved to offer a second prize of £20 should the quality of the work and the number of competitors warrant this. Competitors must be between eighteen and twenty-five years of age, natives of and resident within the United Kingdom. Detailed programme and conditions may be had on application to Mr. C. J. Maclean, 115, St. Vincent Street, Glasgow.

A Memorial to the late Lord Armstrong is proposed to be erected in Newcastle-on-Tyne and is to include a portrait statue. The committee invite designs for the memorial, which must be suited to the site and climatic conditions of the city. The statue itself, it is suggested, should be of bronze and form the most prominent feature. Competitors must be prepared to carry out the memorial, including its erection and accessories, at a cost of about £5,000. Mr. Alfred Gilbert, R.A., will act as assessor or adviser, Three competitors at least will be asked to carry their designs further, and they will each receive an honorarium of £25. The second and third best designs will receive £75 and £50 respectively. All designs should be ready by June 1st. Further particulars can be obtained from Mr. Herbert J. Richardson, 67, Westgate Road, Newcastle-on-Tyne.

Partnerships Dissolved.—The partnership between Messrs. Albert Edward Pridmore and Andrew Whitford Anderson, carrying on business as architects and surveyors, at 28, High Street, Watford, Herts., under the style or firm of Pridmore & Anderson, has been dissolved from December 31st last. Mr. Albert Edward Pridmore will henceforth carry on practice at "Cheylesmore," Park Road, Watford aforesaid, and at 2, Broad Street Buildings, London, E.C., and Mr. Andrew Whitford Anderson at 28, High Street, Watford.—The partnership between Mr. John Henry Burton, of Warrenlea, in the county of Lancaster, and Mr. Joseph Ashton Percival, of Oldham Road, both of Ashton-under-Lyne, practising as architects and surveyors, at Ashton-under-Lyne, under the style or firm of "J. H. Burton & J. A. Percival," was dissolved from December 20th last, by the death of Mr. John Henry Burton; and in future the business will be carried on by Mr. Joseph Ashton Percival under the style of "J. H. Burton & J. A. Percival."

The R.I.B.A. Annual Exhibition of Designs and Drawings, held from January 14th to 25th last at the Alpine Club, Savile Row, was visited by nearly a thousand persons.

A Statue of Shakespeare is proposed to be erected in Rome by the side of those of Goethe and Dante in token of gratitude to Great Britain for preserving the Italian tongue in Malta.

A New Methodist Chapel at Highbury Vale, Bulwell, has been erected at the junction of Clarges Street and Broomhill Road. Messrs. Herbert Ingham & William Pipkins, of Basford, were the contractors, and Mr. J. R. Swift, of Arnold, was the architect.

The Coronation Decorations.—We are asked to announce that His Majesty the King has been pleased to accept a copy of the current issue of THE ARCHITECTURAL REVIEW containing the coloured scheme of decoration for the Coronation route suggested by Mr. Selwyn Image.

A New Station of the Metropolitan Fire Brigade has been opened in West End Lane, Hampstead. The new station has been erected at an outlay of between £11,000 and £12,000, exclusive of the cost of the site. It is one of the four new stations which have been completed in the outer fire circle of London. All the latest improvements have been introduced; electric light has also been provided. An important feature of the station is the increased accommodation for the staff, provision having been made for housing twelve men and their families.

The Extension of Paris.—The levelling of that portion of the fortifications of Paris which extends from the Seine at Auteuil to Saint Denis, and which has been talked of so long, seems to be on the point of realisation. By it the city of Paris will be increased by the addition to its area of the Bois de Boulogne, and all the various suburban districts existing between the present City walls and the Seine. The value of the wall and moat round the city as an effectual means of defence is contested by high military experts.

"Some Aspects of Art and of Modern Life" was the title of a lecture by Mr. Selwyn Image at the Working Men's College last Saturday. Individual buildings, he said, however fine were not enough to compensate for the fact that our ordinary architects and builders were deficient in the qualities necessary to the construction of a building artistically decent, let alone fine. The recent modernizing of the houses in Bloomsbury Square and the transformation of Russell Square had destroyed the character and proportions of house fronts, which, if plain, had had artistic quality.

A New Reredos in Downend Church is being erected as a memorial to the late Mrs. Skelton. It has been designed and executed in the studio of Mr. Frank Bell, in College Green, Bristol. The reredos has been kept in harmony with its surroundings. The design consists of two flat panelled wings flanking an elaborate and buttressed centre-piece, which rises above them, and contains two foliated panels and the arched head of the central recess. A bold enriched moulding, supporting a pierced cresting, surmounts the whole. Late Gothic is the general style of the work, which is executed in specially-selected oak, oiled, but left uncoloured.

The Society for the Preservation of "Vieux Paris" continues its efforts to save for posterity as many relics of the past as possible. Very soon there will be little left of the old city. The latest treasure rescued from the destroyer is the ancient Hôtel des Miramionnes, 47, Quai de la Tournelle. It is one of the most picturesque houses on either side of the river, and contains a fine staircase, quaint rafters and windows, while on the ground floor there is a seventeenth-century chapel which has guarded its rare woodwork and monotone paintings. The fine garden was designed by Le Notre, and the trees date from the time of Louis XIV. The hotel was built for a convent, but the Revolution came and the sisters were turned out, the house afterwards being used as a hospital dispensary. The building in all likelihood will be transformed into a museum.

New Companies.

Alteryn Brick, Tile and Terra-cotta Works, Ltd.

Registered to acquire the business of a brick, tile and terra-cotta manufacturer, now carried on by Jesse Davies at Alteryn, near Newport, Monmouth; and to carry on the business of manufacturers and sellers of bricks, tiles, pipes, terra-cotta, pottery, earthenware, enamelled glazed goods, sanitary ware, &c. Capital £3,000 in £1 shares. The first directors are T. Goldsworthy, Henry P. Davies, Edgar Williams and Jesse Davies (managing director). Registered office: Bangor Wharf, Newport, Monmouth.

City and Counties Estates, Ltd.

Registered to acquire lands, buildings and property of whatever tenure, in the City of London or elsewhere, and to develop, deal with and turn to account the same in such manner as the company shall see fit; as builders and contractors; to advance money to builders and contractors, tenants and others. Capital £30,000 in £1 shares.

The Clyde Quarries, Ltd.

Registered to carry on the business of quarry-masters. Capital £10,000 in £1 shares. Registered office: 37, Church Street, Dumbarton.

T. Emlyn Jones, Ltd.

Registered to adopt an agreement made with T. E. Jones for the acquisition of the business carried on by him at Glebe Street, Penarth, and to carry on the business of general and furnishing ironmongers; as plumbers, gasfitters, bell-hangers, electricians, electrical engineers, general house furnishers, merchants and contractors, Capital £15,000 in £1 shares. Registered office: 30, Moorgate Street, E.C.

Empire Enamel Co., Ltd.

Registered to acquire the business of the Empire Enamel Co. as carried on at 101, Redcross Street, Southwark. Capital £6,000 in £1 shares. The directors are E. J. Crosier, J. Dixon and S. Wilkinson. Registered office: 101, Redcross Street, Southwark.

Fal River China-clay Co., Ltd.

Registered to adopt an agreement with A. H. Moore and others for the acquisition of certain patents, and, generally, to carry on business as manufacturers of and dealers in bricks, tiles, china, stone, glass, earthenware, porcelain and other products. Capital £30,000 in £1 shares. The directors are J. H. Calvert, F. R. Andrews, W. A. Dow, H. A. H. Moore and H. P. Calvert.

Foxon, Haggie & Co., Ltd.

Registered to acquire the business carried on by Foxon, Robinson & Co., Ltd., at the Baltic Sawmills, Sheffield. Capital £30,000 in £10 shares. The directors are J. D. Foxon, J. D. Haggie and C. S. Merrill. Registered office: Baltic Sawmills, Colver Road, Sheffield.

W. Franklin & Sons, Ltd.

Registered to acquire the business carried on by W. Franklin, builder and contractor, at Devonshire Place, Newcastle-on-Tyne. Capital £3,000 in £1 shares. The directors are W. Franklin, W. W. Franklin and F. Franklin.

Gas Extension Contracting Co., Ltd.

Registered to adopt a certain agreement for the acquisition of certain inventions relating to (1) a new atmospheric gas burner which can be used in various ways, (2) a new stove in which the same is used, and (3) a new apparatus for the consuming of smoke from coal fires by the use of gas. Capital £6,000 in £1 shares. The first directors are T. R. E. Branston (managing director) and Colonel A. F. Budden.

C. Harrison & Co., Ltd.

Registered to acquire as a going concern and carry on the business of sand and gravel merchants and brick and tile makers at the Merrill's Bridge Brick Yard, West Street, Crewe, Chester, as C. Harrison & Co.; and to carry on business as stone merchants and masons, general merchants, dealers in slates, timber, hardware and all kinds of building materials, and any other business which can be carried on in connection with the above. Capital £2,500 in £1 shares. Registered office: Merrill's Bridge Brick Yard, West Street, Crewe, Cheshire.

Institute of Sanitary Engineers.

Registered with 100 members, each liable for the sum of £2 in the event of winding up. The directors are H. Dove and James Farley.

International Incandescent Light Co., Ltd.

Registered to carry on the business of dealers, makers and merchants of all kinds of accessories for incandescent light, and to acquire the business, property and liabilities of any persons carrying on a similar business. Capital £1,000 in £1 shares. The first director is Charles Welsh. Registered office: 13, Basinghall Street, E.C.

Charles Lathe & Co., Ltd.

Registered to acquire from Charles Lathe the business carried on by him at the Moat Foundry, Summerhill, Tipton, Staffordshire, and to carry on the business of a range, grate and stove manufacturer, makers of grills, mantels, overmantels, tailors' stoves, ovens, &c. Capital £15,000 in £1 shares. The first directors are C. Lathe, A. Lathe and C. E. Lathe. Registered office: 66, Upper Church Lane, Summerhill, Tipton, Staffordshire.

MacLeish, Morrison & Co., Ltd.

Registered to acquire and carry on the business of sanitary engineering of James MacLeish, Mill Street, Perth. Capital £15,000 in £1 shares.

Merton Park Estate Co., Ltd.

Registered to acquire, deal in and with any lands, estates, real or personal property, by laying-out and preparing the same for building purposes, building thereon, planting, paving, draining, farming, cultivating and to advance money to builders, contractors, &c.; to erect clubs, hotels, gas and water works, drainage systems, sewage farms; also as builders and contractors, decorators and merchants of and dealers in stone, sand, lime, bricks, timber, hardware and other building requisites, brick, tile and terra-cotta makers, &c. Capital £175,000 in £1 shares. The first directors are J. Innes, W. E. R. Innes and F. G. Courthope.

Moss & Plumb, Ltd.

Registered to acquire the business carried on by W. Moss & A. Plumb at Hucknall Torkard, Notts, and to carry on the business of timber merchants builders and contractors and dealers in building materials, sawmill proprietors and quarry owners, manufacturers of bricks, tiles, pipes, pottery and earthenware, and as carpenters, joiners, paviors and manufacturers of and dealers in artificial stone. Capital £7,000 in £1 shares. Registered office: Papplewick Lane, Hucknall Torkard.

Norfolk Stone Co., Ltd.

Registered to acquire certain patents relating to the manufacture of stone, marble, cement, bricks, pavement, artificial stone, &c., from A. Crundall. Capital £20,000 in £1 shares.

William Oliver & Sons, Ltd.

Registered to acquire the business of timber and fancy wood merchants now carried on by Thomas Oliver as William Oliver & Sons; and to carry on business as merchants of and dealers in wainscot, mahogany, hardwood, fancy-wood veneer and timber; as sawyers and sawmill proprietors, cabinetmakers, joiners, carpenters, woodworkers, packing-case and box makers, makers of and dealers in fittings, fixtures and furniture of every kind, &c. Capital £100,500 in 20,000 £5 preference and 10,000 1s. ordinary shares. The directors are T. Oliver (chairman), E. T. Oliver, J. E. Oliver, D. W. Oliver, H. M. Oliver and S. Oliver. Registered office: 120, Bunhill Row, E.C

Southern & Nephew, Ltd.

Registered to acquire the business carried on at the Collier Street Sawmills, Knott Mills, Manchester, by R. W. Southern & Nephew, and at the Ellesmere Street Sawmills, Hulme, Manchester, as the Ellesmere Street Sawmill Co., and to carry on business as timber merchants, sawyers, packing-case makers, dealers in woodwork of every kind for builders and contractors; as decorators, painters, plumbers, joiners, glaziers' merchants, dealers in building materials, &c. Capital £30,000 in £1 shares. The directors are R. W. Southern (governing director), G. L. Darwent, S. Lill and J. Lill. Registered office: The Collier Street Sawmills, Knott Mill, Manchester.

St. Margaret's Bay Preservation and Development Co., Ltd.

Registered to purchase on lease or otherwise lands and buildings at St. Margaret's Bay, and to erect or construct in and about St. Margaret's Bay breakwaters, groynes, sea walls, and other works and erections. Capital £2,000 in £25 shares. The directors are H. J. Bakewell, R. C. Darwall and W. H. E. Thornthwaite. Registered office: Fuerteventura, St. Margaret's Bay, near Dover.

Tabor, Trego & Co. (1902), Ltd.

Registered to acquire the business carried on by Tabor, Trego & Co., Ltd., at 42, New Broad Street, London, and at Bow Common, Middlesex, and generally to carry on the business of varnish, japan and colour manufacturers. Capital £87,500 in 80,000 preference shares of £1 each and 150,000 ordinary shares of 1s. each. Registered office: 42, New Broad Street.

George Townend & Son, Ltd.

Registered to acquire the business of cabinet makers, carpenters, joiners, builders, contractors, and painters and decorators as carried on at Halifax, Yorkshire, by David Hanson & Co., Ltd., as George Townend & Son. Capital £10,000 in £1 shares. The directors are D. Hanson, A. Hind, J. Baxter, P. M. Granger and R. Merrall. Registered office: Green Lane, Halifax, Yorkshire.

Unlimited, Ltd.

Registered to carry on the business of a land development company; as builders and contractors, auctioneers and surveyors, decorators, stone merchants, dealers in sand, lime, brick, timber and hardware. Capital £10,000 in £1 shares.

Wear and Portland Cement Co., Ltd.

Registered to carry on business as cement makers as carried on by Mattison & Chapman, and to carry on the business of manufacturers of and dealers in cement, clay, chalk, timber, coal, &c. Capital £25,000 in £10 shares. The directors are H. Webster, W. Sewell, J. Short and R. Thompson.

Surveying and Sanitary Notes.

Safety "Islands."—The Municipal Art Society of New York is holding up London as a model for the Municipal Government to follow in establishing safety "islands" in the middle of streets for the convenience of pedestrians. In order to convert public opinion the society intends to erect such an "island" in one of the busiest parts of the town, and hopes by this means to compel the municipality to cause their construction all over the city.

Sanitary Inspectors' Examination.—The following candidates have passed the recent examination for sanitary inspectors under the Public Health (London) Act, 1891:—Mr. G. W. Adkins, Miss F. A. Baker, Miss M. E. Bibby, Miss H. M. E. Blackwell, Mr. S. T. Bocock, Miss J. J. Brown, Miss M. R. Burrows, Miss A. I. Cocksedge, Miss F. B. M. Ellis, Miss H. F. Ensor, Miss L. L. Ferard, Miss M. F. Hardcastle, Mr. P. A. Heath, Mr. S. R. Henderson, Miss O. C. M. Iles, Miss A. L. Jeffrey, Mr. W. C. Kelland, Miss G. Leaney, Miss F. N. F. Lovibond, Mr. G. Peverett, Mr. W. Rousell, Mr. W. J. Smith, Miss X. C. Turner and Miss I. D. Tyas.

The Special Annual Issue of "The Surveyor," dated January 31st, is a remarkably good one. It contains an interesting review of Municipal Engineering in 1901, dealing with municipal electrical undertakings, water supply, refuse destruction and utilization, sewage treatment, and streets and roads. A useful article on "The legal precedents of 1901 in relation to Municipal Engineering" is contributed by Mr. J. B. Reignier Conder, solicitor, and there is another on the legislation of 1901 in connection with this branch of engineering. There is an illustrated article on the Eastbourne Pier Enlargement and New Pavilion, but perhaps the most admirable feature is the forecast of municipal works projected by local authorities for 1902. There are many other items of interest in the number, which is published by the St. Bride's Press, Ltd, 24, Bride Lane, E.C. The price is 3d.

CURRENT MARKET PRICES.

		£	s.	d.	£	s.	d.
FORAGE.							
Beans	per qr.	1	10	0	—		
Clover, best	per load	4	15	0	5	10	0
Hay, best	do.	5	5	0	5	12	6
Sainfoin mixture	do.	4	10	0	5	5	0
Straw	do.	1	8	0	2	0	0
OILS AND PAINTS.							
Castor Oil, French ..	per cwt.	1	7	0	1	8	7
Colza Oil, English ..	do.	1	7	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	9	6	—		
Lead, white, ground, carbonate	do.	1	4	10	—		
Do. red	do	1	0	4½	—		
Linseed Oil, barrels ..	do	1	9	0	1	9	3
Petroleum, American ..	per gal.	0	0	6¾	0	0	7
Do. Russian ..	do.	0	0	5¾	0	0	6⅝
Pitch	per barrel	0	7	0	—		
Shellac, orange	per cwt.	6	0	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	12	6	1	13	0
Tar, Stockholm	per barrel	1	3	0	1	3	6
Turpentine	per cwt.	1	9	3	—		
METALS.							
Copper, sheet, strong ..	per ton	71	0	0	—		
Iron, Staffs., bar ..	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	0	0	—		
Lead, pig, Soft Foreign ..	do.	11	2	6	—		
Do. do. English common brands	do.	11	5	0	11	7	6
Do. sheet, English 3lb per sq. ft. and upwards	do.	11	17	6	—		
Do. pipe	do.	12	5	0	—		
Nails, cut clasp, 3in. to 6in.	per ton	9	0	0	—		
Do. floor brads	do.	8	15	0	—		
Steel, Staffs., Girders and Angles	do.	5	15	0	6	5	0
Do. do. Mild bars ..	do.	6	10	0	7	0	0
Tin, Foreign	do.	108	5	0	103	15	0
Do. English ingots ..	do.	111	0	0	112	0	0
Zinc, sheets, Silesian ..	do.	21	0	0	—		
Do. do. Vieille Montaigne	do.	21	10	0	—		
Do. Spelter	do.	17	7	6	17	10	0
TIMBER.							
SOFT WOODS.							
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec, Yellow ..	per load	4	7	6	6	0	0
Do. Pitch	do.	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	10
Do. Petersburg ..	per bundle	0	0	8½	0	0	8½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	22	0	0
Do. do. 4th & 3rd	do.	10	15	0	12	10	0
Do. do. unsorted	do.	5	12	6	6	10	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	10	0	16	5	0
Do. do. 2nd "	do.	16	0	0	—		
Do. do. White	do.	9	5	0	—		
Do. Swedish	do.	8	5	0	15	10	0
Do. White Sea ..	do.	10	10	0	11	15	0
Do. Quebec Pine, 1st ..	do.	15	15	0	26	5	0
Do. do. 2nd ..	do.	9	0	0	18	10	0
Do. do. 3rd &c.	do.	8	5	0	10	15	0
Do. Canadian Spruce, 1st	do.	7	10	0	9	5	0
Do. do. 3rd & 2nd	do.	7	5	0	9	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	0	0	12	10	0
Flooring Boards 1in. prepared, 1st ..	per square	0	10	3	0	12	3
Do. 2nd ..	do.	0	10	0	0	12	0
Do. 3rd &c. ..	do.	0	6	3	0	10	0
HARD WOODS.							
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	$4\frac{5}{32}$	—		
Do. Honduras ..	do.	0	0	1¾	—		
Do. Tobasco	do.	0	0	$2\frac{25}{32}$	—		
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	4⅞	—		
Do. African ..	do.	0	0	$2\frac{17}{32}$	—		
Do. St. Domingo	do.	0	0	5½	—		
Do. Tobasco ..	do.	0	0	4	—		
Do. Cuba ..	do.	0	0	$4\frac{1}{16}$	—		
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ..	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1	—		

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Feb. 13	Hastings—Matchboarding, Shelving, &c.	Workhouse Guardians	A. R. Inskipp, 11 Wellington Square, Hastings.
„ 13	Newborough, Anglesey—Public Hall, Library, &c.	—	R. L. Jones, 14 Market Street, Carnarvon.
„ 13	York—Isolation Hospital	Corporation	A. Creer, City Engineer, Guildhall, York.
„ 13	Cramlington—Twenty-seven Workmen's Houses	Co-operative Society	Secretary to Society, Cramlington.
„ 13	Woolwich—Bricks, Cement, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
„ 13	Halifax—Pair of Semi-detached Villas	—	R. Horsfall & Son, 22A Commercial Street, Halifax.
„ 13	Thomastown, Ireland—Repairs, &c., to Fever Hospital	Workhouse Guardians	L. Barry, Clerk, Workhouse, Thomastown.
„ 13	London—New Floors in Fever Hospital Ward	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„ 14	Aldreth—Bridge over West River	County Council	H. Leete, County Surveyor, Ely.
„ 14	Parkgate, near Rotherham—Working Men's Club	—	Garside & Pennington, Architects, Pontefract.
„ 14	Wolverhampton—Lime	Corporation	W. Clifford, Manager, Sewage Outfall Works, Wolverhampton.
„ 14	Catcliffe, near Rotherham—Playsheds, Latrines, &c.	School Board	J. Platts, Architect, High Street, Rotherham.
„ 14	Cupar-Fife—Semi-detached Villas	—	D. Storrar, Architect, Cupar-Fife.
„ 14	Kendal—Bath Pavilion at Sanatorium	Corporation	R. H. Clucas, Borough Engineer, Town Hall, Kendal.
„ 14	Preston—Re-roofing Baths, &c.	Corporation	Borough Surveyor, Town Hall, Preston.
„ 14	Sherborne, Dorset—Bridge	County Council	Surveyor to Urban District Council, Sherborne.
„ 15	Abersychan, Wales—Twelve Houses	Pontnewynydd Freehold Land, &c., Co.	W. S. Fletcher, Secretary, Crown House, Abersychan.
„ 15	Goole—House and Stables	W. T. Silvester	H. B. Thorp, Architect, Goole.
„ 15	Chelmsford—Twelve Cottages	Town Council	Borough Surveyor, 16 London Road, Chelmsford.
„ 15	Leadgate, Durham—House, Stable, &c.	R. Laidlaw	R. Laidlaw, Front Street, Leadgate.
„ 15	Leeds—Baths, Lavatory, Dormitories, &c.	—	T. Winn & Sons, 92 Albion Street, Leeds.
„ 15	Leeds—Extension and Alterations of Warehouses	D. Dixon & Son, Ltd.	T. Winn & Sons, 92 Albion Street, Leeds.
„ 15	Ballinard, Limerick—Creamery	Co-op. Agricultural & Dairy Soc., Ltd.	Secretary, Ballinutly, Culler, Tipperary.
„ 15	Pontypool—Volunteer Drill Hall	—	D. J. Lougher, Architect, Bank Chambers, Pontypool.
„ 17	Accrington—Shops, Offices, Stores & Assembly Rooms	Provident Co-Operative Society	Haywood & Harrison, Architects, Post Office Chambers, Accrington.
„ 17	Stamford—Engine-House, &c.	Corporation	J. B. Everard, 6 Millstone Lane, Leicester.
„ 17	Northwich—Building Materials, &c.	Weaver Navigation Trustees	J. A. Sauer, Engineer, Navigation Office, Northwich.
„ 17	Bootle, Lancs—Cement, Limes, Bricks, &c.	Corporation	Borough Engineer, Town Hall, Bootle.
„ 17	Todmorden—Retorts, Fire Bricks, &c.	Gas Committee	H. Hawkins, Engineer, Gasworks, Todmorden.
„ 17	Bargoed, Wales—School	Gelligaer School Board	James & Morgan, Architects, Charles St. Chambers, Cardiff.
„ 17	Halifax—Store Shed	Tramways and Electricity Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
„ 17	Whitehaven—Public Baths	Baths Committee	Borough Engineer, Town Hall, Whitehaven.
„ 18	Hurst, near Ashton-under-Lyne—Extensions at Police Station.	Standing Joint Committee	H. Littler, County Architect, County Offices, Preston.
„ 18	Heywood, Lancs—Fireclay Goods	Gas Committee	W. Whatmough, Gas Manager, Municipal Buildings, Heywood.
„ 18	Wrexham—Alterations, &c., to Market, &c.	Town Council	Borough Surveyor, Guildhall, Wrexham.
„ 18	London, E.—Block of Artizans Dwellings	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
„ 18	Bradford—Markets Extension	Corporation	T. C. Hope & Son, 23 Bank Street, Bradford.
„ 19	Southend-on-Sea—Cemetery Chapel	Church League	S. I. Adams, Architect, Weston Chambers, Weston Road, Southend.
„ 19	Torquay—Bricks, &c.	Water Committee	W. Ingham, Water Engineer, Torquay.
„ 19	Tyburn, near Birmingham—Bricks, Cement, &c.	District Drainage Board	J. D. Watson, Engineer to Board, Tyburn, near Birmingham.
„ 19	Ilkley—Bridge Works	Urban District Council	Surveyor, Council's Offices, Ilkley.
„ 19	Rastrick—Alterations, &c., to Schools	Brighouse School Board	B. Stocks, Architect, St. Peter's Street, Huddersfield.
„ 20	Carlisle—Temporary Wooden Bridge	—	H. C. Marks, 36 Fisher Street, Carlisle.
„ 20	Dromalane, Newry—24 Villa Residences	—	W. J. Watson, Benvenue, Rostrevor.
„ 20	Bradford—Mission Hall, &c.	—	W. J. Morley & Son, 259 Swan Arcade, Bradford.
„ 21	Croydon—Enlargement of Post Office	Commissioners of H.M. Works, &c.	Secretary, H.M. Office of Works, Storey's Gate, S.W.
„ 21	Garnfach, Nantyglo—School-room, alteration to Chapel, &c.	Primitive Methodist Connexion	Rev. S. Bryant, Worcester Street E., Brynmawr.
„ 22	Willenhall—Rebuilding Bridge	Urban District Council	T. E. Fellows, Council's Engineer, Town Hall, Willenhall.
„ 22	Ogmore Vale, Wales—School	Llangeinor School Board	T. J. Thomas, Architect, Bridgend.
„ 22	Pontardawe, Wales—Chapel	Wesleyan Connexion	W. W. Williams, 63 Wind Street, Swansea.
„ 22	Salisbury—Residence	R. Gerrish	F. Bath, Architect, Crown Chambers, Salisbury.
„ 22	Dublin—Bank House, Shop and Offices	Northern Banking Co., Ltd.	W. H. Stephens & Son, 13 Donegall Square North, Belfast.
„ 22	Holbeck, Leeds—Laundry, Wards, Lodge, &c.	Union Guardians	T. Winn & Son, 92 Albion Street, Leeds.
„ 24	Beckenham—Bricks, Cement, &c.	Urban District Council	Surveyor, Council Office, Beckenham.
„ 24	Sheffield—Bricks, Cement, Lime, &c.	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 24	Brockley, S.E.—Refreshment House	London County Council	General Section, Architect's Department, County Hall, Spring Gdns.
„ 24	Shoreditch—Four Blocks of Artizans' Dwellings	Borough Council	R. Plumbe, 13 Fitzroy Square, W.
„ 25	Walthamstow—Committee Room	Urban District Council	G. W. Holmes, Council's Engineer, Town Hall, Walthamstow.
„ 25	Devonport—Workmen's Dwellings	Borough Council	J. F. Burns, Borough Surv., Municipal Offices, Ker St., Devonport.
„ 25	Portsmouth—Alterations, &c., to School	School Board	A. H. Bone, Architect, Cambridge Junction, Portsmouth.
„ 25	Esher—Post Office	Commissioners of H.M. Works, &c.	Hunt & Steward, 45 Parliament Street, S.W.
„ 26	London, S.W.—Chimney Shaft	Fulham Board of Guardians	F. H. Medhurst, 13 Victoria Street, S.W.
„ 26	London, N.E.—Casual Wards, Laundry, &c.	Hackney Union Guardians	F. R. Coles, Clerk, Hackney Union, Homerton, N.E.
„ 26	Belfast—Technical Institute	Corporation	S. Stevenson, 83 Royal Avenue, Belfast.
„ 27	Canterbury—Underground Convenience	Corporation	A. C. Turley, City Surveyor, Tudor Chambers, Canterbury.
„ 28	Lurgan, Ireland—National School	Presbyterian Church Committee	H. Hobart, Architect, Dromore, co. Down.
„ 28	Helston—Police Station, &c.	Cornwall County Council	O. Caldwell, Architect, Victoria Square, Penzance.
March 3	Bracebridge, nr. Lincoln—Alterations, &c., to Asylum	Visiting Committee	Giles, Gough & Trollope, 28 Craven Street, Charing Cross, W.C.
„ 4	London, E.C.—Artizans Dwellings	Shoreditch Borough Council	H. M. Robinson, Town Clerk, Town Hall, Shoreditch, E.C.
„ 12	Dewsbury—Sixteen Houses	—	W. & D. Thornton, Architects, Oates Street, Dewsbury.
No date.	Fenny Stratford—Public Offices	Urban District Council	J. Chadwick, Architect, Bletchley, Bucks.
	ENGINEERING:		
eb. 13	Manchester—Condensers, &c.	Electricity Committee	F. E. Hughes, Secretary, Electricity Dep., Town Hall, Manchester.
„ 13	Leyton, Essex—Steam, Water, &c., Pipes	Electric Lighting Committee	Engineer, Electricity Works, Cathall Road, Leytonstone.
„ 15	Aberdeen—Electrical Equipment of Tramways	Tramways Committee	J. A. Bell, Engineer, Electricity Works, Cotton Street, Aberdeen.
„ 15	Guildford—Hot-water Services, &c.	Joint Hospital Board	E. L. Lunn, 36 High Street, Guildford.
„ 15	Isleworth—Laying Gas Pipes, &c.	Burial Board	Superintendent, Lodge, Isleworth Cemetery.
„ 15	Lancaster—Station Meter	Gas Committee	C. Armitage, Engineer, Gasworks, Lancaster.
„ 15	Langport, Somerset—Steam Drying Closet	Guardians	Master, Union Workhouse, Longport.
„ 15	Ayr—Quay Wall	Harbour Trustees	T. Meik & Sons, 29 St. Andrew Square, Edinburgh.
„ 15	Wokingham—Laying Water Mains	Rural District Council	J. F. Sargeant, 8 Shute End, Wokingham.
„ 17	Croydon—Electric Motor-cars	Town Council	E. W. Monkhouse, 14 Old Queen Street, Westminster, S.W.
„ 17	Bristol—Dock (30 acres)	Docks Committee	W. W. Squire, Engineer, Underfall Yd., Cumberland Basin, Bristol.
„ 17	London, E.C.—Widening London Bridge	Corporation	City Surveyor, Guildhall, E.C.
„ 17	Todmorden—Gasholder	Gas Committee	H. Hawkins, Engineer, Town Hall, Todmorden.
„ 17	Tyldesley, Lancs—Two Purifiers, &c.	Urban District Council	Mr. Gendall, Engineer, Gasworks, Tyldesley.
„ 17	Rhyl, Wales—Retort Bench	Gas Committee	L. G. Hall, Gas Engineer, Council Offices, Rhyl.
„ 18	Bromley Cross, Lancs—Widening Line	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
„ 18	Clifton Junction—Widening Line	Lancs and Yorks Railway Co.	Engineer, Hunt's Bank, Manchester.
„ 18	Bangor, Wales—Ammonia Still	Gas Committee	J. Smith, Engineer, Gasworks, Bangor, N. Wales.
„ 18	London—Steam Boilers	Holborn Union Guardians	J. Buley, Suffolk House, Laurence Pountney Hill, E.C.
„ 18	London, E.C.—175 Goods Waggons	Bengal-Nagpur Railway Co., Ltd.	Secretary 132 Gresham House, Old Broad Street, E.C.
„ 18	Isleworth—Boilers, Cooking Apparatus, and Laundry Machinery (3 Contracts).	Brentford Union Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
„ 19	Louvain, Belgium—Lighting City	—	Burgomaster, Louvain, Belgium.
„ 19	Bury—Laundry Plant, &c.	Health Committee	A. W. Bradley, Engineer, Corporation Offices, Bank Street, Bury.
„ 19	Clacton-on-Sea—Filters and Reservoir	Urban District Council	S. Francis, Engineer, Town Hall, Clacton-on-Sea.
„ 20	Liscard, Wallasey, Cheshire—Feed-Water Heater, &c.	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
„ 21	Walsall—Tramways	Corporation	R. H. Middleton, Borough Surveyor, Walsall.
„ 21	Bournemouth—Motor Generator	Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
„ 21	Glasgow—Switchboard Extensions	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 21	Criccieth, Wales—Extending Sewer Outfall	Urban District Council	M. Williams, Surveyor, Criccieth.
24	Bridgwater—Collecting Trenches, &c.	Rural District Council	T. M. Reed, Clerk, Bridgwater.
„ 25	Birkenhead—Machinery for Repair Shop	Tramways Committee	A. R. Fearnley, Tramways Manager, Sessions House, Birkenhead.
„ 26	Cannock—Water-supply Works	Rural District Council	W. E. Rogers, Engineer, Anson Street, Rugeley.
„ 26	London, S.W.—Electric Plant	Fulham Union Guardians	F. H. Medhurst, 13 Victoria Street, S.W.
„ 26	Derby—Boilers & Engineering Work at Public Baths	Corporation	J. Ward, Borough Surveyor, Babington Lane, Derby.
„ 26	Tooting Graveney, S.W.—Repairing, Draining, &c., Subways.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„ 28	Christiania—Swing Bridge	—	Ingenirvaabnets Kontor, Akershus Fæstning, Christiania.
„ 28	Linslade, Leighton Buzzard—Waterworks	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.
Mar. 4	Mountain Ash—Bridge	Urban District Council	J. Williams, Surveyor, Town Hall, Mountain Ash.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*continued.*		
Mar. 8	Sydney, N.S.W.—Bridge	Government of N.S.W.	D. J. Lougher, Engineer, Pontypool.
" 31	Rockhampton, Australia—Electric Tramways	Municipal Council	H. W. Johnson, Mayor, Municipal Chambers 'Rockhampton, Queensland.
	FURNITURE:		
Feb. 13	Carrick-on-Shannon—12 Iron Beds, &c	Guardians	A. O'Conor, Clerk, Workhouse, Carrick-on-Shannon.
	IRON AND STEEL:		
Feb. 13	Woolwich—Ironmongery, Sewer Ironwork, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 14	Christiania—Bar Iron for Locomotive Grates		Maskiningenioren, Kontor, Bispegaden, Christiania.
" 14	London, S.W.—Enamelled Iron Tablets	London County Council	Parks Department, 11 Regent Street, S.W.
" 15	Plymouth—Ironmongery, Ironwork, Bolts, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 15	Blackburn—Stores	Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
" 17	Bootle, Lancs—Stores and Materials	Corporation	Borough Engineer, Town Hall, Bootle.
" 17	Northwich—Stores	Weaver Navigation Trustees	J. A. Sauer, Engineer, Trustees Offices, Northwich.
" 17	London, S.W.—Steel Material	Uganda Railway Committee	Crown Agents for the Colonies, Downing Street, S.W.
" 18	Bury, Lancs—Iron Castings	Sewering, Paving and Streets Committee	A. W. Bradley, Engineer, Corporation Offices, Bank Street, Bury.
" 19	London, N.W.—Iron Castings, &c.	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead, N.W.
" 19	Plymouth—Fire Hydrants, &c., for Waterworks	Corporation	F. Howarth, Water Engineer, Municipal Offices, Plymouth.
" 19	Surbiton—Cast-iron Ironmongery, Ventilating Shafts	Urban District Council	J. Bell, Clerk, Council Offices, Ewell Road, Surbiton.
" 19	Tyburn, near Birmingham—Stores	District Drainage Board	J. D. Watson, Engineer to Board, Tyburn, near Birmingham.
" 19	Torquay—Ironmongery, Stop-cocks and Taps	Water Committee	W. Ingham, Water Engineer, Torquay.
" 20	Lancaster—Steel Roofs	Electricity Committee	J. Cook, Borough Surveyor, Town Hall, Lancaster.
" 24	Sheffield—Stores	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 25	Wembley, Middlesex—Ventilators, &c.	Urban District Council	C. R. W. Chapman, Surveyor, Public Offices, Wembley.
" 26	Linslade—C.I. Water Pipes, &c.	Urban District Council	Sands & Walker, Engineers, Angel Row, Nottingham.
" 27	London, N.—Manhole Covers, Gulley Grates, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
Mar. 3	London, N.W.—Smiths' Founders' Work, Ironmongery	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
April 14	Victoria, Australia—Steel Rails and Fishplates	Government	Agent-General for Victoria, 15 Victoria Street, S.W.
	PAINTING AND PLUMBING:		
Feb. 13	London, S.E.—Brushes, Oils, Colours, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Town Hall, Kennington Green, S.E.
" 14	Beverley—Painting, Colouring, &c.	Guardians	C. W. Hobson, Clerk, Workhouse, Beverley.
" 14	Preston—Painting, &c., at Baths	Corporation	Borough Surveyor, Town Hall, Preston.
" 14	Penzance—Painting Public Buildings	Corporation	F. Latham, Borough Engineer, Public Buildings, Penzance.
" 15	Plymouth—Paint, Glass, Brushes, &c.	Corporation	J. Paton, Borough Engineer, Plymouth.
" 15	Blackburn—Oils, Paints, Brushes &c.	Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
" 17	Northwich, Cheshire—Oils, Paints, Varnishes, &c.	Weaver Navigation Trustees	J. A. Sauer, Engineer, Trustees Offices, Northwich.
" 17	Plymouth—Lead Pipe, Pig Lead, &c.	Corporation	F. Howarth, Water Engineer, Municipal Offices, Plymouth.
" 19	Surbiton—Painting Lamp Columns, Ventilating Shafts	Urban District Council	J. Bell, Clerk, Council Offices, Ewell Road, Surbiton.
" 19	Torquay—Lead, Oils, Paints, &c.	Water Committee	W. Ingham, Water Engineer, Torquay.
Mar. 3	London, N.W.—Paints, Oils, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
	ROADS AND CARTAGE:		
Feb. 13	London, S.E.—Materials, Cartage, &c.	Lambeth Borough Council	H. Edwards, Borough Enginer, Town Hall, Kennington Green, S.E.
" 13	Woolwich—Road Materials, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 13	Wisbech—Materials	Rural District Council	J. H. Hunter, Highway Surveyor, Post Office Lane, Wisbech.
" 13	London, N.E.—Repair of Water Vans	Hackney Borough Council	N. Scorgie, Borough Surveyor, Town Hall, Hackney, N.E.
" 14	Aberford, near Leeds—Asphalt Footpath	Tadcaster Rural District Council	T. Scott, Surveyor, Aberford, Leeds.
" 14	Flaxton, near York—Whinstone	Rural District Council	J. Peters, 4 New Street, York.
" 14	Lancaster—Portland Cement	Tramways Committee	J. Cook, Borough Surveyor, Town Hall, Lancaster.
" 15	Plymouth—Road Metal, Brooms, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 15	Chelmsford—Team Labour	Essex County Council	P. J. Sheldon, Chief Surveyor, Duke Street, Chelmsford.
" 15	Bedford—Materials	County Council	County Surveyor, Shire Hall, Bedford.
" 15	Blackburn—Materials, &c.	Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
" 15	Eckington, Worcestershire—Burialground Works	Parish Council	J. Villar, 33 Cambray, Cheltenham.
" 15	Ayr—Roads	District Committee	A. Stevenson, 14 Cathcart Street, Ayr.
" 15	Bridgend, Glamorgan—Material and Haulage	County Council	T. Ll. Edwards, County Surveyor, Town Hall, Bridgend.
" 15	Ely—Broken Granite	Huntingdonshire County Council	H. Leete, County Surveyor, Ely, Cambs.
" 15	Milford Haven—Limestone	Urban District Council	T. H. Lewis, Clerk, Council Offices, Milford Haven.
" 15	Oswestry—Materials, &c.	Rural District Council	District Surveyor, Council Offices, Oswestry.
" 17	Old Hill, Staffs—Road Stone	Rowley Regis Urban District Council	D. Wright, Clerk, Council Offices, Old Hill.
" 17	East Retford—Granite	Corporation	J. D. Kennedy, Borough Surveyor, East Retford.
" 17	Liverpool—Road-making, &c.	Select Vestry	E. Kirby, 5 Cook Street, Liverpool.
" 17	Bristol—Paving	Sanitary and Improvement Committee	T. H. Yabbicom, 63 Queen Square, Bristol.
" 18	Long Sutton, Lincs—Granite and Slag	Urban District Council	S. S. Mossop, Clerk, Long Sutton.
" 18	Rochdale—Paving, Flagging, &c.	Paving, &c., Committee	S. S. Platt, Borough Surveyor, Town Hall, Rochdale.
" 18	St. Thomas, near Exeter—Materials, &c.	Rural District Council	A. E. Ward, 9 Bedford Circus, Exeter.
" 18	Bury, Lancs—Cement, Setts, Kerbs, &c.	Sewering, Paving and Streets Committee	A. W. Bradley, Engineer, Corporation Offices, Bank Street, Bury.
" 19	Surbiton—Materials, &c.	Urban District Council	J. Bell, Clerk, Council Offices, Ewell Road, Surbiton.
" 19	Greenwich—Stone	Borough Council	Borough Engineer, Town Hall, Greenwich Road, S.E.
" 19	Leeds—Tar Macadam	Corporation	City Engineer, Municipal Buildings, Leeds.
" 19	London, N.W.—Cartage, Materials, &c.	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead, N.W.
" 20	Horncastle, Lincs—Materials	Rural District Council	J. E. Chatterton, Clerk, Council Offices, Horncastle.
" 22	Ayr—Whinstone		A. Stevenson, 14 Cathcart Street, Ayr.
" 22	Lewes—Materials and Cartage	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
" 22	Belper—Material	Rural District Council	R. C. Cordon, Surveyor, Duffield, near Derby.
" 23	Lewes—General Team Labour	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
" 24	Sheffield—Stores, Materials, &c.	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 24	Beckenham—Team Labour, Materials, &c.	Urban District Council	Surveyor, Council Offices, Beckenham.
" 27	London, N.—Cartage, Materials, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
Mar. 3	London, N.W.—Cartage, Materials, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.
" 4	London, S.W.—Materials	Middlesex County Council	H. T. Wakelam, Surveyor, Middlesex Guildhall, Westminster, S.W.
" 4	London, S.W.—Cartage	Middlesex County Council	H. T. Wakelam, Surveyor, Middlesex Guildhall, Westminster, S.W.
" 5	South Shields—Materials	Corporation	S. E. Burgess, Borough Surveyor, Chapter Row, South Shields.
	SANITARY:		
Feb. 13	Woolwich—Drain Pipes, Disinfectants, &c.	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
" 13	London, S.E—Scavenging, Drain Pipes, &c.	Lambeth Borough Council	H. Edwards, Borough Engineer, Town Hall, Kennington Green, S.E.
" 15	Plymouth—Brooms, Disinfectants, &c.	Corporation	J. Paton, Borough Surveyor, Plymouth.
" 15	Blackburn—Pipes, Traps, Disinfectants, Sewerage and Drainage Works, &c.	Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
" 17	Bootle, Lancs—Pipes, Gulleys, Disinfectants, &c.	Corporation	Borough Engineer, Town Hall, Bootle, Lancs.
" 17	Kimberley, Notts—Sewering, &c.	Basford Rural District Council	S. Maylan, Surveyor, Public Offices, Basford.
" 17	Soothill Nether, Yorks—Sewage Works	Urban District Council	C. H. Marriott, Son & Shaw, Civil Engineers, Church Street Chambers, Dewsbury.
" 17	Stamford, Lincs—Sewers, &c.	Corporation	J. B. Everard, 6 Millstone Lane, Leicester.
" 18	Bury, Lancs—Sanitary Tubes, &c.	Sewering, Paving, &c., Committee	A. W. Bradley, Borough Engineer, Corporation Offices, Bank Street, Bury.
" 18	Shotley Bridge, Durham—Sewerage Works	Benfieldside Urban District Council	J. E. Parker, Engineer, Post Office Chambers, Newcastle-on-Tyne.
" 19	Dublin—Repairing Sewer, &c.	Rural District Council	T. J. Byrne, 1 James Street, Dublin.
" 19	Tyburn, near Birmingham	District Drainage Board	J. D. Watson, Engineer, Board's Offices, Tyburn, Birmingham.
" 19	Torquay—Earthenware Pipes, &c.	Water Committee	W. Ingram, Water Engineer, Torquay.
" 19	London, N.W.—Scavenging, Drain Pipes, Disinfectants	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead, N.W.
" 20	Aston Manor, Birmingham—Sewer	Urban District Council	Surveyor, Council House, Aston Manor.
" 20	Harbledown & St. Nicholas, Canterbury—Sewers, &c.	Bridge District Council	A. Bromley, Radnor Chambers, Folkestone.
" 24	London, N.—Sewer, &c.	Hornsey Urban District Council	E. J. Lovegrove, Engineer to Council, Southwood Lane, Highgate, N.
" 24	Sheffield—Lime, Pipes, Traps, &c.	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 26	Minworth & Cudworth, Birmingham—Sewerage Works	Castle Bromwich Rural District Council	Wilcox & Raikes, Union Chambers, 63 Temple Row, Birmingham.
" 27	London, N.—Sewers, Disinfectants, Drain Testers, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
Mar. 3	London, N.W.—Scavenging, Pipes, &c.	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	TIMBER:		
Feb. 13	Woolwich—Timber	Borough Council	F. Sumner, Borough Engineer, Maxey Road, Plumstead.
„ 15	Lancaster—Wood-paving Blocks	Streets Committee	J. Cook, Borough Surveyor, Town Hall, Lancaster.
„ 15	Blackburn—Timber	Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
„ 17	Bootle, Lancs—Timber	Corporation	Borough Engineer, Town Hall, Bootle.
„ 19	Tyburn, near Birmingham—Timber	District Drainage Board	J. D. Watson, Engineer, Board's Offices, Tyburn near Birmingham.
„ 19	London, N.W.—Timber, &c.	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead, N.W.
„ 24	Sheffield—Timber, &c.	Highway and Sewerage Committee ..	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 27	London, N.—Timber, &c.	Islington Borough Council	W. F. Dewey, Town Clerk, Town Hall, Upper Street, N.
Mar. 3	London, N.W.—Timber and Joinery Materials, &c. ..	St. Pancras Borough Council	W. N. Blair, Borough Surveyor, Town Hall, Pancras Road, N.W.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Feb. 15	Montrose—Ornamental Memorial Fountain	——	A. Middleton, Solicitor, Montrose.
„ 26	Kanturk, Ireland—Water-Supply Scheme	£20.	T. Guiney, Clerk, &c., Rural District Council, Workhouse, Kanturk.
Mar. 1	Aldershot—Laying-out Pleasure Ground	£20, £10, £5.	N. F. Dennis, Surveyor, Urban District Council, Offices Aldershot.
„ 5	New Malden, Surrey—Public Offices, Fire Station, Mortuary, &c.	£25, £10.	C. T. Lewis, Clerk, Maldens and Coombe Urban District Council, 7 Market Place, New Malden.
„ 14	Dunstable—Infectious Diseases Hospital	£5 5s.	C. C. S. Benning, Town Clerk, Dunstable.
„ 27	Sheffield—Union Offices	£25, £15, £10.	J. Smith, Clerk to Ecclesall Bierlow Union Guardians, The Edge, Sheffield.
„ 29	Aldershot—Public Offices, Fire Station and Town Hall	£100, £75, £50.	N. F. Dennis, Surveyor, Urban District Council Offices, Aldershot.
April 4	Langho, near Blackburn—Buildings for Colony for Epileptics, Imbeciles and Idiots.	£200, £150, £100.	H. Woodhouse, Clerk to Chorlton and Manchester Joint Asylum Committee, Chorlton Union Offices, All Saints, Manchester.
May 1	Melbourne, Victoria—Memorial Statue to Queen Victoria in Marble and Bronze.	——	Agent-General for State of Victoria, 15 Victoria Street, Westminster.
„ 14	Harrogate—Town Hall	£150, £100, £75.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.
June 30	Liverpool—Cathedral (Portfolios of Drawings or Designs in any Style to be submitted).	——	Hon. Secretary, Committee, Church House, South John Street, Liverpool.
Sept. 1-14	St. Petersburg—Bridges over Great Neva River	——	St. Petersburg Gorodskaja Uprawa, St. Petersburg.

COMING EVENTS.

Wednesday, February 12.

SANITARY INSTITUTE.—Mr. A. Wynter Blyth M.R.C.S., on "The Prevention of Small-Pox in the Metropolis," 8 p.m.—(Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, M.D., on "Sanitary Law," 7 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Annual Dinner at Queen's Hotel, Leeds.

INSTITUTE OF SANITARY ENGINEERS.—Mr. W. E. Markham on "The Application of Disconnection," 7 p.m.

SOCIETY OF ARTS.—Mr. W. Leonard Magden on "Industrial Redistribution and its connection with the Overcrowding Question," 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (BIRMINGHAM SECTION.)—Discussion on Dr. W. E. Sumpner's papers on "Alternate Current Diagrams" and "The Testing of Motor Losses." Prof. R. Threlfall. F.R.S., on "Electric Furnaces," 7.30 p.m.

Thursday, February 13.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. Charles M. Hadfield on "English Architecture of the Fifteenth Century," 6 45 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Prof. W. F. Barrett, F.R.S., and Mr. W. Brown, B.Sc. on "Researches on the Electrical Conductivity and Magnetic Properties of upwards of 100 different alloys of Iron," 8 p.m.

Friday, February 14.

PHYSICAL SOCIETY.—Annual General Meeting at 5 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. C. Hadfield, F.R.I.B.A., on "True Building."

ARCHITECTURAL ASSOCIATION.—Miss Ethel M. Charles, A.R.I.B.A., on "A Plea for Women Practising Architecture," 7.30 p.m.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley, M.D., on "Sanitary Law," 7 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. C. Johnston on "Some Public Health Aspects of the Question of Sewage Disposal," 8 p.m.

Saturday, February 15.

ARCHITECTURAL ASSOCIATION.—Second Spring Visit to Victoria and Albert Museum, by permission of Mr. Aston Webb, A.R.A., at 2 30 p.m.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Tenth Anniversary Dinner.

ROYAL INSTITUTION.—Lord Rayleigh on "Some Electrical Developments"—I., 3 p.m.

Monday, February 17.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. F. W. Bedford, F.R.I.B.A., on "Baldassare Peruzzi," 8 p.m.

LONDON INSTITUTION.—Mr. Edwin Freshfield, LL.D., F.S.A., on "Archæology in London as a Pastime for a busy man," 5 p.m.

ROYAL PHILOSOPHICAL SOCIETY OF GLASGOW (ARCHITECTURAL SECTION).—Professor Cooper, D D., on "An Early Description of an East Syrian Church with its connected buildings, from the recently published 'Testamentum Domini,' with some notices of the service at that time," 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Richard Holt on "Brickwork."

VICTORIA INSTITUTE.—Prof. Edward Hull, LL.D., F.R.S., on "The Physical History of the Norwegian Fjords," 4 p.m.

ROYAL ACADEMY.—Mr. Alfred Gilbert, R.A., on "Sculpture"—I. 4 p m.

SOCIETY OF ARTS (Cantor Lectures).—Mr. Cyril Davenport, F.S.A., on "History of Personal Jewellry from Prehistoric Times."

Tuesday, February 18.

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley on "Sanitary Law"—III.

INSTITUTE OF CIVIL ENGINEERS.—Discussion on Mr. George Cunningham Buchanan's paper on "The Port of Dundee," 8 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. Thomas E. Hudman on "American Georgian Architecture," 7.45 p.m.

NATIONAL REGISTRATION OF PLUMBERS (DISTRICT COUNCIL FOR CARDIFF, SOUTH WALES AND MONMOUTHSHIRE).—Mr. C. R. Williams on "Roof Water, and how to deal with it," 8 p.m.

Wednesday, February 19.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Meeting).—Mr. Robert F. Sherar on "Architectural Perspective."

SANITARY INSTITUTE (Lectures and Demonstrations for Sanitary Officers: Part I.).—Mr. J. Priestley on "Duties of a Sanitary Inspector: Outdoor," 7 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Mr. T. C. Gotch on "Robert Louis Stevenson from a Painter's Point of View," 7.45 p m.

CHEMICAL SOCIETY.—Meeting at 5.30 p m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p m.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CROYDON.—For highway improvements, Beddington, Coulsdon, &c., for the Rural District Council. Mr. R. M. Chart, surveyor, Town Hall, Croydon:—

W. Pearce	£10,525	W. Shepherd	£7,010
Fry Bros.	8,160	Streeter Bros.	6,697
Mowlem & Co.	8,098	Free & Sons	6,356
W. Langridge	7,380	East Acton Tar Paving Co....	6,329
Lawrence & Thacker ...	7,348	E. Iles	6,065
W. H. Wheeler	7,233		

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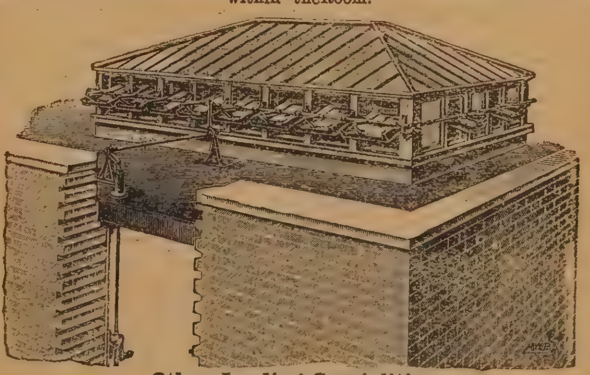

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TENDERS—*cont.*

AYLESBURY.—For extensions at the Bucks County Lunatic Asylum, Stone, near Aylesbury, for the Bucks County Council. Mr. R. J. Thomas, county surveyor, County Hall, Aylesbury. Quantities by Mr. G. H. Blatherwick, Nottingham:—

C. Miskin & Son, St. Albans	£58,900
J. Shillitoe & Son, Bury St. Edmunds	54,930
J. E. Johnson & Sons, Leicester	54,770
J. Parnell & Son, Rugby	53,059
H. Martin, Northampton	52,475
H. Willcock & Co., Wolverhampton	51,750
Webster & Cannon, Aylesbury	50,800
Benfield & Loxley, Oxford	50,498
W. Pattinson & Sons, Ruskington, Sleaford*	49,415

* Recommended for acceptance.

GREAT STANMORE (MIDDLESEX).—For the erection of an isolation hospital in Honey Pot Lane, Great Stanmore, for the Hendon Rural District Council. Mr. James A. Webb, surveyor, Great Stanmore:—

Maple & Co., Tottenham Court Road, W.	£9,889	0	0
T. Turner, Ltd., Cassiobury Mills, Watford	9,829	0	0
McCormick & Sons, Northampton Street, Essex Road, N.	9,312	0	0
Hardington & Elliott, Leicester	9,023	0	0
W. Bailey, Bushey Heath	8,900	0	0
H. Martin, Thenford Street, Northampton	8,778	0	0
R. L. Tonge, Jubilee Road, Watford	8,600	0	0
W. Tout, Brent Street, Hendon	8,446	19	9
Hardy & Sons, Palmers Green, N.	8,400	0	0
F. Dupont & Co., 3 Derby Road, Watford	8,370	3	8
Tyler & White, Watford	8,350	16	7
G. & J. Waterman, 103 High Street, Watford	8,267	0	0
Herbert Bros., Corporation Street, West Ham, E.	8,090	0	0
F. Gough & Co., Church Road, Hendon	7,984	0	0
A. G. Elson, Bushey Heath	7,347	7	7
E. Herbert, 29 Crescent Road, Upton Manor, E.	7,023	0	0
C. Brightman,* Watford	6,705	4	3

* Accepted. Roads and footpaths omitted.

GUILDFORD.—For the erection of a new corn exchange within the precincts of the cattle market in Woodbridge Road, for the Town Council. Mr. C. G. Mason, C.E., borough surveyor:—

R. Wood, North Street	£2,315	0
Heglett & Hammond, Friary Building Works	2,082	0
R. Smith, 1 Bury Fields	2,070	0
Tribe & Robinson, Stoke Fields	2,045	0
T. Swayne & Son, Stoke Road	2,035	0
Mussellwhite & Son, Cross Street, Basingstoke	1,937	0
Martin, Wells & Co., 133 Victoria Road, Aldershot	1,955	0
W. G. Edward, New Down Road, Merrow, near Guildford	1,947	0
W. Smith & Sons, Farnham Road	1,903	10
D. Fry, Bridge Street, Godalming	1,880	0
E. Chamberlain, Addlestone, Surrey	1,860	0
Newland & Higgs, Cobham, Surrey	1,747	0
S. Ellis, Chertsey Street	1,743	0
Mitchell Bros.,* Shalford, near Guildford	1,592	0

* Accepted. [Rest of Guildford.]

MITCHAM.—For the enlargement of the Lower Mitcham Schools, for the School Board. Mr. H. Carter Pegg, architect, Thornton Heath:—

C. Sayers	£3,010	14	9
E. J. Saunders	2,980	0	0
Hobbs Bros.	2,836	0	0
W. H. Parslow	2,797	8	7
Smith & Sons	2,742	0	0
Stewart & Sons	2,698	0	0
E. J. Burnand,* Wallington	2,695	0	0

* Accepted.

NANTWICH.—For the erection of a technical institute in Beam Street, Nantwich, for the Nantwich Urban District Council. Mr. C. E. Davenport, architect:—

J. Williams, Crewe	£2,696	0	0
H. Price, Shrewsbury	2,628	0	0
Cox & Vaughan, Nantwich	2,530	0	0
J. Stringer, Sandbach	2,468	0	0
Micklewright & Sons, Crewe	2,436	0	0
Stretton & Gibson, Crudlem, Nantwich	2,405	10	0
J. Morley, Crewe	2,402	11	0
S. Manley, Aston, Nantwich	2,315	0	0
Birchall Bros., Middlewich	2,296	16	6
F. Matthews,* Nantwich	2,195	0	0

* Accepted.

PENARTH (WALES).—For the following works in connection with the infectious diseases hospital at Llandough, for the Penarth Urban District Council. (Contract No. 1) construction of roads, footpaths, and sewers, and the erection of boundary walls, gates, &c.; (2) erection of buildings, comprising administrative block, fever wards block, isolation wards block, and laundry block. Mr. Edgar I. Evans, A.M.I.C.E., surveyor, Arcade Buildings, Penarth:—

Contract No. 1.

C. Beame & Nephew, Violet Road, Roath, Cardiff	£2,262	14	7
J. Allan, Cathays, Cardiff	2,108	4	7
E. R. Evans Bros., Gwenneth Street, Cardiff	1,917	17	9
J. Jones & Sons, Station Road	1,875	0	0
T. Rees, Crinalt, Ely, near Cardiff	1,851	17	10
J. E. Evans, Inverness Place, Cardiff	1,769	7	1
B. T. Pomeroy, Coldbrook Road, Cadoxton, Barry	1,733	2	5
D. G. Price, 7 Hickman Road	1,690	0	4
J. Prout, Barry	1,634	11	0
W. Britton, Court Road, Barry	1,572	8	4
Lloyd & Tape, Barry Dock	1,521	11	5
T. Bevan,* Albert Road	1,443	0	0

[Surveyor's estimate, £1,405.]

Contract No. 2.

J. E. Evans, Inverness Place, Cardiff	£6,000	0	0
J. Blight, Mallfant Street, Cardiff	5,984	18	2
J. Pickford, Bromfield Place	5,752	10	6
C. Beame & Nephew	5,522	13	4
J. Allan	5,516	3	6
J. Jones & Sons	5,309	10	0
E. R. Evans Bros.	5,308	18	8
J. Prout	5,285	0	0
W. Britton	5,123	6	3
D. Thomas & Son, 108 Richmond Road, Cardiff	5,103	0	0
D. G. Price	5,091	2	1
T. Bevan*	4,927	12	0
Lloyd & Tape	4,799	14	7

[Surveyor's estimate, £4,859 7s. 6d.]
* Accepted. [Rest of Penarth.]

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